

Dutta's

Bedside Clinics and Viva-Voce in Obstetrics & Gynecology



SIXTH EDITION

Hiralal Konar



Dutta's

BEDSIDE CLINICS AND VIVA-VOCE
IN
OBSTETRICS AND GYNECOLOGY

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BEDSIDE CLINICS AND VIVA-VOCE IN OBSTETRICS AND GYNECOLOGY

● **Sixth Edition 2016** ●

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The Health Sciences Publisher

New Delhi | London | Philadelphia | Panama



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Bedside Clinics and Viva-Voce in Obstetrics and Gynecology

Sixth Edition: 2016

ISBN 978-93-5152-976-7

Printed at

***Dedicated
to
the students
of
Obstetrics and Gynecology
(past and present)***

Preface

The examination system all over the world keeps on changing as science and technology continues to evolve and develop. The sole objective is 'improved patient care'. The current examination system is primarily aimed not only to evaluate the factual or theoretical knowledge, but also the conceptual understanding and the analytical power of the candidate. To qualify any examination system, besides the textbook knowledge, a candidate is expected to demonstrate the skills of clinical examination and data interpretation, the art of communication, decision-making and the management issues. With this sole determination the book "***Bedside Clinics and Viva-Voce in Obstetrics and Gynecology***" has been written.

This book is intended for the students at their final phase, while preparing for the examination. The book needs to be read and reread to develop a solid grasp of each topic as it contains a huge wealth of the new material. Repetition is the key-aid as the different topics are integrated.

Exhaustive **case discussions**, commonly presented in the **examination** (both in obstetrics and gynecology) have been made. All the chapters provide innumerable model answers which are framed in a simple, concise and easy-to-reproduce manner. **SBA**s and **MCQ**s are still the accepted modes of evaluation throughout the world. More than 600 MCQs have been discussed in the book. Current question papers of various universities have been solved. The explanatory notes with each SBA and MCQ are a guide to improve the analytical power of the student. Model answers are given for **Short Questions** to guide the students especially when the question needs justification (**Give reasons/Justify**) or **Critical Evaluation**.

Numerous (approximately 350) clinical photographs, sketches, boxes, tables, flow charts, partographs, cardiotocographs are incorporated to cope up with the need of the changing examination pattern.

Chapters on **Endoscopy** (Laparoscopy and Hysteroscopy) and **Robotic Surgery** in gynecology have been incorporated to keep the readers up-to-date with the progress of science and technology. Similarly, it is enriched with exhaustive number of **imaging studies** [Ultrasonograms, Doppler studies, Magnetic Resonance Imaging (MRI), Computed Tomography (CT) and good-quality skiagrams]. **Excellent quality colored photographs** of operative procedures, instruments, morbid specimens, and imaging studies are provided to build up the concept of such difficult areas. The presentation has been made lucid with easy-to-understand outline format. The **index** has been elaborated for ease of quick referencing. The book is primarily aimed to cover the **Indian system of examination (both the University and the National Board)**. With the growing demand, the current 5th edition has been thoroughly revised and updated to cover the **international examinations like the Royal College, London (RCOG), Royal College, Ireland (RCPI), and the American Board of Examinations (USMLE)**.

Bedside Clinics and Viva-Voce in Obstetrics and Gynecology is equally essential for the homeopathic, ayurvedic, and nursing students and also the midwives. The postgraduate students will find it informative and time-saving. Specialists and practitioners will be benefitted as they like to refresh and update their knowledge. It is a handy book that helps quick revision and memorization. It aims to sharpen the clinical skills as well as the art of communication.

Comprehensive knowledge is the domain of a textbook. But it is less likely seen a candidate translating the textbook knowledge into practice at the time of need, unless one trained specifically.

Above all, *Bedside Clinics* is an authoritative, evidence-based synoptic guide mainly for the clinical and viva-voce part of the examination.

I have aimed for brevity and clarity to make reading simple and enjoyable. **Chapter objectives** have been highlighted throughout the book. **Color codes** are used to make reading comfortable and for easy pick-up.

Key management points have been highlighted. Textbook references have been given for further study and clarification, especially for those who strive for excellence. Readers are requested to contact us (e-mail: h.kondr@gmail.com; website: www.hiralalkonar.com) for their opinions and views through the **students' forum** of the website.

I do hope this book will be of immense value to the students and the clinicians as ever. According to the author's desire, the book is dedicated to the **'Students of Obstetrics and Gynecology – Past and Present'**.

HIRALAL KONAR

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Acknowledgment

I am deeply indebted to all the teachers in this country and abroad for their guidance and support in the preparation of this book (to name a few, I will miss many!). The students from different medical colleges have provided many innovative ideas on how to enhance the book. I am especially indebted to all of them for their enthusiastic support. Their inputs have been invaluable and are sincerely appreciated. While writing such a book, I have consulted a multitude of eminent authors, related publications and many current evidence-based studies, recommendations and guidelines. I do sincerely acknowledge my legacy to all of them including the related authors and publishers.

I express my sincere thanks to Professor. S Banerjee, Director of Medical Education , WB, Professor (Mrs.) M. Ray, Principal, Professor P.B. Chakraborty, MSVP, Professor A. Biswas, Head of the Department, Obstetrics and Gynecology, Calcutta National Medical College and Hospital for their support. I am deeply indebted to Dr. A. Roy, Professor (Retd.), for his continued guidance and support while writing this book. Mrs. Madhusri Konar, MA, B Ed, needs special appreciation for her patient and sincere secretarial job as ever. Her hard work, sacrifice and devotion to continue her father's work is a special support to me.

The author expresses his sincere thanks to all the students (undergraduates and postgraduates), nursing staff, residents and the teachers of different medical institutions in this country and abroad for their views and suggestions (on e-mail id: h.kondr@gmail.com; and website: www.hiralalkonar.com).

I thank my colleagues who have generously provided many of the illustrations that appear in this edition. I am grateful to all my patients for their wholehearted support to enrich the book in the true sense of its title.

I am especially grateful to all those working for Jaypee Brothers Medical Publishers (P) Ltd, in particular, Dr. Sakshi Arora, Ms. Nitasha Arora and Ms. Sunita Katla for their expertise in editing, designing, shaping, collation, and expert proofreading. Md Jakir Hossain deserves special thanks for his hard work of initial composition that was done very carefully over the months.

Shri J.P. Vij (Group Chairman) and Mr. Ankit Vij (Group President), Jaypee Brothers Medical Publishers (P) Ltd. deserve special appreciation for their generous support to bring out this edition as per the international standard.

Acknowledgments to Teachers in the advisory board:

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List of Abbreviations Used

| | | | |
|-------|---|------|---|
| ABC | Airway, Breathing and Circulation | BV | Bacterial Vaginosis |
| AC | Abdominal Circumference | CCT | Controlled Cord Traction |
| ACE | Angiotensin II Converting Enzyme | COC | Combined Oral Contraceptive |
| ACTH | Adrenocorticotrophic Hormone | CPAP | Continuous Positive Airway Pressure |
| AFI | Amniotic Fluid Index | CPD | Cephalopelvic Disproportion |
| AFP | Alpha-fetoprotein | CPR | Cardiopulmonary Resuscitation |
| AIDS | Acquired Immunodeficiency Syndrome | CRL | Crown Rump Length |
| ALT | Alanine Transaminase | CS | Cesarean Section |
| AMH | Anti-Müllerian Hormone | CSF | Cerebrospinal Fluid |
| AMTSL | Active Management of Third Stage of Labor | CT | Computed Tomography |
| ANA | Antinuclear Antibody | CTG | Cardiotocography |
| ANC | Antenatal Check-up | CVA | Cerebrovascular Accidents |
| ANM | Auxiliary Nurse Midwife | CVP | Central Venous Pressure |
| APH | Antepartum Hemorrhage | CVS | Chorionic Villus Sampling |
| aPL | Antiphospholipid | CXR | Chest X-ray |
| APS | Antiphospholipid Syndrome | D&C | Dilatation and Curettage |
| APTT | Activated Partial Thromboplastin Time | D&E | Dilatation and Evacuation |
| ARM | Artificial Rupture of Membranes | DHT | Dihydrotestosterone |
| ART | Assisted Reproductive Technology | DIC | Disseminated Intravascular Coagulation |
| ART | Antiretroviral Therapy | DMPA | Depot Medroxy Progesterone |
| ASHA | Accredited Social Health Activist | DUB | Dysfunctional Uterine Bleeding |
| AST | Aspartate Aminotransferase (Aspartate Transaminase) | ECG | Electrocardiogram |
| BCG | Bacilli Calmette Guerin | ECP | Emergency Contraception Pill |
| b-hCG | Beta-human Chorionic Gonadotropin | ECV | External Cephalic Version |
| BMI | Body Mass Index | EDD | Estimated Date of Delivery |
| BP | Blood Pressure | EDF | End-diastolic Flow |
| BPM | Beats Per Minute | EEG | Electroencephalogram |
| BPP | Biophysical Profile | EFM | Electronic Fetal Monitoring |
| BSO | Bilateral Salpingo-oophorectomy | ERCS | Elective Repeat Cesarean Section |
| | | ERPC | Evacuation of Retained Products of Conception |
| | | ET | Embryo Transfer |
| | | FBC | Full Blood Count |
| | | FBS | Fetal Blood Sampling |
| | | FDPs | Fibrin Degradation Products |

| | | | |
|-------|---|---------|--|
| FGR | Fetal Growth Restriction | ICU | Intensive Care Unit |
| FHR | Fetal Heart Rate | IFA | Iron Folic Acid |
| FHS | Fetal Heart Sound | IPPV | Intermittent Positive Pressure Ventilation |
| FIGO | International Federation of Gynecology and Obstetrics | ITP | Idiopathic Thrombocytopenic Purpura |
| FMC | Fetal Movement Counting | IUCD | Intrauterine Contraceptive Device |
| FRU | First Referral Unit | IUD | Intrauterine Death |
| FS | Female Sterilization | IUFD | Intrauterine Fetal Death |
| GnRH | Gonadotropin-releasing Hormone | IUGR | Intrauterine Growth Restriction |
| GOI | Government of India | IUI | Intrauterine Insemination |
| GTD | Gestational Trophoblastic Disease | IUP | Intrauterine Pregnancy |
| GTN | Gestational Trophoblastic Neoplasia | IUS | Intrauterine System |
| HAART | Highly Active Anti-retroviral Therapy | IVF | Invitro Fertilization |
| Hb | Hemoglobin | IVF-ET | IVF and Embryo Transfer |
| HBsAg | Hepatitis B Surface Antigen | IVU | Intravenous Urogram |
| HBV | Hepatitis B Virus | JSY | Janani Suraksha Yojana |
| hCG | Human Chorionic Gonadotropin | LAM | Lactational Amenorrhea Method |
| HCV | Hepatitis C Virus | LAVH | Laparoscopically Assisted Vaginal Hysterectomy |
| HDU | High Dependency Unit | LDL | Low-density Lipoprotein |
| HELLP | Hemolysis, Elevated Liver Enzymes and Low Platelets | LH | Luteinizing Hormone |
| HIE | Hypoxic-ischemic Encephalopathy | LHV | Lady Health Visitor |
| HIV | Human Immunodeficiency Virus | LMP | Last Menstrual Period |
| HLD | High-level Disinfection | LMWH | Low Molecular Weight Heparin |
| hMG | Human Menopausal Gonadotropins | LNG | Levonorgestrel |
| HNPCC | Hereditary Nonpolyposis Colorectal Cancer | LNG-IUS | Levonorgestrel-releasing Intrauterine System |
| HPL | Human Placental Lactogen | LOD | Laparoscopic Ovarian Drilling |
| HPS | High Performing States | LPS | Low-performing States |
| HPV | Human Papilloma Virus | LSCS | Lower Segment Cesarean Section |
| HRT | Hormone Replacement Therapy | LSIL | Low-grade Squamous Intraepithelial Lesions |
| HSV | Herpes Simplex Virus | LUNA | Laparoscopic Uterine Nerve Ablation |
| ICSI | Intracytoplasmic Sperm Injection | MAP | Mean Arterial Pressure |
| ICTC | Integrated Counseling and Testing Center | MAS | Meconium Aspiration Syndrome |
| | | MCA | Middle Cerebral Artery |

| | | | |
|-------|---|-------|--|
| MCHC | Mean Corpuscular Hemoglobin Concentration | PNC | Postnatal Check-up |
| MCQ | Multiple Choice Question | PNDT | Prenatal Diagnostic Technique or Test |
| MIS | Minimally Invasive Surgery | POC | Products of Conception |
| MNM | Maternal Near Miss | POF | Premature Ovarian Failure |
| MMR | Maternal Mortality Ratio | PID | Pelvic Inflammatory Disease |
| MPA | Medroxyprogesterone Acetate | PFR | Pelvic Floor Repair |
| MRI | Magnetic Resonance Imaging | POP-Q | Pelvic Organ Prolapse-Quantification |
| MSAFP | Maternal Serum Alphafetoprotein | POPs | Progestogen Only Pills |
| MSU | Midstream Urine | PPH | Postpartum Hemorrhage |
| MTP | Medical Termination of Pregnancy | PPROM | Preterm Premature Rupture of Membranes |
| MVA | Manual Vacum Aspiration | PPTCT | Prevention of Parent-to-child Transmission |
| NGO | Nongovernmental Organization | PROM | Prelabor Rupture of Membranes |
| NICE | National Institute for Health and Clinical Excellence | PT | Prothrombin Time |
| NRHM | National Rural Health Mission | PTL | Preterm Labor |
| NSAID | Non-steroidal Anti-inflammatory Drugs | RCH | Reproductive and Child Health |
| NST | Non-stress Test | RCOG | Royal College of Obstetricians and Gynecologists |
| NSV | No-scalpel Vasectomy | RDS | Respiratory Distress Syndrome |
| NT | Nuchal Translucency | RCT | Randomized Controlled Trial |
| NTDs | Neural Tube Defects | RMI | Risk of Malignancy Index |
| OAB | Overactive Bladder | ROP | Right Occiput Posterior |
| OCP | Oral Contraceptive Pill | RR | Respiratory Rate |
| OGTT | Oral Glucose Tolerance Test | RTI | Reproductive Tract Infection |
| OHSS | Ovarian Hyperstimulation Syndrome | SAQ | Short-answer Question |
| P/V | Per Vaginam | SAMM | Severe Acute Maternal Morbidity |
| PCA | Patient-controlled Analgesia | SBA | Single Best Answer |
| PCOS | Polycystic Ovary Syndrome | SBA | Skilled Birth Attendant |
| PCR | Polymerase Chain Reaction | SCBU | Special Care Baby Unit |
| PEEP | Positive end-expiratory Pressure | SCC | Squamous Cell Carcinoma |
| PET | Positron Emission Tomography | SCJ | Squamo Columnar Junction |
| PFR | Peak Flow Rate | SERM | Selective Estrogen Receptor Modulators |
| PHC | Primary Health Center | SFH | Symphysis Fundal Height |
| PID | Pelvic Inflammatory Disease | SGOT | Serum Glutamic-oxaloacetic Transaminase |
| PMB | Postmenopausal Bleeding | SGPT | Serum Glutamic Pyruvic Transaminase |
| PMR | Perinatal Mortality Rate | SHBG | Sex Hormone-binding Globulin |
| PMS | Premenstrual Syndrome | | |

| | | | |
|---------|--|------|---|
| SLE | Systemic Lupus Erythematosus | TVS | Transvaginal Ultrasound |
| STD | Sexually Transmitted Disease | TVT | Tension-free Vaginal Tape |
| STI | Sexually Transmitted Infection | UAE | Uterine Artery Embolization |
| TAH/BSO | Total Abdominal Hysterectomy/Bilateral Salpingo-oophorectomy | UTI | Urinary Tract Infection |
| TBA | Thermal Balloon Ablation | VBAC | Vaginal Birth After Cesarean Section |
| TBA | Traditional Birth Attendant | VDRL | Venereal Disease Research Laboratory |
| TCRE | Transcervical Resection of the Endometrium | VIN | Vulval Intraepithelial Neoplasia |
| TDF | Testes-determining Factor | VLP | Virus-like Particles |
| TENS | Transcutaneous Electrical Nerve Stimulation | VTE | Venous Thromboembolism |
| TT | Tetanus Toxoid | VVF | Vesico Vaginal Fistula |
| TTP | Thrombotic Thrombocytopenic Purpura | vWF | Von Willebrand Factor |
| TLH | Total Laparoscopic Hysterectomy | VZIG | Varicella Zoster IgG |
| TTTS | Twin-to-twin Transfusion Syndrome | WHO | World Health Organization |
| | | ZDV | Zidovudine |

| OBSTETRICS AND GYNECOLOGY | | | | | | | | | | | |
|---|--------------------|-------------------------------------|------------------|-----------------------------|--|----------------------------------|-------------------------------------|--------------------------|------------------------|--|----------------------------------|
| MARKS DISTRIBUTION OF 3RD PROFESSIONAL MBBS PART-II EXAMINATION | | | | | | | | | | | |
| WEST BENGAL UNIVERSITY OF HEALTH SCIENCES : KOLKATA | | | | | | | | | | | |
| TOTAL MARKS = 200 | | | | | | | | | | | |
| 1 | | | | | | | | | TOTAL (100) | | |
| (A) THEORY | | PAPER 1 (40) | PAPER 2 (40) | TOTAL (Paper 1 + 2) (80) | | INTERNAL ASSESSMENT (IA) (20) | | | | | |
| (B) ORAL (30), CLINICAL (50) AND INTERNAL ASSESSMENT (20) = 100 | | | | | | | | | | | |
| | | OBSTETRICS TABLE VIVA = 20 | | | GYNECOLOGY TABLE VIVA = 10 | | | TOTAL 20 + 10 = 30 | CLINICAL = 50 | GRAND TOTAL (80) | |
| OBSTETRIC MANEUVER (5) | LOG BOOK (5) | OBSTETRICS VIVA VOCE = 10 | | | | GYNECOLOGY VIVA VOCE = 10 | | | | LONG CASE (OBST.) (30) | SHORT CASE (GYNE.) (20) |
| | | Instrument + Operative (3) | Specimen) (2) | X-Ray/ USG (2.5) | Recent Advances/ Problems (2.5) | TOTAL (10) | Instrument + Operative (3) | Specimen (2) | X-Ray/ USG (2.5) | Recent Advances/ Problems + Family Planning (2.5) | |
| | | | | | | | | | | | |

| MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES: NASHIK (MAHARASHTRA) | | | | | TOTAL MARKS = 200 | |
|---|--------------------------|--------------------|----------------------|-----------------------------|--------------------------------------|----------------|
| (A) THEORY | | PAPER 1 (40) | PAPER 2 (40) | TOTAL (Paper 1 + 2) (80) | INTERNAL ASSES- MENT (IA) (20) | TOTAL (100) |
| (B) ORAL (30), CLINICAL (50) AND INTERNAL ASSESSMENT (20) = 100 | | | | | | |
| OBSTETRICS TABLE VIVA | GYNECOLOGY TABLE VIVA | FAMILY PLANNING | CLINICAL | | INTERNAL ASSESSMENT | TOTAL |
| | | | Long case (OBST.) | Short case (GYNE.) | | |
| 10 | 10 | 10 | 40 | 10 | 20 | 100 |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|----------------|--|---------------------------|--|----------------------------|------------|-----------------------------------|--|---|--|--|--------------|-----------------|--|-------------------------|--|--------------|--|-------------------|--|-------------------|--|
| 3 | | | | | | | | | | ALL INDIA INSTITUTE OF MEDICAL SCIENCES : NEW DELHI | | | | | | | | | | TOTAL MARKS = 300 | | | |
| A. INTERNAL ASSESSMENT = 150 (continued assessment) | | | | | | | | | | | | | | | | | | | | | | | |
| B. EXTERNAL ASSESSMENT = 150 | | | | | | | | | | | | | | | | | | | | | | | |
| EXTERNAL ASSESSMENT 150 | | | | THEORY 75 | | | ORAL 30 | | | CLINICAL 45 | | | TOTAL 150 | | | | | | | | | | |
| (A) THEORY | | | | PAPER 1 = 38 | | | | | | | | PAPER 2 = 37 | | | | TOTAL (Paper 1+ 2) = 75 | | | | | | | |
| (B) ORAL (30); (C) CLINICAL (45) | | | | | | | | | | | | | | | | | | | | | | | |
| OBSTETRICS TABLE VIVA 10 | | | | GYNECOLOGY TABLE VIVA | | | | FAMILY PLANNING | | | | CLINICAL | | | | TOTAL | | | | | | | |
| | | | | | | | | | | | | OBST. CASE | | | | GYNE. CASE | | | | | | | |
| | | | | | | | | 10 | | | | 25 | | | | 20 | | | | | | | |
| | | | | | | | | | | | | | | | | 75 | | | | | | | |
| 4 | | | | | | | | | | | | RAJIV GANDHI UNIVERSITY OF HEALTH SCIENCES : KARNATAKA | | | | | | | | | | TOTAL MARKS = 500 | |
| (A) THEORY | | PAPER 1 100 | | PAPER 2 100 | | TOTAL (Paper 1 + 2) 200 | | | | INTERNAL ASSESSMENT (IA) 100 | | | | CLINICAL 160 | | VIVA 40 | | TOTAL 500 | | | | | |
| (B) INTERNAL ASSESSMENT (IA) | | | | CONTINUED IA THEORY 60 | | | | IA : CLINICAL AND PRACTICAL 40 | | | | TOTAL 100 | | | | | | | | | | | |
| (C) ORAL = (40), CLINICAL = (160) TOTAL = (200) | | | | | | | | | | | | | | | | | | | | | | | |
| OBSTETRICS TABLE VIVA 15 | | | | GYNAECOLOGY TABLE VIVA | | | | FAMILY PLANNING | | | | CLINICAL | | | | TOTAL | | | | | | | |
| | | | | | | | | | | | | Obst. case | | Gyne. case | | | | | | | | | |
| | | | | 15 | | | | 10 | | | | 80 | | 80 | | 200 | | | | | | | |

| 5 KERALA UNIVERSITY OF HEALTH SCIENCES : THIRUVANANTHAPURAM (KERALA) — TOTAL MARKS = 200 | | | | | |
|--|---------------|-----------------|---------------------------|--------------------------------|--------------|
| (A) THEORY | PAPER 1 40 | PAPER 2 40 | TOTAL (Paper 1 + 2) 80 | INTERNAL ASSESSMENT (IA) 20 | TOTAL 100 |
| (B) ORAL = 30, (C) CLINICAL = 50 (D) INTERNAL ASSESSMENT = 20 TOTAL : 100 | | | | | |
| OBSTETRICS VIVA | | GYNECOLOGY VIVA | CLINICAL | | TOTAL |
| | | | Obst. case | Gyne. case | |
| Log Book 10 | Viva 10 | 10 | 25 | 25 | 100 |

| 6 RANI DURGABATI UNIVERSITY OF HEALTH SCIENCES : JABALPUR (M.P) — TOTAL MARKS = 200 | | | | | |
|---|--------------------------|--------------------|-----------------------------|----------------------------------|----------------|
| (A) THEORY | PAPER 1 (40) | PAPER 2 (40) | TOTAL (Paper 1 + 2) (80) | INTERNAL ASSESSMENT (IA) (20) | TOTAL (100) |
| (B) ORAL (40), CLINICAL (40) AND INTERNAL ASSESSMENT (20) TOTAL : 100 | | | | | |
| OBSTETRICS VIVA TABLE | GYNECOLOGY VIVA TABLE | FAMILY PLANNING | CLINICAL | | TOTAL |
| | | | Obst. case | Gyne. case | |
| 15 | 15 | 10 | 25 | 15 | 100 |

SECTION

1

OBSTETRICS

- **History Taking and Clinical Examination**
- **Obstetric Case Discussions**
- **Single Best Answer and Multiple Choice Questions**
- **Labor and Delivery**
- **Active Management of Labor**
- **Obstetric Short Questions**
- **Operative Obstetrics**
- **Practical Obstetrics**
- **Maternal Health—Global Scenario and India**
- **Drug Therapy, Teratogenicity, Charts, Illustrations and Medications**

Chapter Objectives

Good knowledge and understanding to demonstrate:

- Clinical skills
- Communication skills
- Review of the physical signs based on physiology/pathology
- Identification of risk factors
- Ability to organize investigations

Different Gadgets Used in the Antenatal Clinic to Assess Maternal Health and Fetal Wellbeing



Fig. 1.1: Weight and height measurement tools



Fig. 1.2: Stethoscope



Fig. 1.3: Women with their records, waiting for prenatal check up

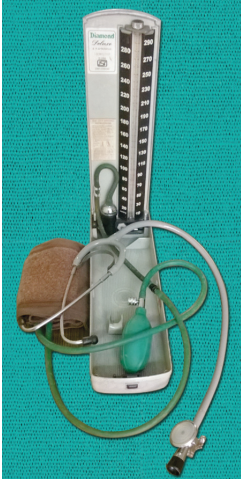


Fig. 1.4: BP apparatus



Fig. 1.5: Doppler



Fig. 1.6: USG machine

CHAPTER

1

History Taking and Clinical Examination

PATIENT PARTICULARS

Name: Mrs.....

Age: years

Address:

Occupation:

• Religion:

Educational status:

• Occupation of the husband:

Duration of marriage:

• Socioeconomic status:

Gravida:

• Date of admission:

Parity:

• Date of examination:

LMP..... EDD Period of gestation in weeks.....

Chief complaints: Pain abdomen/headache/vaginal bleeding/urinary problems are to be recorded, in order of priority or by chronological onset of events. Some patients may not have any complaints but have been admitted due to some significant observation like raised blood pressure (BP), or for investigations and planning mode of delivery as in a case with Rh-isoimmunization or pregnancy with prior cesarean delivery.

History of present illness: Elaboration of the chief complaints as regard to their onset, duration, severity, use of medications, investigations, and progress, is to be made.

History of present pregnancy: Important complications of different trimesters of the present pregnancy (if any) are to be recorded carefully. Number of antenatal visits (booking status), immunization status, intake of iron and folic acid are to be recorded. Any medication or radiation exposure in early pregnancy or medical/surgical events during pregnancy should be enquired and recorded. Woman's perception of fetal movements may be mentioned.

Obstetric history: Previous obstetric events are to be recorded chronologically. This is relevant in a multigravida. The obstetric history is summed up as gravida....., para....., miscarriage....., MTP..... and living issue.....

Menstrual history: Menarche (age).....years, cycle 28–30 days, duration 3–4 days; amount of flow: (average/scanty), dysmenorrhea (if any). LMP.....EDD..... (Naegele's formula); period of gestation..... weeks.

Past medical history: Any relevant past medical illness (malaria and jaundice).

Past surgical history: Previous surgery—general (appendicectomy) or gynecological (myomectomy).

Family history: Hypertension, diabetes, hemoglobinopathy, twinning or congenital malformation or consanguineous marriage is to be enquired and recorded.

Personal history: Contraceptive practice, smoking, chronic medications (corticosteroids), habit forming drugs are to be enquired. Sleep, appetite, bowel and bladder habits are to be mentioned.

EXAMINATION

■ General survey

- Build
- Nutrition
- Height (Fig. 1.1)
- Weight (Fig. 1.1)
- Pallor
- Jaundice
- Cyanosis
- Tongue, teeth, gum and tonsils
- Neck veins
- Neck glands
- Thyroid
- Breasts
- Pulse
- Blood pressure
- Temperature
- Respiratory rate
- Edema legs

■ Mental status

To assess whether the individual is alert, conscious and co-operative.

■ Systemic examination

- ❖ Examination of cardiovascular and respiratory system
 - Heart
 - Lungs
- ❖ Musculoskeletal system
- ❖ Examination of abdomen
 - Inspection
 - Palpation

Any tenderness, liver, spleen (any organomegaly)

❖ Obstetric examination:

- Palpation
- Obstetric grips
- Percussion (not done)
- Auscultation for fetal heart sound

OBSTETRIC EXAMINATION

Preliminaries: (a) Verbal consent from the patient should be taken, (b) presence of a female attendant, (c) prior bladder evacuation, (d) proper exposure of abdomen, (e) woman in dorsal posture with thighs and knees slightly flexed (Fig. 1.7), (f) the candidate is to stand on the right side of the patient.



Fig. 1.7: Patient's position during obstetric examination

EXAMINATION PROPER

A. Inspection: Enlargement of the abdomen; uterine shape — ovoid (longitudinal/transverse); contour of uterus — smooth or any fundal notching.

Skin condition: Presence of linea nigra (Fig. 1.8), striae gravidarum, umbilicus (everted), presence of any scar mark, infection (scabies, if present) venous prominence, visible fetal movements, etc.



Fig. 1.8: Skin changes during pregnancy showing linea nigra and striae gravidarum



Fig. 1.9: Palpation of the height of the (centralized) uterus with the ulnar border of the left hand

B. Palpation: Centralization of the uterus should be done (Fig. 1.9).

(a) Height of the uterus in terms of weeks (Fig. 1.9)

(b) Symphysiofundal height in cm (Fig. 1.10)



Fig. 1.10: Teacher demonstrates symphysiofundal height measurement
[By courtesy: Prof. B N Chakraborty, Director, IRM, Calcutta]

(c) **Obstetric grips** (Leopold's maneuvers):

- i. First Leopold (fundal grip)
- ii. Second Leopold (lateral or umbilical grip)
- iii. Third Leopold (Pawlik's grip)
- iv. Fourth Leopold (pelvic grip).

For methods of examination, observation and inference, see Dutta obs 8/e, p 87.

C. Auscultation of fetal heart sound using a stethoscope or Doppler (along the spinoumbilical line in case of cephalic presentation).

Summary of the case: A case summary is to be made mentioning the age, parity, period of gestation, highlighting in brief the important and relevant information in the history, general physical examination and obstetric examination (obstetric palpation and auscultation). See case 1.

Provisional diagnosis: A provisional diagnosis is to be made and written in few lines mentioning the woman's age, parity, gravida, period of gestation and the complication (if any) in pregnancy.

Suggested investigations: (a) Routine antenatal investigations (Dutta obs 8/e, p 110). and (b) investigations relevant in the given case for diagnosis and/or management.

Differential diagnosis: Where applicable.

NORMAL PUERPERIUM

HISTORY TAKING AND CLINICAL EXAMINATION

The basic format is more or less same as in an antenatal case.

Points of difference are:

- A. Instead of recording the LMP—mention the date and time of childbirth.
- B. Instead of EDD and period of gestation—mention the number of days in puerperium.
- C. Chief complaints should be highlighted, the problems of puerperium (e.g. pain abdomen, pain perineum, breast problems, urinary problems, etc.) only.
- D. History of present illness: Elaboration of chief complaints (mentioned in 'C') as discussed in an antenatal case, e.g. pain abdomen starts since the time of delivery. The pain is mild in nature at times spasmodic. Pain located in the perineum, specially over the area of episiotomy. The lochial discharge is normal. It is bright red in color. She changed 3–4 pads in the last 12 hours. Pads are partly soaked. Her pain has improved as she has taken some medicine (analgesic—ibuprofen).
- E. Instead of "History of Present Pregnancy" mention in brief the history of preceeding pregnancy (e.g. Mrs. CR was admitted in the hospital last evening at about 7 pm with labor pain following a term pregnancy. She was a booked case in this hospital. Her course in pregnancy in all the trimesters were uneventful. She had a spontaneous vaginal delivery with right mediolateral episiotomy onat.....am/pm. The total duration of labor was 5 hours. She had uneventful third stage of labor.

Rest of history (past, family, obstetric, etc.): Same as that of an antenatal case.

Examination:

- A. **General survey:** Record of temperature is important, besides the other (BP, etc.) parameters mentioned in an antenatal case (p. 3-4).
- B. **Examination of chest:** For **cardiovascular system** and **respiratory system** are same as in an antenatal case.
- C. **Breast examination:** To enquire about breast problems (pain and lactation difficulty) breast examination is needed (in the presence of a female attendant).
- D. **Palpation (abdomen)** for any tenderness and organomegaly (liver/spleen) is done.
- E. **Obstetric palpation:** Preliminaries are same as in an obstetric case.
 - (i) Measuring the height of the uterus (bladder should be empty and uterus must be centralized). It is expressed in relation to the level of umbilicus.
 - (ii) Symphysiofundal height measurement (in cm).
 - (iii) Palpation of the uterus to note tenderness, surface irregularity, mobility and palpation for any other abdominal mass (ovarian) is done (obstetric grips and auscultation are not applicable here).

HISTORY AND EXAMINATION OF THE BABY



Fig. 1.11: Mother in second day of normal puerperium with baby

A: (i) Birth — Date and time, (ii) Apgar score (cried at birth), (iii) weight, (iv) passage of urine and meconium and (v) breastfeeding.

B: Examination: (i) Skin color, (ii) respiration, (iii) jaundice, (iv) head, (v) chest, (vi) heart and lungs, (vii) abdomen, (viii) umbilicus (any discharge, infection), (ix) genitalia, (x) anus, (xi) any congenital malformation such as limbs, digits, etc. (xii) gestational age (term/preterm).

Summary of the case: (Case 3) p. 29.

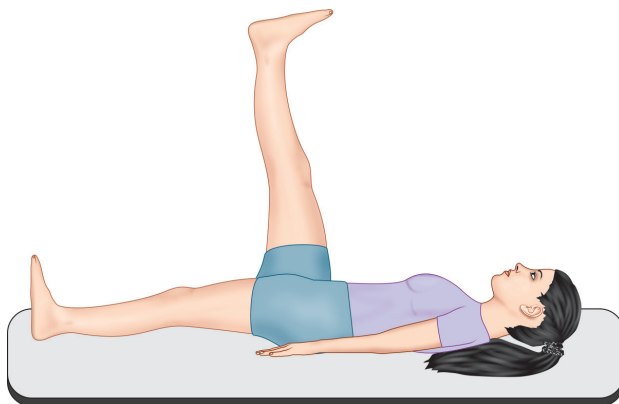
Mrs. 22 years, P1+0+0+1, delivered vaginally in this hospital following a term pregnancy. Live baby boy/girl was born on at Mrs ... has got mild pain in the abdomen and the perineum. On examination she is afebrile, uterine fundus is at the level of umbilicus (..... cm above the symphysis pubis) and the episiotomy wound is healthy. Lochial discharge is normal. Bladder function is normal (she has passed urine).

Baby cried at birth. Baby on examination is found to be a term one, normal and is on breast milk.

Provisional diagnosis: Mrs....., 22 years old, P1+0+0+1 with a term healthy baby girl, 2.7 kg, delivered on..... date..... She is on the second day of **normal puerperium** (Fig. 1.11).

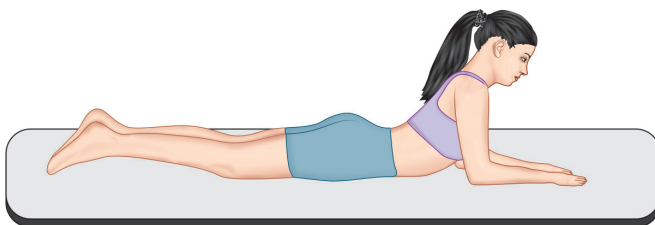
POST-PARTUM EXERCISES

Fig. 1.12: Straight Leg Raising



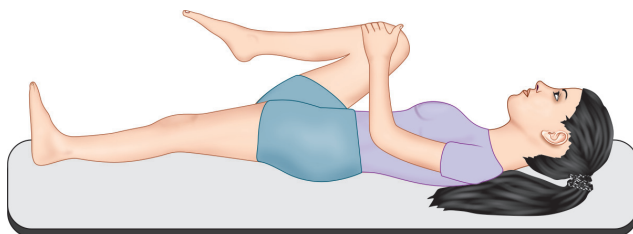
To lie on the back and put knees straight and hands by the side. Raise one leg slowly with knee extended and hip (hip at 90° to the upper body). Repeat with the other leg and then with both the legs.

Fig. 1.13: Exercise for the Back

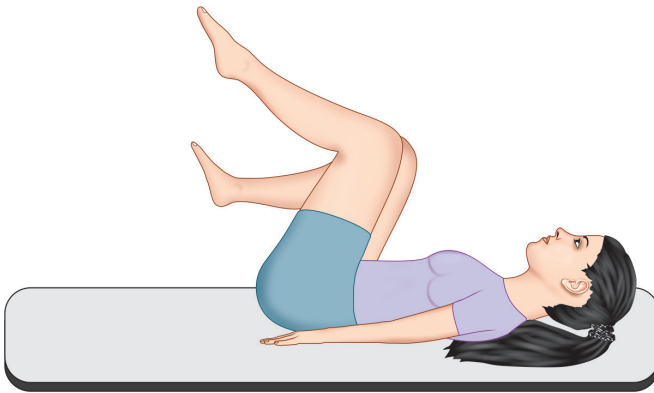


To lie on the stomach. Keep the forearms with elbows down on either side of the head on the bed. To raise the head and the shoulders as much as possible with weight on elbows.

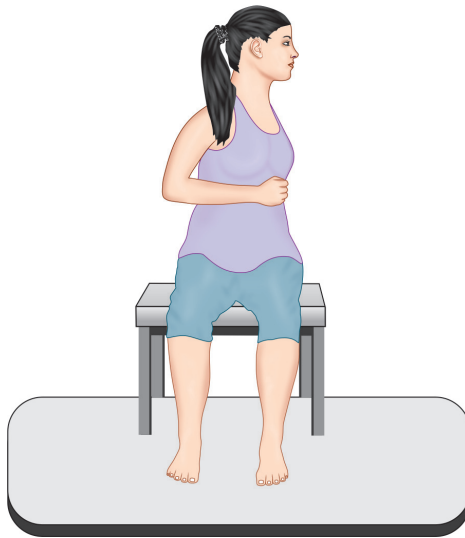
Fig. 1.14: Knee Chest Exercise



To lie on the back. Slowly lift one leg with knee flexed. With the help of the hands, the knee is pulled over the chest. The other leg to be flat on the bed. Repeat the same with other leg and then with both the legs.

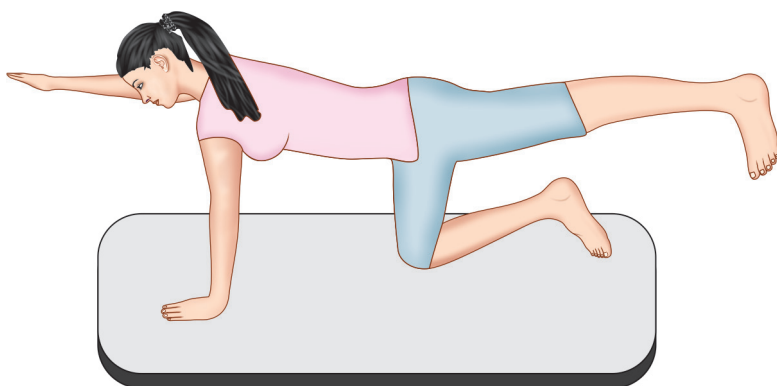
Fig. 1.15: Leg Cycling Exercise

To lie on the back with hands by the side. In a very relaxed manner get both knees to chest and then stretch the legs out as long and straight as possible. Keep toes pointed. Move the legs in a cycling motion. Movements are made slowly, not in speed.

Fig. 1.16: Trunk Rotation Exercise

To sit on a stool with thighs well supported, and hip and knees at 90° . To rotate the trunk on either side alternately and try to get chest and both elbows rotate to the opposite side.

Fig. 1.17: Spine and limbs stretching



To be on fours. To stretch opposite limbs (hand and leg) keeping other limbs (hand and leg) on the ground and to do alternatively.

SPACE FOR NOTES

CHAPTER

2

Obstetric Case Discussions

Case-1

Normal Pregnancy

Case-2

Primigravida with Floating (Free) Head at Term

Case-3

Normal Puerperium

Case-4

Puerperium Normal and Abnormal

Case-5

Pregnancy and Labor in a Woman with Prior Cesarean Delivery

Case-6

Anemia in Pregnancy

Case-7

Diabetes in Pregnancy

Case-8

Breech Presentation

Case-9

Prolonged Pregnancy (Postdated Pregnancy)

Chapter Objectives

To demonstrate the knowledge and understanding of:

- Physiological adaptation in pregnancy
- Obstetric problems (APH, FGR, PPH, etc.)
- Maternal medicine:
 - Hematological diseases (anemia)
 - Hypertension
 - Seizure disorders
 - Diabetes, etc.
- Maternal and fetal complications
- Puerperium normal and abnormal
- Modalities of investigations and interpretation of results

- Case-10** Fetal Growth Restriction (FGR)
- Case-11** Pre-eclampsia and Eclampsia
- Case-12** Pregnancy in a Rhesus Negative Woman
- Case-13** Multiple Pregnancy
- Case-14** Intrauterine Fetal Death (IUFD)
- Case-15** Polyhydramnios
- Case-16** Antepartum Hemorrhage
- Case-17** Abruptio Placenta (Accidental Hemorrhage)
- Case-18** Postpartum Hemorrhage (PPH) - Prevention and Management
- Case-19** Hemorrhage in Early Pregnancy
- Case-20** Miscarriage (Spontaneous Abortion)

OBSTETRIC CLINICAL EXAMINATION



Fig. 2.1: Measurement of height of a pregnant woman



Fig. 2.2: Measurement of weight



Fig. 2.3: Measurement of blood pressure



Fig. 2.4: Procedure of fetal heart sound auscultation

OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE)

CASE-1

NORMAL PREGNANCY

Case Summary

Mrs MR, aged 26 years in her first pregnancy (P0+0+0+0), is admitted at 39 weeks of gestation with pain in the back. She is a booked case and has regular antenatal supervision. She is immunized and has received iron and folic acid supplementation throughout. All the trimesters of her pregnancy were uneventful.

On General Physical Examination (GPE), she is of 5'3" height, without any pallor, no edema, BP 120/80 mmHg and otherwise fit and healthy. She has gained total 11 kg of weight in this pregnancy. **Systemic examination** revealed, normal cardiovascular and respiratory systems. **Obstetric examination** revealed, uterus term size and relaxed, SFH 38 cm. Single fetus, longitudinal lie, cephalic presentation, 3/5th of the head is palpable P/A. Fetal back is on the left side. Limbs are on the right side. Liquor volume is adequate. On auscultation FHS is heard on the left spinoumbilical line, 148 beats per minute and is regular.

Q. What is your provisional diagnosis?

Ans. Mrs MR, aged 26 years, a booked primigravida (P0+0+0+0) at term in her normal pregnancy.

Q. Why do you present her as a case of normal pregnancy?

Ans. ☐ From history she has no major symptoms except the mild backache which is common in pregnancy.
☐ On examination she has got no pallor, she is well-nourished, weight gain in pregnancy is normal and she is normotensive.
☐ On systemic examination there is no abnormality.
☐ Obstetrical examination revealed no abnormality.

Q. Why do you call her a booked case?

Ans. Any woman who has been supervised (examined and advised) during pregnancy in an institution at least three times.

Q. What investigations are commonly advised to a pregnant woman in the antenatal clinic?

Ans. i. Blood for Hb%, ABO, Rh grouping, VDRL, and blood glucose estimation is done.
ii. Urine for routine and microscopic (protein, sugar, and pus cells) examination.
iii. Cervical cytology screening.

Special investigations:

- iv. Serological tests for rubella, hepatitis B virus, and HIV (with consent).
- v. Maternal serum alpha fetoprotein (MSAFP) or triple test for prenatal diagnosis of fetal malformation (Dutta Obs 8/e, p 128).
- vi. Ultrasound examination in the first trimester and/or routine anomaly scan at 18–20 weeks.

Q. How often should a woman be examined in the antenatal clinic?

Ans. Generally a pregnant woman is seen at an interval of 4 weeks upto 28 weeks, at interval of 2 weeks upto 36 weeks and thereafter weekly till the expected date of delivery. However, **WHO recommends** at least four visits; **first** around 16 weeks, **second** between 24 and 28 weeks, the **third** at 32 weeks and the **fourth** visit at 36 weeks.

Q. What are the objectives of subsequent visits in the antenatal clinic?

Ans. To detect any high-risk factor from the history, examination and investigations, each time she attends the clinic. Repeated examinations help to detect any onset of anemia, pre-eclampsia. Assessment of fetal growth and fetal well-being are done. Fetal number, lie, presentation, position and liquor volume are also assessed.

Q. Name the vaccines which are contraindicated in pregnancy?

Ans. Live virus vaccines (rubella, measles, mumps, varicella, yellow fever) are contraindicated.

Every pregnant woman should be immunized against tetanus.

Q. What are the causes of edema in pregnancy? How is physiological edema differentiated from the pathological one?

Ans. Causes of edema are:

- i. Physiological, ii. pre-eclampsia, iii. anemia, hypoproteinemia, iv. cardiac failure, and v. nephrotic syndrome.

The features of physiological edema are:

- i. Usually mild and in one leg (Fig. 2.5).
- ii. Disappears on rest.
- iii. Not associated with other features of pre-eclampsia, e.g. hypertension or proteinuria.
- iv. Not associated with any other pathology (e.g. cardiac, renal or hematological).



Fig. 2.5: Pitting edema of the leg over the ankle

Q. How do you measure symphysiofundal height (SFH) and what is its importance?

Ans. The woman is asked to empty her bladder. The top of the centralized uterine fundus is measured from the superior border of the symphysis pubis with a measuring tape. The SFH measured in cm normally corresponds to the period of gestation in weeks. This is applicable after 24 weeks of pregnancy only. It is a good screening method (Figs 2.6 and 2.8).

Q. What are the information that can be obtained from the pelvic grips?

Ans. Pelvic grips are two — Pawlik's grip and pelvic grip. Otherwise these are known as Leopold third and fourth maneuver.

Information obtained are:

- i. **Presentation** (cephalic, breech or others)
- ii. **Presenting area** (vertex, face, or others)
- iii. **Attitude** (flexion or extension)
- iv. **Engagement** (by palpating the sincipital and occipital poles in cephalic presentation).

Q. What is a booking scan and what are the advantages?

Ans. Ultrasound examination of the fetus at 18–20 weeks has got many advantages. Detailed fetal anatomy, viability, number of fetuses liquor volume and placental localization can be assessed.

Q. What investigations are repeated on subsequent antenatal visits?

Ans. Hemoglobin at 28th and 36th weeks. Urine is tested for protein, sugar, and nitrites (dipstick) at every visit (Fig. 2.7).



Fig. 2.6: Centralization of the uterus and measuring the height of the centralized uterus



Fig. 2.7: Dipstick test



Fig. 2.8: Measurement of the symphysiofundal height with a tape

Q. How do you auscultate the fetal heart sound (FHS)?

Ans. In cephalic presentation, it is heard by placing the fetoscope or the bell of the stethoscope on the spinoumbilical line depending on the side where the fetal back is. In breech presentation FHS is best heard at or above the level of umbilicus. It may be on the right or left depending upon where the fetal back is (Fig. 2.9). In shoulder presentation (transverse lie) FHS is heard either at or below the level of umbilicus in the midline. In occiputoposterior position, it is more towards the flank and is difficult to locate.

Q. Who need routine tests for blood glucose during pregnancy?

Ans. (i) Positive family history of diabetes, (ii) previous birth of a baby weighing > 4 kg, (iii) unexplained intrauterine fetal death in late pregnancy, (iv) persistent glycosuria, (v) obesity, and (vi) age over 30 years.

Q. What are the different methods that can help to estimate the gestational age and predict the expected date of confinement?

Ans. Gestational age is about 280 days calculated from the first day of LMP.

- i. **Naegele's formula** — adding 9 calendar months and 7 days to the first day of last normal menstrual period (LMP).



Fig. 2.9: Auscultation of the FHS (using a stethoscope) over the right spinoumbilical line

- ii. **Date of fruitful coitus** — if this date can be remembered, 266 days are to be added to this date.
- iii. **Date of quickening** — to add 22 weeks in a primigravida and 24 weeks in a multipara to this date of quickening.
- iv. Review of **previous antenatal records** and to add the required weeks to make it 40 weeks.
 - a. Size of the uterus before 12 weeks (clinical examination).
 - b. Record of positive pregnancy test at first missed period.
 - c. Auscultation of FHS — by stethoscope earliest by 18–20 weeks.
- v. **Height of the uterus above symphysis pubis** or measurement of SFH.
- vi. **Sonography**
 - a. First trimester — CRL (variation ± 5 days).
 - b. Second trimester (most accurate between 12 and 20 weeks) — by BPD, AC, HC, and FL (variation 7–10 days).
 - c. Third trimester — less reliable (variation ± 16 days).

Q. How do you assess the wellbeing of the fetus in this case (late pregnancy)?

Ans. A. Clinical — auscultation of FHS, assessment of fetal growth, liquor volume, and SFH measurement (in cm).

B. Biophysical parameters:

- i. **DFMCR**: kicks > 10 movements in 12 hours is satisfactory (to count 1 hour each in the morning, afternoon and night, then to multiply the total kicks by 4 to get total kicks in 12 hours).
- ii. **Nonstress test (NST)**: Reactive NST: Two or more FHR accelerations in 20 minutes observation = Healthy fetus.
- iii. **Fetal biophysical profile (FBP)** includes: NST, fetal breathing movements, gross body movements, fetal muscle tone and amniotic fluid volume. A FBP score of 8 indicates healthy fetus.
- iv. **Modified biophysical profile** consists of NST and AFI. It is abnormal when NST is nonreactive and/or AFI is < 5.
- v. **Ultrasonography**: Serial measurement of BPD, AC, HC, and amniotic fluid volume (AFV) are done to assess fetal growth.
- vi. **Doppler ultrasound**: Doppler velocimetry of the umbilical artery is studied. Reduced, absent or reversed diastolic flow indicates fetal jeopardy.

Q. What is preconceptional counseling and what are its benefits?

Ans. Preconceptional counseling means examination of the woman and counseling her about pregnancy and its outcome before the actual conception occurs.

Benefits: Preconceptional counseling can identify the risk factors beforehand. It can also reduce the complications of pregnancy as care (preventive measures) can be provided well ahead.

Anemia, infections, diabetes mellitus can be detected and treated before the actual onset of pregnancy. So the outcome of pregnancy is expected to be improved.

Q. What is your plan for management of this woman as she has been admitted?

Ans. She is a primigravida at 39 weeks of gestation without any complication. I would wait for spontaneous onset labor. Labor would be monitored closely and with partograph plotting. We expect her a successful vaginal delivery.

Q. Can she be discharged and allowed to go home as she is not in labor?

Ans. She is close to her expected date of delivery (39 weeks). I shall do a pelvic examinations to assess the condition of the cervix. If there is a prospect for her going into labor (ripe cervix) soon, it would be better for her to stay back specially when stays far away from the hospital. Otherwise, she may go home and come back with onset of labor pain for delivery in this institute.

Q. What do you mean by ripe cervix?

Ans. Ripe cervix means a transition phase of the cervix from the state of pregnancy to labor. Ripe cervix is more soft, shortened (1.5 cm in length), central in position and partly dilated (1.6 cm).

Q. What is Bishop's score?

Ans. It is a scoring system done during pelvic examination. Five parameters are assessed.

1. Cervix:

- a. Effacement
- b. Dilation (cm)
- c. Consistency
- d. Position

2. Fetal head: Station**Q. What is the usefulness of the scoring system?**

Ans. This scoring system can predict the success of induction of labor. Score marks are: 0, 1, 2, and 3. Total scoring is 13. Score: 6-13 suggests cervix is favorable and success of induction of labor is high. Score: <6 unfavorable for induction of labor.

CASE-2**PRIMIGRAVIDA WITH FLOATING (FREE) HEAD AT TERM****Case Summary**

Mrs CK, aged 25 years P0+0+0+0, has been admitted at 39 weeks of pregnancy with pain in the back. She is a booked case and had regular antenatal supervision. She is immunized and has received iron and folic acid supplementation throughout.

On general physical examination (GPE), she is of average height (5' 3"), without any pallor, BP 120/80 mmHg and otherwise fit and healthy. **Systemic examination** revealed normal cardiovascular and respiratory systems.

Obstetric examination revealed: Uterus term size and relaxed, SFH 38 cm, single fetus, longitudinal lie, cephalic presentation, 5/5th of the head is palpable per abdomen. Fetal back is on the left side. Limbs are on the right side. Liquor volume is adequate. On auscultation FHS is 147 beats per minute and it is regular.

Provisional diagnosis: Primigravida with floating head at term pregnancy

Q. What are the common causes of floating head at term?

Ans. (i) Normal, (ii) deflexion of the head, (iii) occipitoposterior position of the head, (iv) cephalopelvic disproportion, (v) placenta previa, and (vi) pelvic tumors (lower segment fibroid, ovarian tumor).

Q. When the head usually engages?

Ans. In a primigravida head usually engages after 37 weeks. This is due to increased abdominal muscle tone. However head may engage even with the onset of labor. Whereas in a multigravida, head usually engages in labor. Overall in 60% of multi and 40% of primi, head do not engage prior to labor.

Q. How can you exclude the pathologies that hinder or prevent the engagement of a normal head?

Ans. Presence of placenta in the lower uterine segment (placenta previa), usually manifests with episodes of painless vaginal bleeding which is fresh and recurrent. This patient has not got any such history. However, ultrasonography would be helpful to exclude placenta previa or any pelvic tumor.

Q. How deflexion of the head can cause nonengagement of the head?

Ans. Deflexion of the head brings bigger diameter to the brim. Either suboccipitofrontal (10 cm) or occipitofrontal (11.5 cm) diameter comes on the brim of the pelvis. Occipitoposterior position of the head also causes deflexion and delayed engagement.

Q. What is a contracted pelvis?

Ans. Alteration in the size and/or shape of the pelvis (due to shortening of pelvic diameters) to sufficient degree so as to alter the normal mechanism of labor for an average-sized baby.

Q. What is cephalopelvic disproportion?

Ans. It is the disparity in normal relation between the fetal head and the pelvis. Disproportion may be either due to an average-sized baby with a small pelvis or due to a big baby with normal-sized pelvis or due to a combination of both.

Q. What happens when the woman with occiput-posterior position goes into labor?

Ans. There are some differences in the course of labor compared to occiput-anterior position (Fig. 2.10).

- i. Engagement of the head is delayed due to deflexion of the head.
- ii. Membranes rupture early.
- iii. The first stage of labor is prolonged.
- iv. Due to long internal rotation of the head, the second stage is delayed.
- v. Operative interventions (ventouse, forceps or cesarean delivery) are increased.



Fig. 2.10: Short-statured (3'5") woman delivered by cesarean section due to cephalopelvic disproportion

Q. What happens as regard to the mechanism of labor in a case with occiput posterior position?

Ans. a. **In majority (90%) of cases**, there is favorable outcome as the occiput rotates anteriorly with correction of deflexion.
 b. **In about 10% of cases**, the outcome is unfavorable as the occiput fails to rotate anteriorly.
 The important determinants to this outcome are : (i) Shape of the pelvis, (ii) force of the uterine contraction, and (iii) correction of deflexion of the head.

Q. What would be management approach for the women?

Ans. She would be investigated to rule out any cause of floating head (as discussed above) specially placenta previa, pelvic tumor or cephalopelvic disproportion. Ultrasonography is very useful in this regard and also to have an idea about the estimated weight of the fetus (CPD). However to rule out CPD, we need to wait for spontaneous onset of labor when pelvic assessment could be done.

Q. How do you make the management decision in the case?

Ans. Once pelvic pathology is ruled out, we would wait for spontaneous onset of labor and by that time the fetal head is expected to be engaged. We would also do the pelvic assessment and rule out cephalopelvic disproportion at that time. There after partograph monitoring of labor will be done for successful vaginal delivery. However in the presence of any abnormality she would be delivered by cesarean section.

Q. How cephalopelvic disproportion is diagnosed?

Ans. Cephalopelvic disproportion at the level of the brim is mostly assessed by — (a) clinical methods, (b) imaging pelvimetry.

a. **Clinical methods**

- i. Abdominal method. It is a good screening method.
- ii. Abdominovaginal method (Muller-Munro-Kerr method).

b. **Imaging pelvimetry**

- i. **Magnetic resonance imaging (MRI)** can assess the bony pelvis, fetal size and also maternal soft tissues. It is more accurate but expensive.
- ii. **Computed tomography (CT)** is more informative compared to X-ray pelvimetry. It is done less commonly.
- iii. **X-ray pelvimetry:** Erect lateral view is generally taken. Antero-posterior view may also be taken. However, X-ray pelvimetry has got limited value and it cannot predict successful vaginal delivery. It is not recommended currently.

Q. What is clinical pelvimetry and when it is done?

Ans. In vertex presentation pelvic assessment is done at any time beyond 37 weeks but it is better to be done with the beginning of labor. The following information are recorded during the pelvic examination.

(i) Sacrum—its curvature, (ii) sacrosciatic notch, (iii) ischial spines, (iv) iliopectineal lines, (v) side walls, (vi) posterior surface of symphysis pubis, (vii) sacrococcygeal joint, (viii) subpubic arch, (ix) diagonal conjugate, (x) subpubic angle and (xi) transverse diameter of the outlet (TDO).

Q. What are the different types of pelvis?

Ans. Parent types are four : (i) Gynecoid (50%), (ii) anthropoid (25%), (iii) android (20%) and (iv) platypelloid (5%). More commonly combination of features are found (e.g. 'Gyne-android' — the first part refers the posterior segment and the second part relates the anterior segment). Thus there are total 14 types of pelvis.

Q. How do you manage a woman when there is pelvic contraction at the level of the brim?

Ans. We have to ascertain the degree of CPD by clinical examination and by imaging pelvimetry if required.

Minor degree CPD usually does not give rise to any problem. Such cases are often allowed for spontaneous labor and delivery at term. Women with moderate and severe degree of pelvic contractions are the problem. Usually they are delivered by elective cesarean section.

Q. What is trial of labor?

Ans. It is the conduction of spontaneous labor in woman with minor degree cephalopelvic disproportion, in an institution, under supervision for safe vaginal delivery. However, arrangements should be available for operative delivery either vaginal or abdominal, if the condition so arises.

Q. How do you conduct the “Trial of labor”?

- Ans.**
- The labor should preferably be spontaneous in onset.
 - The labor progress is carefully monitored (partographic monitoring).
 - Augmentation of labor may be done with amniotomy along with oxytocin infusion if needed.

Q. How does the trial of labor end?

- Ans.**
- Spontaneous vaginal delivery with or without episiotomy (30%).
 - Assisted vaginal delivery with ventouse or forceps (30%).
 - Cesarean section (40%).

Q. What are the advantages of successful trial of labor?

- Ans.**
- Unnecessary cesarean sections are avoided.
 - Successful trial may ensure future good obstetric behavior.



Fig. 2.11: Candidate demonstrates obstetric examination by pelvic grip (Leopold fourth maneuver)

CASE-3 NORMAL PUERPERIUM

Case Summary

Mrs SD, aged 23 years, P1 + 0 + 0 + 1, presents with the complaints of pain in the lower abdomen as well as in the perineum. She had been admitted last night with labor pain at the end of her term pregnancy. She was a booked case. She had spontaneous vaginal delivery with (right) mediolateral episiotomy.

On general physical examination there was no pallor. She was afebrile, normotensive and breasts were normal. Systemic examination (cardiovascular and respiratory system) did not reveal any abnormality. Height of the uterine fundus measured 13 cm above the symphysis pubis with an empty bladder. On perineal examination, lochial discharge (Lochia rubra) was normal. She had changed 3 pads. Episiotomy wound was clean and healthy.

A baby girl was born on at am (last night). The baby weighed 2.7 kg, Apgar score was 8 and 10 (cried at birth). The baby on examination was normal (at term) and healthy. Baby passed meconium and urine. The umbilicus was clean and healthy. There was no obvious congenital abnormality. The baby was on exclusive breastfeeding.

Special features to note in a case of puerperium are: (i) Start with the complaints related to puerperium only (not of antecedent pregnancy). (ii) Instead of LMP — mention the date and time of last childbirth. (iii) Instead of EDD and duration of pregnancy (weeks in antenatal cases), mention the number days in puerperium.

Q. What is your diagnosis?

Ans. Mrs SD, 23 years old lady, P1+0+0+1 is in her first day of normal puerperium.

Q. Why do you consider her as a case of normal puerperium?

Ans. She has got no significant complaints. Slight amount of pain in abdomen is common. This is known as afterpain. She also experienced slight amount of pain in the perineum which is common following vaginal delivery with an episiotomy. Her general physical examination as well as systemic examination did not reveal any abnormality. She is afebrile, her bowel and bladder activities are normal. Involution of the uterus is normal, lochial discharge is normal. Episiotomy wound is healthy and breastfeeding is normal. Baby on examination is normal.

Q. What is the normal rate of involution of the uterus?

Ans. Following delivery, uterine fundus is about 13 cm above the symphysis pubis and for the first 24 hours the height of the uterus remains unchanged.

Thereafter there is a steady decrease in height by 1.25 cm (1/2") in 24 hours. The uterus becomes a pelvic organ by 14 days' time. It takes about 6 weeks for the uterus to become normal in size.

Q. What are the causes of subinvolution of the uterus?

Ans. Factors that hinder or delay the involution of the uterus are—overenlargement of the uterus (twins, hydramnios), retained products of conception (blood clots, placental bits), puerperal sepsis following cesarean delivery, uterine fibroid, prolapse uterus and maternal illness (anemia).

Q. What are the common urinary problems in the puerperium?

Ans. 1. Urinary tract infection (UTI): Infection is often contracted during labor and puerperium due to catheterization or due to stasis of urine in puerperium or due to recurrence of previous infection.

2. Retention of urine: Due to pain and spasm following bruising of the paraurethral region and perineal region.

3. Incontinence of urine: Either stress (common) or true incontinence due to fistula formation (rare).

Q. What is this lower abdominal pain called? How are you going to manage it?

Ans. This is known as B&T. It is infrequent and spasmodic in nature. It lasts for a variable period of 2–4 days. The pain is either due to retained blood clots and/or placental bits (common in primipara) or due to vigorous spasmodic uterine contractions (common in multipara). Management is to massage the uterus to expel the retained products and to give some analgesics and antispasmodics.

Q. What are the acute complications (puerperal emergencies) that may arise in puerperium?

Ans. A. Immediate: Postpartum hemorrhage (PPH), shock (hypovolemic or idiopathic), pulmonary embolism, and inversion of the uterus.

B. Early: (within 1 week): Urinary complications, puerperal sepsis, breast complications (engorgement, mastitis, abscess), and puerperal blues.

C. Delayed: Secondary PPH, thromboembolism, and psychosis.

Q. What is milk ejection or milk let down reflex?

Ans. Suckling → nipple and areola stimulation → ascending tactile impulse via thoracic sensory nerve (T 4,5,6) → paraventricular and supraoptic nuclei of the hypothalamus → oxytocin release from posterior pituitary → contraction of myoepithelial cells of the alveoli → milk let down. This reflex is inhibited by pain and abnormal psychological condition.

Presence of the infant or even infant's cry can induce let down reflex without suckling.

Q. What is the relationship between lactation with amenorrhea and ovulation?

Ans. Breastfeeding → increased prolactin level → suppression of FSH and LH levels → less follicular growth and development → hypoestrogenic state (amenorrhea) and anovulation.

Frequency and duration of suckling correlate directly related to the level of prolactin, duration of ovarian suppression and lactational amenorrhea.

Q. When is she going to resume her menstruation normally?

Ans. It depends on whether she breast-feeds her baby or not. About 70% of the women, who are fully breastfeeding, may remain amenorrheic for the first 6 months. But a nonlactating woman, may resume her menstruation by 6 weeks time in about 40% cases.

Q. When she should start contraception in the postpartum phase?

Ans. It depends on whether she is lactating or not. Women who are exclusively breastfeeding, remain anovulatory in 90% of cases. Chance of ovulation is increased if she is not lactating or partially lactating. Recommendation is to start contraception from 3rd postpartum month if she is full breastfeeding and from 3rd postpartum week if she is feeding partially or not breastfeeding.



Fig. 2.12: Kelly's long forceps

Description: This is a long metallic instrument. It has got a smooth curve close to the blades. The handle has no catch. The blades are fenestrated with transverse serrations on their inner surface.

Uses: (1) Postplacental (following delivery of the placenta). Insertion IUCD (Cu T380 A) in the puerperal uterus, (2) As an alternative to ovum forceps for removal of retained placental bits and membranes.

This instrument has got advantages: (1) The length enables it to place the IUCD at the fundus of the puerperal uterus. (2) The transverse serration provides good grip to the IUCD. (3) Absence of catch protects the IUCD from crushing.

Q. What should be the choice of contraception for her?

Ans. It depends on whether she is breastfeeding or not. Combined oral pills should be avoided if she is breastfeeding. However, she can use DMPA 150 mg IM every 3 months (injectable progestin) or progestin only pill (mini pill) orally. Otherwise she can use IUD irrespective of her lactation status. Post-placental IUCD is currently being practised. It is safe and effective. Expulsion rate is higher compared to interval insertion. An especially designed forceps (Kelly's) is used for this purpose (Fig. 2.12).

Q. Should episiotomy be made a routine procedure?

Ans. Episiotomy has got restricted use. Current recommendation is close intrapartum supervision (to prevent perineal injury) and selective use of episiotomy.

Q. What are the appropriate indications of episiotomy?

Ans.

- Cases with rigid perineum as in elderly primigravidae; previous perineal scar-like perineorrhaphy.
- Instrumental delivery — forceps and ventouse.
- Malposition (occipitoposterior), malpresentation (breech delivery) or shoulder dystocia.
- Threatened perineal tear.

Q. When should the baby be put to breast following delivery? What should be the frequency and duration of each feed?

Ans. Following normal delivery, a healthy baby may be put to breast immediately or by 1/2–1 hour. Following cesarean delivery a period of 3–4 hours is sufficient. Initially the frequency should be at 2–3 hours interval. Baby is fed from one breast completely over a period of 5–10 minutes. Baby should get both the foremilk and hindmilk in this way.

Q. What do you understand by good attachment?

Ans. Good attachment during breastfeeding means infant's mouth is wide open and chin touches the breast. The nipple and areola should be within the baby's mouth between the tongue and the palate. This helps effective milk transfer.

Q. When is she going to be discharged from the hospital?

Ans. This woman with normal puerperium could be discharged after 24–48 hours.

Q. What advices do you give her during the discharge?

Ans. To maintain her general health with good diet and to continue the iron and calcium supplementation.

- To continue breastfeeding exclusively and care of the baby (immunization).
- To take care of her breasts (cleaning the nipples with sterile water before and after each feed). Care of the episiotomy wound (cleaning with Savlon swab twice daily and after each act of micturition and defecation). Application of an antibiotic ointment should be done thereafter.
- Family planning guidance (contraceptive advice).
- To come for postnatal check-up after 6 weeks or to report early if she has any problem.
- Postpartum exercises.

Q. What are the common causes of subinvolution of the uterus?

Ans. (i) When the uterus is hugely enlarged as in twins, (ii) grand multiparity, (iii) cesarean section, (iv) retained products of conceptus, (v) uterine sepsis, (vi) uterine prolapse, and (vii) fibroid uterus.

Q. How can breast engorgement be prevented?

Ans. (i) No prelacteal feeds, (ii) to start breastfeeding early and unrestricted, (iii) exclusive breastfeeding, and (iv) feeding in correct position with proper attachment.

Q. How do you manage the woman with acute mastitis in puerperium?

Ans. (i) Breast support, (ii) plenty of oral fluids, (iii) antibiotic—flucloxacillin, (iv) analgesic (ibuprofen), and (v) breastfeeding to be continued.

Q. She faced difficulty in breastfeeding her baby. How are you going to help her?

Ans. Correct position of the mother, frequent feeding and correct attachment of the baby with the breast can improve the outcome. For any other difficulties, a trained nurse may be helpful.

CASE-4**PUERPERIUM NORMAL AND ABNORMAL**

Ms CD, 25 years old, P1+ 0 + 0 + 1, had her spontaneous vaginal delivery 4 days back at home. She was feeling some uneasiness since delivery, and she has developed fever (temperature of 102° F) since yesterday. She had also the problems of burning sensation during passing urine. However, her baby is doing well. She is having normal breastfeeding to her baby.

Q. How do you define puerperium?

Ans. Puerperium is the period immediately following childbirth and extending up to 6 weeks postpartum.

Q. What is the usual time period for the involution of the uterus?

Ans. By two weeks of puerperium, uterus usually becomes a pelvic organ. However, it takes 6 weeks postpartum for all pelvic organs including uterus to go back to its normal pregravid state.

Q. What is the cause of amenorrhea in puerperium?

Ans. Women who are breastfeeding remain amenorrheic for a longer period compared to women who are bottle-feeding.

In lactating women, the serum levels of prolactin remain high. High prolactin suppresses both FSH and LH. This causes less follicular growth. There is a hypoestrogenic state and the woman becomes amenorrheic. However, women who are not breastfeeding, menstruation returns by 12th week in majority (80%).

Q. What is the cause of anovulation in puerperium?

Ans. Suppression of ovulation is related to persistently elevated prolactin levels in a lactating woman. A woman who is exclusively breastfeeding, the contraceptive protection due to anovulation remains upto 6 months postpartum in majority (98%). In a nonlactating woman ovulation may return as early as 4 weeks.

Q. How do you define puerperal pyrexia?

Ans. A rise in temperature of 100.4°F (38°C) or more on two separate occasions at 24 hours apart (excluding first 24 hours) within first 10 days of following delivery is called puerperal pyrexia.

Q. What are the common causes of puerperal pyrexia?

Ans.

1. Puerperal sepsis (infections of the genital tract)
2. Urinary tract infection (cystitis)
3. Breast infection (mastitis)
4. Wound infection
5. Pulmonary infection (pneumonia and tuberculosis)
6. Thrombophlebitis.

Q. What are the common causes of puerperal sepsis?

Ans.

- a. Endometritis
- b. Endomyometritis
- c. Pelvic cellulitis

Q. What are the common predisposing factors for puerperal sepsis?

Ans. 1. **Antenatal factors**

- a. Anemia and malnutrition
- b. Premature rupture of membranes.

2. **Intrapartum factors**

- a. Repeated vaginal examination
- b. Prolonged rupture of membranes >18 hours
- c. Traumatic instrumental delivery (forceps)
- d. Prolonged labor
- e. Dehydration, ketoacidosis in labor

Q. What are the common organisms involved in puerperal sepsis?

Ans. Organisms are often polymicrobial (**aerobic**: gram-positive and gram-negative, and **anerobic**) in nature.

Aerobic:

- Group A *Streptococcus hemolyticus* (GAS)
- *Staphylococcus pyogenes*
- *E. coli*
- *Pseudomonas*

Anerobic:

- *Streptococcus*
- Bacteroides (fragilis), Clostridia

Q. What investigation do you do in such a case?

Ans. It will depend upon the clinical examination findings.

Common investigations are:

- a. High vaginal swab/wound swab for culture and sensitivity.
- b. Midstream urine for culture and sensitivity.
- c. Complete blood count (CBC).
- d. Pelvic ultrasound: To detect any retained bits of tissue inside the uterus or to detect pelvic abscess.
- e. X-ray chest: To detect pathology (pneumonia and Koch's lesion).
- f. Doppler USG study: To detect venous thrombosis.

Q. What are the conditions when lactation needs to be suppressed?

Ans. Conditions are: Cases with—(a) Stillbirth, (b) neonatal death and (c) situations where breastfeeding is contraindicated: (i) maternal acute puerperal illness, (ii) puerperal psychosis, and (iii) mother on high doses of antiepileptic, antithyroid drugs.

Q. How is lactation suppressed?

Methods commonly used are: (a) to stop breastfeeding, (b) ice packs to prevent breast engorgement (c) analgesics to relieve pain, and (d) to use breast support.

Medications to use are Bromocriptine or cabergoline.

CASE-5**PREGNANCY AND LABOR IN A WOMAN WITH PRIOR CESAREAN DELIVERY****Case Summary**

Mrs AR, 24 years old, P1+0+0+1, was admitted at 38 weeks of pregnancy. She had been delivered in her previous pregnancy by LSCS due to fetal distress. She had got no major complaints. On examination, she was not pale. She was otherwise fit and healthy. Her height was 5' 3", BP was 120/80 mmHg. Obstetric examination revealed—Uterus : Term size (SFH 36 cm), single fetus, cephalic presentation, head not engaged. Back on the right side and limbs on the left. Clinically liquor volume average, FHS 142 beats/minute and regular. There was no scar tenderness. P/D — Mrs AR 24 years, P1+0+0+1 at 38 weeks of pregnancy with history of prior cesarean delivery.

Q. Why had she been admitted?

Ans. To formulate the plan of delivery. Because of her history of previous cesarean delivery, she is a high-risk woman.

Q. What are the risks that such a woman may have, considering her previous cesarean delivery?

Ans. For such a woman, certain risks are increased in subsequent pregnancy and labor.

Pregnancy: (i) abortion, (ii) preterm labor, (iii) normal pregnancy ailments (pain abdomen), (iv) placenta previa (APH), (v) morbid adherent placenta, (vi) scar dehiscence, (vii) scar rupture.

Labor: (i) scar dehiscence, (ii) scar rupture, (iii) retained placenta (placenta accreta), (iv) postpartum hemorrhage, (v) peripartum hysterectomy, and (vi) increased operative intervention.

All these lead to increased **maternal and perinatal** morbidity and mortality.

Q. What are the different types of uterine scar for cesarean delivery? What type of scar does usually rupture during pregnancy and labor? What type of scar rupture is frequent?

Ans. Lower segment transverse incision is most commonly made in cesarean delivery. Upper segment vertical scar is rare and is either due to classical cesarean delivery or due to hysterotomy.

As regards the rupture of scar, we should consider the following anatomical factors: (i) wound apposition, (ii) healing of the wound following delivery, and (iii) the stretching of the wound during subsequent pregnancy and labor.

Lower segment transverse scar usually ruptures during labor, whereas classical scar usually ruptures during late pregnancy or in labor.

Incidence of lower segment scar rupture is less (about 0.2–1.5%) as compared to classical scar rupture which is common (about 4–9%).

Q. Why is a lower segment transverse scar more sound than a classical scar?

Ans. (i) Wound margins are perfectly apposed without any pocket formation, (ii) healing is better as this part remains inert during that time (puerperium), and (iii) in future pregnancy and labor, the wound stretches along the line of the scar. But in classical scar, it is at right angle.

Q. How do you assess the scar tenderness?

Ans. Commonly lower uterine segment transverse incision is made during cesarean delivery. Therefore assessment of scar tenderness is done along the transverse length of the scar of the lower segment of the uterus (not the scar of the skin). Pulp of the fingers (using both the hands) is gently rolled up and down over the area above the symphysis pubis to feel any gap in the continuity of vv wall. At the same time we need to look at the face of the woman, to observe any expression of pain. However there is no single pathognomonic clinical feature to indicate scar dehiscence or rupture (Figs 2.13 and 2.14).



Fig. 2.13: Assessment of scar tenderness for a lower segment transverse scar. Pulp of the fingers (using both the hands) is gently rolled up and down over the area above the symphysis pubis, while the examiner looks at the face of the patient

Q. What are the features of impending scar rupture during labor?

Ans. (i) Suprapubic pain, (ii) vaginal bleeding, (iii) bladder tenesmus, (iv) maternal tachycardia, (v) falling of blood pressure, (vi) tenderness over the scar, (vii) failure in progress of labor, (viii) **appearance of fetal distress** and (ix) **abnormal CTG (variable or late deceleration pattern and bradycardia)**.

Q. What is uterine scar dehiscence?

Ans. It is the incomplete disruption of the uterine wall. Usually the uterine serosa, overlying the area of uterine muscular defect remains intact. A dehiscence is described as an uterine window. Uterine dehiscence is usually detected incidentally during the time of cesarean section. Usually there is either no hemorrhage or minimal hemorrhage. The woman usually remains asymptomatic. However these two terms (uterine rupture and uterine dehiscence) are used frequently interchangeably. But the clinical significance of these two conditions is different.



Fig. 2.14: Candidate demonstrates assessment of scar tenderness in a woman with history of prior cesarean delivery. Note the candidate's fingers' position and at the same time she looks towards the patient's face for expression of pain (also Fig. 2.13).

Q. What is uterine rupture?

Ans. It is the complete separation of all layers of the uterine wall, including the serosa. In this situation, uterine cavity and the abdominal cavity are continuous. This is an obstetric emergency putting the fetus and the mother in danger.

Q. What is the risk of uterine rupture?

Ans. Risk of rupture in a scarred uterus is high compared to an unscarred uterus. Uterine rupture can occur following other operations on the uterus like myomectomy or hysterotomy. The overall risk of uterine rupture with a prior to low transverse scar is about 1%, with a low vertical scar is 1–7% and with a classical or hysterotomy scar is 4–9%.

Q. What are complications of uterine rupture?

Ans. A. **Fetal:** Hypoxia and death.
B. **Maternal:** Intraperitoneal hemorrhage, shock, urgent need of blood transfusion, laparotomy, hysterectomy or repair of rupture. Risk of maternal and perinatal mortality is high unless managed optimally.

Q. What is VBAC?

Ans. Vaginal Birth After Cesarean.

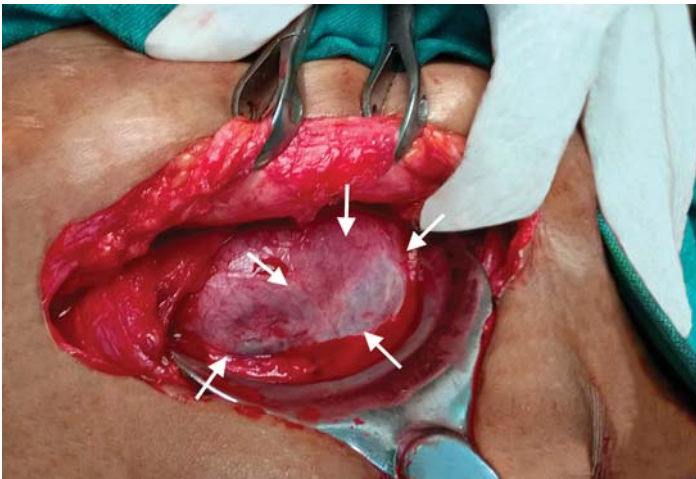


Fig. 2.15: Scar dehiscence

Mrs. CR, 2nd gravida, with prior cesarean delivery was admitted at 38 weeks of pregnancy with pain abdomen. Clinical examination revealed vitals were stable with doubtful scar tenderness. Laparotomy for emergency cesarean delivery revealed scar dehiscence. (See arrows)

Q. Who are the women who are not considered for VBAC?

Ans. Women with—(i) previous classical cesarean delivery or hysterotomy should be delivered by elective cesarean section after 37 completed weeks, (ii) previous two or more lower segment cesarean section, (iii) contracted pelvis or suspected CPD, (iv) presence of other complications in pregnancy like PIH and malpresentation, (v) in a center where facilities for emergency cesarean delivery are not available round the clock and (vi) patient refusal.

Q. Who are the women who are considered for VBAC?

Ans. (i) A woman for whom indication of primary section was nonrecurrent, (ii) previous lower segment single transverse scar, (iii) pelvis adequate for the fetus, (iv) continued labor monitoring is possible, (v) facilities for emergency cesarean section round the clock are available (vi) facilities for blood transfusion and (vii) patient consent.

Q. What are the benefits of VBAC?

- Ans.**
- ❑ If VBAC is successful, laparotomy for cesarean section can be avoided.
 - ❑ Recovery following vaginal delivery is quicker compared to that of a cesarean delivery.
 - ❑ The duration of hospital stay is much less in cases following successful vaginal delivery.
 - ❑ The associated morbidity due to infections, blood transfusion is also less in VBAC compared to cesarean delivery.
 - ❑ Above all, the woman's satisfaction is very high.

Q. What are the risks of VBAC?

Ans. The most important risk of VBAC is the uterine rupture and its complications mentioned earlier. However, this complication is uncommon (< 1%) in a well-selected case when labor is monitored carefully in a medical college or a tertiary level center.

Q. What is the success rate with VBAC?

Ans. Overall success rate is about 70%. Success rate is more in women who have delivered vaginally at least once either before or after the index cesarean.

Q. What is your opinion about “once a cesarean means always a cesarean delivery”?

Ans. See SAQ, p 219.

Q. How do you diagnose impending scar rupture?

Ans. **Appearance of fetal distress is the most consistent sign.** A variable deceleration pattern in CTG changing into late decelerations and bradycardia occurs in about 60% of cases with uterine rupture. In late cases, fetal heart sound may be absent (IUFD).

Q. When should a woman with previous cesarean section be admitted in pregnancy and why?

Ans. All such cases are considered as “high-risk”. Generally women with lower segment scar should be admitted at 38th week and women with classical scar should be admitted at 36th week. This is the plan of elective admission. However, she may be admitted earlier (as an emergency) at any time if she has got any other problem (e.g. pain abdomen and vaginal bleeding).

Q. How are you going to manage this woman?

Ans. She should be admitted in a tertiary care hospital. Indication of her previous cesarean section was a nonrecurrent one. She has to be examined internally to assess the Bishop’s score and also the pelvis. Considering her history and examination, she may be allowed for spontaneous onset of labor and vaginal delivery. However, in that case, she would be monitored carefully during the entire course of labor (FHR, progress of labor and for scar tenderness). Monitoring of labor progress using a partograph and electronic fetal monitoring is needed. Second stage of labor may be cut short with ventouse or forceps. However, if she does not go into spontaneous labor and she crosses her EDC, she should be delivered by planned (elective) cesarean section.

Q. Would you explore the uterine scar after delivery of the placenta?

Ans. Routine exploration of uterine scar is not done. On clinical examination, if placenta is found complete and the uterus is well-retracted without any significant vaginal bleeding, we generally do not explore the uterine scar as a routine. Otherwise it may be done using two fingers inside to palpate the scar for detection of scar rupture. However, scar separation is difficult to diagnose on digital palpation. Most asymptomatic scar dehiscence heals well.

CASE-6 ANEMIA IN PREGNANCY**Case Summary**

Mrs BC, a 21-year-young primigravida presents with the problem of tiredness, giddiness, and occasional dyspnea while doing her daily household work. She is an unbooked case, admitted at 30 weeks of gestation. On examination, she is severely pale, BP 120/80 mmHg and with bilateral pedal edema. Her cardiovascular and respiratory systems are normal. Her obstetric examination revealed symphysio-fundal height 30 cm, single fetus, cephalic presentation, FHS 145 beats per minute regular, with adequate amount of liquor.

Q. What is your provisional diagnosis?

Ans. Severe anemia in pregnancy.

Q. What would be the possible causes of anemia?

Ans. Deficiency anemia of which iron deficiency anemia (microcytic hypochromic) is common [see Fig. 2.16]. Other deficiency anemias are—folic acid and vitamin B₁₂ (megaloblastic). Dimorphic anemia is due to deficiency of both iron and folic acid or vitamin B₁₂ (macrocytic or normocytic and hypochromic or normochromic).

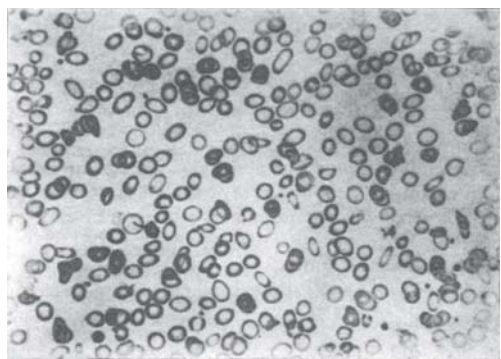


Fig. 2.16: Peripheral blood film showing hypochromic microcytic anemia

Other causes of anemia

are: Hemorrhage (APH), hereditary (thalassemias), bone marrow insufficiency, infection (malaria) or chronic disease (renal).

Q. What are the different grades of anemia?

Ans. Arbitrary gradings with hemoglobin levels done are: Mild—Hb level: 8–10 gm%; Moderate—7–8 gm%; and Severe < 7 gm% (very severe: < 4 gm%).

Q. What investigations are needed to know the cause of anemia?

Ans. Complete hemogram including peripheral blood film.

- If microcytic and hypochromic (MCV < 80), serum iron values (serum iron, serum ferritin, serum iron binding capacity) are estimated.
- When serum values of iron and ferritin are low with high serum iron binding capacity—iron deficiency anemia is considered.
- If microcytic but normochromic and serum iron values are normal or high, hemoglobin electrophoresis for detection of hemoglobinopathies is to be done.

- If macrocytic (MCV > 94)—serum folic acid and vitamin B₁₂ estimation is done.
- If normocytic (MCV : 80–94)—we should think of drugs, infection or bone marrow pathology.

Q. What are the complications of untreated anemia in pregnancy?

Ans. MATERNAL

♦ **Pregnancy**

- Infection • Cardiac failure • Pre-eclampsia • Preterm labor

♦ **Labor:** • Cardiac failure • Uterine inertia • PPH • Shock

♦ **Puerperium**

- Puerperal sepsis • Subinvolution • Venous thrombosis
- Failing lactation.

FETAL

- IUGR • IUFD • Preterm baby and its hazards
- Higher perinatal mortality (9 times).

Q. At what time (pregnancy, labor or puerperium) the risk of cardiac failure is greatest?

Ans. (i) Around 30–32 weeks, (ii) during labor, (iii) immediately after the delivery and (iv) any time in puerperium. Risks are mainly due to cardiac failure or infection.

Q. What treatment you will advise her for the anemia?

Ans. Treatment would be guided according to the cause, period of gestation, type (discussed above) and severity of the anemia. However, as iron deficiency anemia is common, once she is diagnosed as a case of iron deficiency anemia, she is advised balanced diet rich in protein, iron, folic acid and vitamins.

Q. How do you prescribe oral iron?

Ans. Fersolate tablet containing 200 mg ferrous sulfate (60 mg of elemental iron) is prescribed 1 tablet 3 times a day. The dose is to be increased depending upon the tolerance (6 tablets a day) till the blood picture is normal. Maintenance dose (1 tablet a day) is continued at least for 100 days following delivery. Drinking of tea should be avoided within an hour of taking iron tablets.

Q. How do you assess the response of oral iron therapy?

Ans.

- Improved sense of well-being.
- Increased appetite.
- Rise in hemoglobin level.
- Reticulocytosis.
- Normal hematocrit.

Q. What are the indications of parenteral iron therapy?

- Ans.**
- Patient is intolerant to oral iron (vomiting, diarrhea, and constipation).
 - Absorption is unpredictable by oral route (malabsorption).
 - Patient seen in her last 8–10 weeks of pregnancy.

Q. What are the advantages of parenteral iron therapy?

- Ans.** Total dose of iron needed to correct the hemoglobin deficit and the amount to build up the iron store is calculated and administered either by IM or IV. Parenteral therapy ensures the certainty of its administration. It avoids the side effects due to gastrointestinal intolerance. However, the rate of rise in hemoglobin is the same with both the methods.

Q. What are the common preparations available for parenteral iron therapy?

- Ans.** (i) Iron (ferrous) sucrose; and (ii) iron dextran complex.
Ferrous sucrose is safe, effective and has got less side effects (ACOG 2008).
Iron sucrose is given IV 100 mg (at a time) in 100 ml normal saline slowly over 15 minutes.

Q. What is TDI?

- Ans.** Total dose infusion (TDI) is the administration of total amount of iron required to correct the deficit. It is given by IV infusion.

Q. What are the advantages of TDI?

- Ans.** (i) The woman is given the treatment and discharged on the same day.
(ii) No need of repeated IM injections that are painful.
(iii) It is less costly.

Q. How do you calculate the total amount of iron for TDI?

- Ans. Iron sucrose:** Total iron dose (mg) = $2.4 \times W \times D + 500$ [W = weight (kg)];
D = Hb (Target – Actual) gm/dl; 500 mg for body store (for dose schedule, manufacturer's information is to follow).

Q. What are the indications of blood transfusion?

- Ans.**
- Anemia due to blood loss (placenta previa and bleeding piles).
 - Severe anemia (Hb < 7 gm/dl).
 - Advanced pregnancy (≥ 36 weeks).
 - Refractory anemia.
 - Associated infection.
 - Cases of PPH.

Q. What are the advantages of blood transfusion?

- Ans.**
- Immediate improvement.
 - Increased O₂ carrying capacity of blood.
 - Stimulates erythropoiesis.
 - Supply of blood proteins and antibodies.

Q. What special precaution should be taken when she goes into labor?

- Ans.**
- O₂ inhalation.
 - Strict asepsis.
 - Injection oxytocin IM, 10 IU, is given soon following delivery of the baby to prevent PPH.
 - May need packed cell transfusion to avoid cardiac overload.

Q. What is the overall prevalence of anemia in our country?

- Ans.** More than 50% of pregnant women in India are anemic, nearly 50% of all adolescent girls (adolescent girls constitute 20% of the total population) suffer from nutritional anemia and nearly 60% of all preschool children (< 6 years), suffer from varying degree of anemia.

Q. What is the major concern with anemia?

- Ans.** One in five (20%) of all maternal deaths is attributed to anemia in pregnancy. This is the major concern.

Q. What is the current recommendation (Government of India, WHO) to prevent this complication?

- Ans.** As a priority:
- **All pregnant and lactating women** must take one iron folic acid (IFA) large tablet per day for a minimum of 100 days (see also SAQ p. 223). She should take this after the first trimester irrespective of her hemoglobin level.
 - **All adolescent girls** should take one IFA (large) tablet daily for 100 days since the onset of menstruation.
 - **All preschool children** (1–5 years) — should take one IFA (small) tablet daily for 100 days.

CASE-7**DIABETES IN PREGNANCY****Case Summary**

Mr AR, 28 years old, primigravida was admitted at 34 weeks of gestation with complaints of recurrent attacks of vulvovaginitis and urinary tract infection. Her antenatal check-up was otherwise uneventful. Her obstetric examination revealed, single fetus, longitudinal lie, cephalic presentation. FHS was heard 141/minute regular, on the left spinoumbilical line. Her investigations revealed fasting plasma glucose level was 110 mg/dl and 2-hour postglucose value was 150 mg/dl. Her plasma glucose values were within normal limits when done before pregnancy.

Q. What is your provisional diagnosis?

Ans. Gestational diabetes mellitus (GDM).

Q. How do you define gestational diabetes mellitus (GDM)?

Ans. GDM is defined as carbohydrate intolerance of variable severity with onset or first recognition during the present pregnancy.

Q. Who are the high-risk women to develop GDM?

Ans. Women with—(a) positive family history of diabetes, (b) previous baby weight ≥ 4 kg, (c) previous stillbirth, (d) presence of polyhydramnios, (f) obesity (BMI > 30), (g) age ≥ 30 years, (h) recurrent vaginal candidiasis and (i) persistent glycosuria—are all considered high-risk women.

Q. When is a woman in pregnancy called diabetic?

Ans. A woman is having fasting plasma glucose >126 mg/dl and 2-hour postglucose (75 gm), value exceeds 200 mg/dl is diagnosed in overt diabetes (ACOG)? Woman with clinical features of diabetes like—polyphasia, polyuria, random. Blood glucose > 200 mg/dl or Hb A1C > 6.5 are considered diabetic.

Q. What is prevalence of GDM in India?

Ans. Overall 3.8–21%.

Q. How do you screen and diagnose GDM?

Ans. According to American Diabetic Association (ADA), screening is done for high-risk women. However many others recommend universal screening.

Procedure:

A 50 gm oral glucose challenge test without regard to time of the day or last meal, between 24 and 28 weeks of pregnancy, is done.

A plasma glucose value > 140 mg/dl or that of whole blood 130 mg/dl at 1 hour is considered the cut-off point for doing 100 gm (WHO 75 gm) oral glucose tolerance test (OGTT). OGTT is done at 0, 1, 2 and 3 hours. GDM is diagnosed (Carpenter and Coustan) if any two values meet or exceed the cut off value: Fasting > 95 mg/dl; postglucose values: 1 hour >180 mg/dl; 2 hours > 155 mg/dl and 3 hours >140 mg/dl.

WHO defines GDM with the cut-off value of fasting plasma glucose between 92 mg/dl and 125 mg/dl and 2 hours 75 gm postoral glucose value between 153 mg/dl and 199 mg/dl.

Q. What is the recommendation of Diabetes in Pregnancy Societies of India (DPSI) for screening and diagnosis of GDM?

Ans. DPSI recommends a single test procedure to diagnose GDM in the community.

Procedure: In the antenatal clinic, a pregnant woman is given a 75 gm oral glucose load without regard to the time of the last meal. A venous blood sample is collected at 2 hours. GDM is diagnosed if 2-hour plasma glucose value is >140 mg/dl.

Q. What are the effects of diabetes on pregnancy?

Ans. 1. Effects of diabetes on the mother

- A. *During pregnancy:* (a) Preterm labor, (b) infections (urinary tract, vulvovaginitis), (c) increased pre-eclampsia, (d) polyhydramnios (25–50%), (e) diabetic retinopathy, nephropathy.
- B. *During labor:* a) Shoulder dystocia, (b) increased operative delivery (cesarean section).

2. Effects on the fetus and neonate

- A. *Fetal:* (a) Miscarriage, (b) fetal macrosomia, (c) congenital malformations, (d) intrauterine fetal death (IUFD).
- B. *Neonatal:* (a) Hypoglycemia, (b) respiratory distress syndrome, (c) hyperbilirubinemia, (d) hypocalcemia, (e) cardiomyopathy.

3. During puerperium: (a) Puerperal sepsis, (b) fall in the requirement of insulin.

Q. What should be the ideal plasma glucose level in woman with diabetes in pregnancy?

Ans. (a) Fasting ≤ 95 mg/dl, (b) 2-hour PP ≤ 120 mg/dl, (c) morning (2 am–6 am) ≥ 60 mg/dl, (d) mean plasma glucose should be between 105 and 110 mg/dl. Desirable level of HBAIC should be $\leq 6\%$.

Q. How should the woman be advised as regards diet pattern?

Ans. a. Diet = 30 kCal/kg for a normal weight woman.
 b. Carbohydrate = 50%
 c. Protein = 20%
 d. Fat = 25–30%

Usually three-meal regimen (breakfast 25%, lunch 30% and dinner 30%) of total calorie intake with several snacks in between are advised.

Women are advised to control diet first and if values are exceeded even on diet, insulin therapy is suggested.

Q. What are the different malformations in infants with diabetic mothers?

Ans. A. CNS : Neural tube defects and microcephaly
 B. Skeletal system : Sacral agenesis
 C. Cardiovascular : ASV and VSD
 D. Renal : Agensis and horse-shoe kidney
 E. GI system : Duodenal atresia.

Q. What are the important issues in the management of a woman with diabetes in pregnancy?

Ans. a. Preconceptional counseling to maintain optimum glycemic status actually before conception.
 b. Preconceptional folic acid supplementation therapy is to be given.

- c. Prenatal diagnosis to detect fetal congenital malformations including echocardiography.
- d. Dietetic advice to maintain desired glycemic status, if not obtained, to use insulin.
- e. Prevention and early detection of complications.
- f. Close antenatal fetal monitoring (DFMC; NST, BPP, and Doppler study as indicated).

Q. What are the indications of cesarean delivery for a woman with diabetes in pregnancy?

- Ans.**
- a. Fetal macrosomia
 - b. Elderly primigravida
 - c. Diabetes with complications
 - d. Diabetes difficult to control
 - e. Presence of obstetric complications (pre-eclampsia)
 - f. Multigravida with bad obstetric history

Q. What are the complications of a woman with GDM?

Ans. 1. Fetal

- a. Macrosomia
- b. Birth trauma
- c. IUFD
- d. Increased perinatal morbidity and mortality.

2. Maternal

- a. Polyhydramnios
- b. Recurrence of GDM in subsequent pregnancy
- c. Development of overt diabetes (50%) by 15–20 years.

Q. What is the contraceptive advice for such a woman?

Ans. Once blood glucose levels are controlled, many contraceptive options are there:

- Combined oral contraceptive pills (low dose) may be used.
- Barrier method may be used for spacing of birth (failure rate is high).
- Progestin only pill may be used as an alternative.
- IUCD may be used.
- Sterilization is considered when family is completed.

Q. What is the significance of measuring HBA₁C levels?

- Ans.**
- a. Levels of HBA₁C are raised in cases where hyperglycemia is present for a long period.
 - b. It reflects the status of glycemic control over the last 3 months.
 - c. Normal level of HBA₁C is < 6%.
 - d. Levels > 6, when measured in early pregnancy, increase the risk of fetal congenital malformations.
 - e. It is not used for diagnosis of GDM, as it reflects the retrospective status.
 - f. Raised value of HBA₁C (> 6) during pregnancy suggests poor glycemic control and the risks of diabetic complications are high.

CASE-8**BREECH PRESENTATION****Case Summary**

Mrs LS, 28 years old, P0+0+1+0 was admitted from the antenatal clinic at 38 weeks of gestation. She did not have any significant complaints. She was advised admission by her physician for the plan of delivery due to the abnormal presentation of the baby. Her general physical examination did not reveal any abnormality. Examination of the CVS and respiratory systems were normal. Obstetric examination revealed, single fetus longitudinal lie, podalic pole on the brim, head at the fundus, back on the right side and limbs are on the left side. FHS was heard above the level of the umbilicus on the right side.

Q. What is your provisional diagnosis?

Ans. Mrs LS, 28 years old, P0+0+1+0, admitted at 38 weeks of gestation with clinically diagnosed breech presentation.

Q. How can you confirm the diagnosis?

Ans. Ultrasound scan.

Q. What are the different varieties of breech presentation?

Ans. a. Complete breech (flexed attitude).
b. Incomplete breech: (1) Breech with extended legs (Frank breech) (Fig. 2.17). (2) Footling presentation. (3) Knee presentation.

Clinical varieties are:

a. Uncomplicated breech.
b. Complicated breech (associated with placenta previa, pre-eclampsia, etc.).



Fig. 2.17: Baby delivered as breech with extended legs (Frank breech). Extended position of the legs still maintained

Q. What other information can be obtained with sonography besides breech presentation?

Ans. Besides confirmation of the diagnosis of breech presentation, other information that can be obtained with USG are: (i) Fetal congenital abnormality, (ii) fetal weight, (iii) types of breech, (iv) attitude of the head (see below), (v) placental localization, (vi) uterine anomalies.

Q. What are the important causes of breech presentation?

Ans. (i) Prematurity—most common, (ii) breech with extended legs, (iii) twins, (iv) short cord, (v) oligohydramnios, (vi) polyhydramnios, (vii) uterine malformations (septate, bicornuate uterus), (viii) hydrocephalus, (ix) placenta previa.

Q. What are the important areas of breech delivery where the cardinal movements take place?

Ans. (i) **Buttocks**—Engaging diameter—Bitrochanteric (4" or 10 cm)
(ii) **Shoulders**—Bisacromial diameters (4 3/4" or 12 cm)
(iii) **Aftercoming head**—Suboccipitofrontal diameter (10 cm).

Q. How do you formulate the management of a case with breech presentation during the antenatal period?

Ans. (i) To identify any complicating factors (e.g. pre-eclampsia, APH) and to continue the antenatal care.
(ii) To perform external cephalic version—if not contraindicated.
(iii) To formulate the management when version fails or is contraindicated (e.g. either to allow assisted vaginal breech delivery or to deliver by elective LSCS).

Q. What other information are necessary for planning the management of the above woman?

Ans. Type of breech presentation (flexed or Frank breech or footling presentation), attitude of the head (flexed or extended), placental localization, estimated fetal weight, any congenital anomaly of the fetus or of the uterus.

Q. What is the advantage of external cephalic version (ECV) and what is the chance of success?

Ans. Successful version and delivery as vertex reduces the need for cesarean section significantly. It also reduces the complications of vaginal breech delivery. Success rate of ECV is 70–80%.

Q. What factors must be considered before proceeding to ECV?

Ans. Case must be evaluated as regards the possibility of success of ECV (adequate liquor volume) and to exclude the contraindications, e.g.

- (i) Diagnosed or suspected placenta previa
- (ii) History of previous cesarean delivery
- (iii) Severe pre-eclampsia
- (iv) Presence of fetal or uterine malformation
- (v) Multiple pregnancy
- (vi) IUFD
- (vii) Abnormal CTG.

Q. At what time is ECV appropriate and what are the dangers of ECV?

Ans. At 36 weeks or thereafter.

Dangers are:

- Rupture of the membranes and/or preterm labor
- Placental abruption
- Umbilical cord entanglement around the fetal parts
- Fetal distress.

Q. Evaluate critically the place of ECV in the management of breech presentation.

Ans. see SAQ p 214.

Q. What are the common indications of elective cesarean section in breech?

- Ans.**
- (a) Big baby (estimated weight > 3.5 kg)
 - (b) Hyperextension of the head
 - (c) Footling presentation
 - (d) Breech with complications (APH and pre-eclampsia).

Q. What important factors must be considered before allowing her for vaginal breech delivery?

- Ans.**
- Size of the baby: Average size (≤ 3 kg)
 - Pelvic adequacy: Adequate pelvis
 - Center having facilities for emergency cesarean section
 - No hyperextension of the fetal head
 - Without any other complications (e.g. severe pre-eclampsia)
 - Frank breech is preferred for vaginal delivery.

Q. What precautionary measures are taken and what principles are followed during the process of assisted vaginal breech delivery?

Ans. Precautionary measures are taken beforehand for the availability of: (i) An anesthetist, (ii) pediatrician, (iii) assistant, (iv) episiotomy set, (v) a pair of obstetric forceps, and (vi) neonatal resuscitation set.

Principles to follow are: (i) Not to be hasty, (ii) never to pull from below but to push from above, (iii) always to keep the fetus with the back anterior.

Q. What are the dangers of a vaginal breech delivery?

Ans. Fetal:

- Difficulty in delivery of the after-coming head (Fig. 2.18).
- Intracranial hemorrhage.
- Asphyxia.
- Injury: Fracture femur and clavicle.
- Injury to liver and lungs.
- Nerve injury — medullary coning, spinal cord, and brachial plexus.
- Increased perinatal mortality (5–30%).

Maternal: Trauma to the genital tract, sepsis and complications due to anesthesia. Maternal morbidity is raised.



Fig. 2.18: Vaginal breech delivery with the aftercoming head at the pelvic outlet

Q. What are the different methods for the delivery of the aftercoming head?

- Ans.** (a) **Burns-Marshall method:** Lifting the baby's trunk in an upward and forward direction, holding at the ankles. This is done when the nape of the neck is visible under the pubic arch.
- (b) **Forceps delivery** — when the head is in the pelvic cavity. Piper's forceps is specially designed for this. The head is delivered slowly.
- (c) **Malar flexion and shoulder traction** (modified Mauriceau Smellie-Veit technique).

Assistant is to give suprapubic pressure during this period to maintain flexion of the head.

Q. When there is difficulty in delivery of the shoulders, what maneuver is commonly done?

- Ans.** Lovset's maneuver is commonly done. Here the fetal trunk is rotated 180°, maintaining a steady downward traction.

With this rotation, the posterior shoulder which was initially below the sacral promontory appears below the symphysis pubis. The process is then repeated in a reverse direction to release the anterior shoulder.

Q. What is the overall incidence of cesarean section for breech presentation?

- Ans.** Overall incidence is 15–50%, of which 80% is elective.

CASE-9**PROLONGED PREGNANCY (POSTDATED PREGNANCY)****Case Summary**

Mrs VZ, 26 years old, P0+0+0+0, has been admitted in the hospital at 41 weeks and 5 days of gestation. She has no significant complaints. On clinical examination, she is found normotensive. Obstetric examination revealed— single fetus, cephalic presentation, 3/5th palpable per abdomen, adequate liquor. FHR was 148 beats per minute and was regular.

Q. What is this clinical situation called?

Ans. Prolonged pregnancy or postdated pregnancy.

Q. What do you understand by post-term pregnancy?

Ans. Pregnancy continuing beyond 2 weeks of the expected date of delivery (> 294 days) is called post-term pregnancy (postmaturity).

Q. How do you assess the well-being of the fetus when woman is postdated?

Ans. (i) Daily fetal movement counting (kick chart)
(ii) Cardiotocography and nonstress test
(iii) Biophysical profile
(iv) Modified biophysical profile
(v) Doppler study of umbilical artery.

Q. How do you diagnose postmaturity?

Ans. (i) Menstrual history—is important, provided the woman is very sure of her date and her cycles are regular.
(ii) Weight record—usually it remains stationary.
(iii) Girth of the abdomen—it gradually diminishes.
(iv) Obstetric palpation—uterus is full of fetus.

Internal examination: Cervix may be ripe.

Investigations:

(i) Sonography : Composite biometry (measurement of CRL in first trimester record if available, BPD, FL, AC, and HC) is of value for the assessment of maturity. Early USG scan is more valuable.
(ii) Amniocentesis—the biochemical and cytological parameters are helpful to assess true maturity of the fetus.

Q. How do you instruct the woman to maintain the kick chart?

Ans. She is asked to count the number of fetal movements three times a day, each of 1 hour duration (e.g. 1 hour each in the morning (8–9 am), afternoon (3–4 pm) and evening (8–9 pm). The total counts multiplied by 4 gives the total movements in 12 hours. When she feels no movements or less than 10 movements in 12 hours, she must report to her doctor. Absence of fetal movements is commonly followed by disappearance of FHR by next 24 hours.

Patient observation: Daily fetal movement counting (kick chart) showed diminished fetal movements (less than 10 in 12 hours).

Q. What would be your next plan of investigation?

Ans. Fetal monitoring by cardiotocography for nonstress tests.

Q. What are the risks if she does not go into labor by 42 weeks of pregnancy?

Ans. Risks are mainly to the fetus.

During pregnancy: Fetal hypoxia due to placental ageing and insufficiency, oligohydramnios and meconium stained liquor.

During labor: Asphyxia, meconium aspiration, shoulder dystocia, brachial plexus injury, birth trauma (due to big baby), intracranial damage (due to nonmoulding of head).

Following birth: Chemical pneumonitis (due to meconium aspiration), hypoxia.

Maternal: Increased morbidity due to operative delivery (LSCS or instrumental).

Q. What would be your next course of management if she does not go into labor spontaneously?

Ans. She is assessed clinically and is considered for induction of labor:

(i) **Cervix favorable (Bishop's score > 6)** → ARM ± oxytocin → vaginal delivery.

(ii) **Cervix unfavorable** → PGE₂ gel (0.5 mg) intracervical → cervix favorable → ARM ± oxytocin → vaginal delivery. Fetal monitoring during the course of labor is essential.

(iii) **Presence of any other obstetric complications with unfavorable cervix** → LSCS.

Q. How should a woman with postmature pregnancy be monitored when she goes into labor?

Ans. Labor should be monitored carefully and partographic plotting is to be maintained. Electronic fetal monitoring is preferred. Nonprogress of labor or presence of fetal distress indicates cesarean delivery.

Q. What is the significance of post-term pregnancy?

Ans. There is significant rise in perinatal mortality when the expected date crosses over 42 weeks. Stillbirth rate is increased from 0.35/1000 at 37 weeks to 2.12/1000 at 43 weeks (6-fold). Risks of meconium aspiration, asphyxia, shoulder dystocia and operative delivery are also high.

Q. How does a postmature baby look after birth?

Ans. (i) Skin is wrinkled

(ii) There is absence of vernix caseosa

(iii) Nails are protruding beyond the nail beds

(iv) Baby may be stained greenish-yellow (meconium).

CASE-10**FETAL GROWTH RESTRICTION (FGR)****Case Summary**

Mrs LM, 27 years old, P0+0+0+0, was seen in the antenatal clinic at 36 weeks of gestation. On general physical examination, she weighed 47 kg (her weight remained the same for last three visits), mild pallor and her BP measured 144/96 mmHg. Obstetric examination revealed : Uterus 32 weeks size, SFH measured 32 cm, single fetus, cephalic presentation, 3/5th of the head is palpable per abdomen. Liquor volume is reduced. On auscultation FHS is 146 beats/minute and it is regular.

Q. What is the most likely clinical diagnosis?

Ans. Small for gestational age, probably due to intrauterine growth restriction (Fig. 2.19).

Q. How do you diagnose IUGR clinically?

Ans. (i) Obstetric palpation—Fundal height is less, liquor volume is reduced and fetal mass is less when compared to the gestational age.
 (ii) Symphysis fundal height (SFH) is less by 4 cm or more.
 (iii) Maternal weight gain—is either stationary or falling.
 (iv) Measurement of the abdominal girth—either remains the same or may be less.

Q. How do you confirm the diagnosis?

Ans. Sonography is extremely useful. Fetal parameters measured are:

- (i) BPD, HC, AC, and FL for fetal biometry; estimated fetal weight.
- (ii) HC and AC ratio. Normally HC/AC is < 1 after 34 weeks of gestation. In asymmetric IUGR it is > 1 .
- (iii) Amniotic fluid volume: AFI < 5 indicates oligohydramnios. This is common in IUGR.
- (iv) Doppler velocimetry: Reduced, absent or reversed diastolic flow in the umbilical artery indicates fetal jeopardy. This is due to chronic placental insufficiency (see Fig. 2.20).



Fig. 2.19: Neonate with the features of intrauterine growth restriction

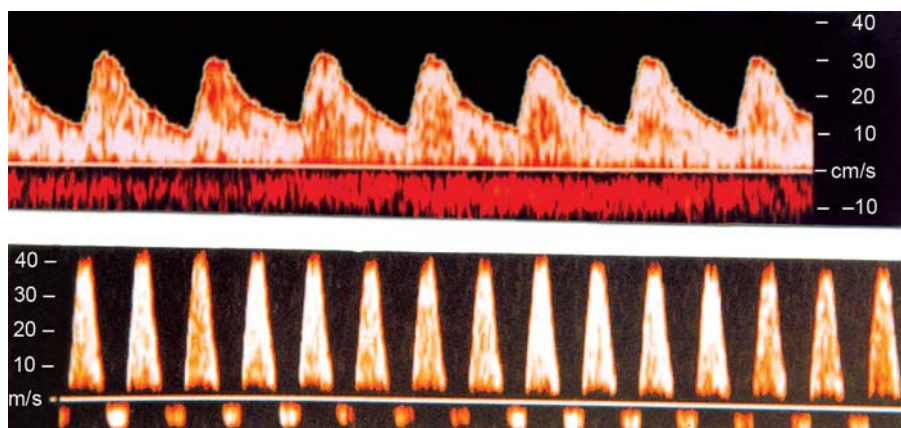


Fig. 2.20: Flow velocity waveform (Doppler velocimetry) of the umbilical artery showing normal forward flow (above) and reversed end diastolic flow (below)

Q. How should the fetus be monitored?

- Ans.**
- Daily fetal movement counting (kick chart)—normally it is > 10 in 12 hours.
 - Cardiotocography—for nonstress test (normally it is pattern).
 - Ultrasound scan for liquor volume (more than one vertical pool depth > 2 cm is normal) and for fetal structural abnormalities.
 - Biophysical profile—specially the nonstress test and amniotic fluid volume.
 - Doppler flow study of the umbilical artery and middle cerebral artery. Appearance of reversed end-diastolic flow velocity may lead to IUFD. Abnormal venous waveforms (pulsations in ductus venosus, IVC) indicates incipient cardiac failure. Increased peak systolic flow velocity in middle cerebral artery indicates redistribution of blood flow.

Q. What are the common causes of fetal growth restriction?

- Ans.**
- **Maternal**—Severe pre-eclampsia, nutritional deprivation, smoking and heart disease.
 - **Fetal**—Chromosomal abnormality and infection.
 - **Placental**—Infarction, placenta previa or chronic abruption.
 - **Idiopathic**—In majority.

Q. How do you manage a woman with IUGR?

- Ans.** General management includes : Adequate rest and balanced diet. Treatment of the etiological factor, if any, is to be done. Regarding delivery the following factors are considered:

- (i) Duration of pregnancy
- (ii) Degree of growth restriction
- (iii) Presence of any complicating factor
- (iv) The result of fetal monitoring.

Q. What should be the guideline to deliver such a patient?

Ans. It depends on the individual case. Factors to be considered here are duration of pregnancy, severity of IUGR, presence of other obstetric complications and result of the monitoring parameters.

- Pregnancy > 37 weeks: Delivery.
- Pregnancy < 37 weeks: Fetal monitoring (fetal well-being assessment).



1. No fetal compromise → continue till 37 weeks → with monitoring → delivery.
2. Fetal compromise detected → delivery in a tertiary care center. Pregnancy < 37 weeks, injection betamethasone to the mother to accelerate fetal lung maturation. The neonatologist should be involved.

Q. What should be the method of delivery?

Ans. It depends on the severity of IUGR and the Bishop's score (vaginal examination).

- (i) Bishop's score ≥ 6 = Induction of labor with PGE₂ gel followed by artificial rupture of membranes (ARM) and syntocinon augmentation. Fetal monitoring (clinical and preferably electronic) during labor is essential.
- (ii) Cervix unfavorable and/or gross IUGR → elective cesarean delivery.

Q. What are the perinatal complications in such a pregnancy?

Ans. Asphyxia, meconium aspiration, intrauterine fetal death, neonatal hypoglycemia, necrotizing enterocolitis, polycythemia, pulmonary hemorrhage.

Q. How on clinical examination does a neonate appear?

Ans. The important physical features are: skin is dry and wrinkled due to less subcutaneous fat. Abdomen is scaphoid. Umbilical cord is thin and may be stained with meconium. Plantar creases are well-developed. All these features give the baby an "old man look".

CASE-11**PRE-ECLAMPSIA AND ECLAMPSIA****Case Summary**

Mrs MR, 26 years old, was admitted in her first pregnancy at 34 weeks of gestation with BP of 150/96 mmHg and protein in the urine (+++). She was recorded normotensive (BP: 110/70 mmHg) and nonproteinuric in her early visits in the antenatal clinic. She had no symptoms. On general physical examination, there was no pallor but mild pedal edema was present. Her cardiovascular and respiratory systems were normal. Obstetric examination revealed : uterus 34 weeks, SFH 34 cm, single fetus, cephalic presentation, free, fetal back on the left, limbs on the right side. Liquor volume was adequate. On auscultation, FHS was 146 beats per minute and was regular.

Q. What is the clinical diagnosis?

Ans. Pre-eclampsia.

Q. What other important symptoms may she have?

Ans. Edema over the ankles, vulva (Fig. 2.21), abdominal wall and face. There may be headache, epigastric or right hypochondriac pain, oliguria or blurring of vision.

Q. Suggest few important investigations for her.

Ans. (i) Complete hemogram, urea and electrolytes.
(ii) Urine for 24 hours protein.
(iii) Coagulation profile: Serum fibrinogen level, PT and APTT.
(iv) LFTs: Serum AST, ALT and bilirubin.



Fig. 2.21: Massive vulval edema in pregnancy with pre-eclampsia



Fig. 2.22: Measurement of blood pressure of a pregnant woman is a routine in each antenatal examination

- (v) Serum uric acid (normal < 4 mg/dl).
- (vi) Serum creatinine (normal < 1 mg/dl).
- (vii) Platelet count (normal > 1.5 lacs/mm³).
- (viii) Ophthalmoscopic examination to detect any retinal edema, constriction of the arterioles, exudate or hemorrhage.
- (ix) Fetal monitoring : DFMC, USG for fetal growth, liquor pockets, nonstress test and biophysical profile depending upon the situation.

Q. Mention few important hematological abnormalities of the patient.

Ans. Thrombocytopenia (platelet count is < 100000/mm³), hemolysis, hemoconcentration and DIC.

Q. What is the basic pathology of this clinical problem?

Ans. Endothelial dysfunction and vasospasm.

Q. What are the risk factors for the development of pre-eclampsia?

- Ans.**
- (i) Primigravida (first-time exposure to chorionic villi)
 - (ii) Positive family history
 - (iii) Exposure to superabundance of chorionic villi (twins and molar pregnancy)

- (iv) Genetic (polygenic disorder)
- (v) Pre-existing vascular or renal disease
- (vi) Thrombophilia
- (vii) Immunological maladaptation
- (viii) New paternity.

Q. What is severe pre-eclampsia?

- Ans.** (i) Level of blood pressure systolic > 160 mmHg and/or diastolic > 110 mmHg.
- (ii) Headache
 - (iii) Blurring of vision
 - (iv) Persistent epigastric pain
 - (v) Oliguria (urine volume < 400 ml in 24 hours)
 - (vi) Massive proteinuria (> 5 gm/day or $\geq 3+$)
 - (vii) Low platelet count (< 100,000/mm³)
 - (viii) HELLP syndrome
 - (ix) Retinal pathology—hemorrhage, exudate
 - (x) IUGR
 - (xi) Pulmonary edema.

Q. What are the complications of pre-eclampsia?

Ans. Complications are both to the mother and the fetus.

| Maternal | Fetal |
|---|--|
| <ul style="list-style-type: none"> ♦ Eclampsia ♦ Cerebrovascular accident ♦ Abruptio placentae ♦ DIC ♦ Oliguria, anuria and renal failure ♦ Pulmonary edema ♦ HELLP syndrome ♦ Hepatic failure ♦ Blurring of vision and blindness ♦ Preterm labor ♦ PPH ♦ Death | <ul style="list-style-type: none"> ♦ IUGR ♦ Preterm delivery and prematurity ♦ Asphyxia ♦ IUFD ♦ Oligohydramnios ♦ Increased perinatal death |

Q. How do you manage a case of pre-eclampsia?

- Ans.** (i) To control blood pressure—Antihypertensive (labetalol, methyldopa, nifedipine or hydralazine).
- (ii) Fetal monitoring and other investigations (mentioned earlier).
- (iii) Blood pressure controlled → to continue pregnancy till 37 completed weeks → termination of pregnancy (either by induction of labor or by cesarean section).
- (iv) Blood pressure not controlled or rising → termination of pregnancy irrespective of duration of pregnancy.
(Termination may be done either by induction of labor when Bishop's score is favorable or by cesarean section).
- (v) Presence of ominous symptoms like headache, blurring of vision, epigastric or right hypochondriac pain, falling platelet count, rising blood pressure and in spite of medical therapy.

Urgent delivery irrespective of gestational age.

In such a situation patient should be given:

- (A) Betamethasone to accelerate pulmonary maturity.
- (B) Antiseizure prophylaxis— MgSO_4 is to be started (IM or IV regimen).

Q. What is eclampsia?

Ans. Woman with pre-eclampsia when complicated with convulsions and/or coma is called eclampsia.

Q. What are the different types of eclampsia?

- Ans.** (i) Antepartum (majority 50%)
- (ii) Intrapartum (30%)
- (iii) Postpartum (20%).

Q. What are the different stages of convulsion in eclampsia?

Ans. (i) Premonitory stage, (ii) tonic stage, (iii) clonic stage, and (iv) stage of coma.

Q. What are the maternal complications of eclampsia?

- Ans.** (i) Pulmonary: Edema, pneumonia, ARDS (ii) Cardiac: LVF
- (iii) Renal: Oliguria, anuria and renal failure
- (iv) Hepatic: Subcapsular hematoma, hepatic cell necrosis and jaundice
- (v) Eyes: Retinal detachment and blindness
- (vi) Cerebral: Encephalomalacia, hemorrhage, edema
- (vii) Injuries: Tongue bite (Fig. 2.23), injuries from fall, bed sore.

Postpartum: • Sepsis • Psychosis • Shock.

Fetal: • Prematurity • Asphyxia • IUD • Increased perinatal morbidity and mortality.

Q. What anticonvulsant regime is commonly used for the management?

Ans. Magnesium sulfate (MgSO_4 , 7 H₂O) is the drug of choice. It has got excellent result. Maternal mortality is of 0.4%. It is to be continued for 24 hours after last seizure or delivery, whichever is later. The woman is monitored clinically by presence of knee jerks, urine output (p. 210) (> 30 ml/hour) and respiration rate (> 14/minute). Monitoring is done so that toxicity is avoided.

Q. What are the common causes of maternal death in eclampsia?

Ans. (i) Cardiac failure, (ii) pulmonary edema, (iii) aspiration, (iv) cerebral hemorrhage, (v) renal failure, (vi) postpartum shock and (vii) puerperal sepsis.

Q. What are poor prognostic factors of eclampsia?

Ans. (i) Late referral (delay in start of treatment)
 (ii) Number of fits > 10
 (iii) Coma in between fits
 (iv) Temperature > 102°F, pulse > 120/minute
 (v) Prolonged admission delivery interval
 (vi) Pulmonary edema
 (vii) Blood pressure > 200 mmHg systolic
 (viii) Oliguria
 (ix) Proteinuria > 5 gm/24 hours
 (x) Poor response to treatment
 (xi) Appearance of jaundice.

Case discussion continued—

The same patient as discussed on p. 58, was seen after four days, her BP record was 160/120 mmHg and proteinuria persisted. She complained of right upper abdominal pain.

Q. What is the possible diagnosis?

Ans. Severe pre-eclampsia.

Q. What complications might she develop if left untreated?

Ans. Eclampsia, abruptio placentae, renal failure, HELLP syndrome, and cerebrovascular accident.

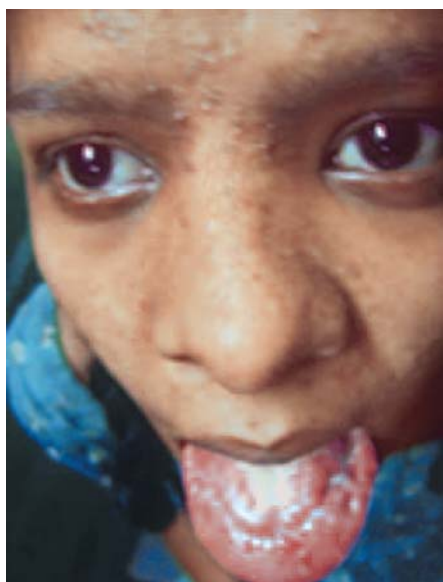


Fig. 2.23 : Extensive bite of the entire tongue following repeated eclamptic convulsions in labor. This patient suffered tuberous sclerosis. Cutaneous angiofibromas are seen

Q. What immediate management should she have?

- Ans.** (i) Control of blood pressure: Antihypertensive drug to be started. Labetalol (IV), injection hydralazine (IV), or Ca-channel blocker.
- (ii) To prevent fits: Prophylactic anticonvulsive therapy—magnesium sulfate (IM/IV regimen).
- (iii) To administer steroid to accelerate fetal lung maturity (pregnancy < 37 weeks).
- (iv) To monitor the fetus and to organize delivery.

Q. What are the possible fetal complications in this condition?

- Ans.** IUGR, IUFD and problems of prematurity, if delivered before term.

Q. What is HELLP syndrome?

- Ans.** HELLP is an acronym for a syndrome of hemolysis, elevated liver enzymes and low platelet count. It is considered as the severe variety of pre-eclampsia.
- H = Hemolysis (abnormal peripheral blood smear)
- EL = Elevated liver enzymes (SGOT > 121 U/l; LDH > 600 U/l)
- LP = Low platelet count (< 100,000/mm³)

Q. What are the maternal complications of HELLP syndrome?

- Ans.** ♦ Pulmonary edema
- ♦ Acute renal failure
- ♦ DIC
- ♦ Abruptio placenta
- ♦ Liver
- Infarction; hepatic rupture
 - Subcapsular liver hematoma
- ♦ ARDS
- ♦ Stroke
- ♦ Sepsis
- ♦ Maternal mortality rate is 1%.

Q. What are the laboratory observations in HELLP syndrome?

- Hemolysis in HELLP is characterized by:
 - Peripheral smear (schistocytes, burr cells)
 - Severe anemia not due to blood loss
- Elevated liver enzymes
 - AST
 - ALT Levels ≥ twice the normal
 - LDH
- Low platelets : (<100,000/mm³)

Q. What is the management of HELLP syndrome?

- Ans.** ■ Urgent hospitalization
- Tertiary care center (preferred)
- Investigations to organize as in severe pre-eclampsia
- Antiseizure prophylaxis: MgSO₄
- Antihypertensive drug
- Delivery: (Corticosteroids: when pregnancy < 37 weeks).

Q. What are the important medical management HELLP syndromes?

Ans. Plasma volume expansion:

- IV infusion—Crystalloids
- Colloids—Albumin (5%)
- Antithrombotic agent—Heparin
- Fresh frozen plasma
- Platelet transfusion
 - Platelet count $<20,000/\text{mm}^3$
 - Presence of bleeding (bleeding gums).

Q. Is there any risk of recurrence of pre-eclampsia in subsequent pregnancy?

Ans. Yes. Risk of recurrence in next pregnancy is about 25%.

CASE-12 PREGNANCY IN A RHESUS NEGATIVE WOMAN**Case Summary**

Mrs GT, P0+0+0+0, at 36 weeks of gestation was seen in the antenatal clinic. Her obstetric examinations were within normal limits. Investigation reports revealed that her blood group was A rhesus negative while her husband was group B rhesus positive.

Q. What is the basic underlying pathology of rhesus isoimmunization?

Ans. When Rh-positive red cells of the fetus enter into the maternal circulation, they generate antigenic response to produce antibodies by the reticulo-endothelial system. At least 0.1 ml of fetal blood and about 6 months are required to produce detectable antibodies. These antibodies (IgG), when they enter the fetal circulation (crossing the placental barrier), agglutinate the fetal red cells, which are ultimately removed by the reticuloendothelial cells. Fetal affection depends upon the degree of agglutination and destruction of fetal red cells.

Q. What is the chance that this baby will be affected due to rhesus problem?

Ans. In a primigravida, who is otherwise uncomplicated, it is unlikely that the baby would be affected due to rhesus problem (for reasons see below).

Q. Under what circumstances may even the mother in her first pregnancy be sensitized?

Ans. History of amniocentesis, chorionic villus sampling, antepartum hemorrhage, threatened miscarriage, external cephalic version, blood transfusion with rhesus positive red cells.

Q. What test should be done to detect isoimmunization status?

Ans. Detection of antibodies in maternal blood by indirect Coombs' test (ICT).

Q. How is the immune response of a Rh-negative woman to Rh D positive red cells?

Ans. The response may vary in an individual. The response may be any of the following three varieties.

1. **Responders (60–70%):** Who develop an antibody to a small volume of red cells.
2. **Hyperresponders:** Who develop antibodies even with a very small volume of red cells.
3. **Poor responders (10–20%):** Who respond to develop antibodies with a very large volume of red cells.
4. **Nonresponders (10–20%):** Individuals who do not respond to any amount of red cell transfer.

The time taken to develop anti-D antibody following a sensitizing event is 5 to 16 weeks.

Q. What is the critical titer?

Ans. A critical titer is the anti-red cell antibody titer that is associated with significant risk of hydrops fetalis. In most center a critical titer for anti-D antibody is 16 (dilution of 1:16 is equivalent to a titer of 16).

Q. If the ICT is positive, what should be the next course of action?

- Ans.**
- Quantitative estimation of antibody (albumin) at weekly interval.
 - Antibody titer 1/16th is considered critical titer (some center) or antibody level < 4 IU/ml (automated measurement) is considered safe.
 - Genotype of the husband.
 Husband \rightarrow homozygous \rightarrow fetus is likely to be affected.
 Husband \rightarrow heterozygous \rightarrow fetus is affected only in 50% cases.

Q. How could the severity of the disease be assessed?

- Ans.** Amniocentesis or by fetal blood sampling (cordocentesis) or middle cerebral artery (MCA) Doppler velocimetry.

Amniocentesis: Optical density (OD) difference of **amniotic fluid** at 450 nm is assessed. In presence of bilirubin there is a 'deviation bulge' (Figs 2.24A and B). Higher the bulge, more severe is the fetal affection. The spectrophotometric "deviation bulge" at ΔOD_{450} is plotted in Liley's chart and accordingly the management is formulated.

Zone A — To continue pregnancy to term (Hb > 11.0 gm/dl).

Zone B — Pregnancy termination after 34 weeks (Hb 8.0 – 10.9 gm/dl).

Zone C — Severe fetal affection (Hb < 8.0 gm/dl).

- Pregnancy > 34 weeks — Delivery.
- Pregnancy < 34 weeks \rightarrow Cordocentesis and intrauterine fetal transfusion (when hematocrit 30%) till 34 weeks.

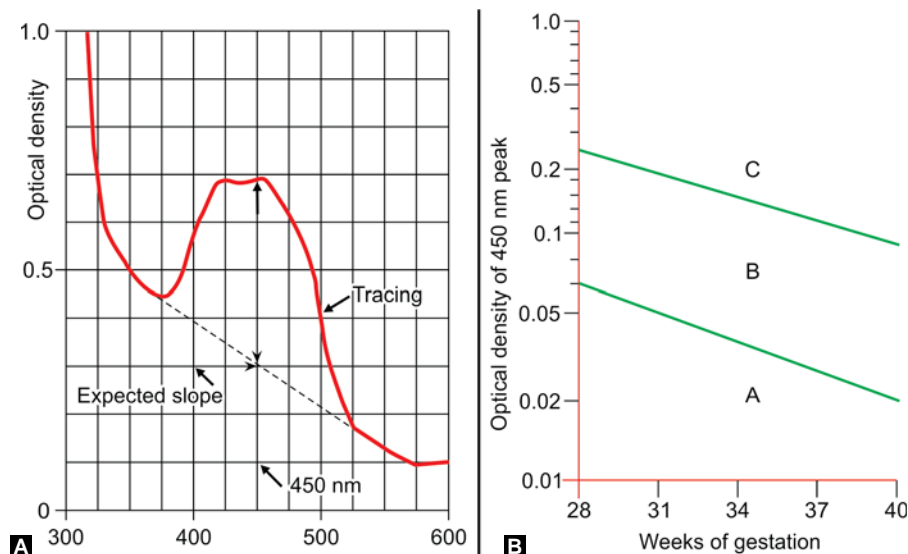


Fig. 2.24A: Spectrophotometric analysis of amniotic fluid showing optical density difference at 450 nm wavelength with "deviation bulge" in Rh hemolytic disease

Fig. 2.24B: Plotting of the "deviation bulge" in Liley's prediction chart at different periods of gestation. Currently Liley's graph is modified (Queenan – 1993) that begins at 14 weeks of pregnancy

Cordocentesis—It can assess the degree of fetal affection more correctly compared to amniocentesis. A fetus with hemoglobin deficit 2 gm/dl or more from the mean value of the corresponding gestational age (hematocrit < 30%) should be transfused.

Intrauterine fetal transfusion may be either by—(a) Intraperitoneal or (b) intravascular (umbilical vein) route.

Q. What are the benefits and the risks of cordocentesis in the management?

Ans. Benefits of cordocentesis or funipuncture:

- Fetal blood ABO, Rh type, hematocrit, direct Coombs' test, reticulocyte count and total bilirubin level can be determined.
- Risks are: Cordocentesis has got the risk of fetal loss (1–2%) and fetomaternal hemorrhage in 50% of cases. For this reason, it is done only in patients with elevated peak MCA Doppler velocities.

Q. What are the sonographic findings in a fetus that is affected due to rhesus alloimmunization?

Ans. Serial ultrasound scan reveals: Increased amniotic fluid volume, hepatosplenomegaly, placental thickness > 4 cm, echogenic bowel, scalp edema, cardiomegaly with increased cardiac chambers, pericardial effusion, ascites, umbilical vein dilation and fetal edema (hydrops). Scalp edema, presence of hydrops indicates severe fetal anemia.

Q. What is the significance of middle cerebral artery (MCA) Doppler ultrasound?

Ans. Peak velocity of systolic blood flow in the MCA is increased (preferential redistribution) when the fetus is anemic due to rhesus alloimmunization. MCA Doppler flow velocity is used as a noninvasive method to detect fetuses with moderate to severe affection. Value of MCA peak systolic velocity > 1.5 MoM, suggests fetal anemia. Cordocentesis and intrauterine fetal transfusion may be needed depending upon the severity of anemia.

Q. What are the fetal complications that may occur when mother is immunized?

Ans. **Hemolytic disease of the fetus and newborn (HDFN)** depends upon the severity of the pathological process. It may cause:

- a. **Hydrops fetalis:** It is severe form of the hemolytic disease. Either there is intrauterine fetal death or early neonatal death due to cardiac failure.
- b. **Icterus gravis neonatorum:** It is less severe form of the fetal hemolysis. Baby develops jaundice soon following birth.
- c. **Congenital anemia of the newborn:** It is the mild form of the disease. The underlying pathology of the hemolytic disease:
Hemolytic anemia → tissue (organ) hypoxemia.
Liver damage → hypoproteinemia → cardiac failure → fetal hydrops → IUFD.

Q. What neonatal complications may occur after the delivery?

Ans. Icterus gravis neonatorum, congenital anemia of the newborn, neonatal jaundice and kernicterus.

Q. What treatment might the fetus/neonate need if found affected?

Ans. • Intrauterine fetal transfusion either intraperitoneal or intravascular.
• Exchange blood transfusion of the neonate.
The blood should be group O and Rh-negative.

Q. What special investigations would be done for this baby following birth?

Ans. Cord blood sample to be taken.
Cord blood investigations are: Hb%, Hematocrit, Reticulocyte count, ABO grouping, Rh typing, direct Coombs' test and serum bilirubin.

Q. What measure should be taken to prevent active immunization of the mother?

Ans. If the baby is rhesus positive, anti-D gammaglobulin 300 µg IM is given to the mother within 72 hours of delivery.

Q. What is the best way to assess the dose of anti-D?

Ans. By measuring extent of fetomaternal hemorrhage by performing 'Kleihauer count' (acid elution test). The dose of Rh immunoglobulin calculated is 10 µg for 1 ml of fetal blood when fetomaternal hemorrhage is > 30 ml.

Q. What could be the reason that the first pregnancy is often not affected?

Ans. In majority of cases, fetomaternal hemorrhage occurs predominantly during the course of labor and delivery. Detectable antibodies usually develop 2–4 months after the episode of fetomaternal bleed. Thus, the first pregnancy is not generally affected. However, antepartum sensitization may occur in small percentage of cases (1–2%).

Q. What are the other conditions where prophylactic anti-D is needed to prevent Rh-alloimmunization?

Ans. A. **Early pregnancy:** (i) Miscarriage, (ii) MTP, (iii) ectopic pregnancy and (iv) molar pregnancy.
B. **Procedures:** (i) CVS (ii) genetic amniocentesis and (iii) Cordocentesis.
C. **Others:** (i) External cephalic version, (ii) manual removal of placenta and (iii) placental abruption.

Q. What could be the reason that anti-D prophylaxis is not needed for such a mother?

Ans. If the baby is rhesus negative.

Q. Is there any place of prophylactic anti-D therapy during pregnancy?

Ans. Yes. To combat any fetomaternal hemorrhage during pregnancy. It is currently recommended to give 300 µg anti-D immune globulin at around 28 weeks of pregnancy. However, after birth, it is again given 300 µg within 72 hours.

Q. Why are not all the babies born following Rh incompatibility affected?

Ans. (i) Inborn inability to respond to the Rh antigenic stimulus.
(ii) The particular woman may be immunologic nonresponder.
(iii) There may be associated ABO incompatibility.

- (iv) Variability of Rh antigenic stimulus depending upon the genotype of the fetus.
- (v) Less volume of fetal blood entering into the maternal circulation. Minimal volume required is 0.1 mL.
- (vi) Fetal response to maternal antibodies varies on fetal sex. Rh-D positive male fetuses run the higher risk of severe hemolysis and death, compared to a female fetus.

Q. What care during delivery can minimize the risk of fetomaternal hemorrhage?

Ans. a. During labor—

- (i) Not to give prophylactic ergometrine during second stage of labor.
- (ii) Gentle handling of the uterus during the third stage.

b. During cesarean delivery—

- (i) To avoid blood spillage into the peritoneal cavity.
- (ii) To avoid routine manual removal of the placenta.

c. Early cord clamping.

Q. What are the indications of exchange transfusion in the newborn?

Ans. Rh-positive with direct Coombs' test positive babies having:

- (i) Cord blood bilirubin level > 4 mg/dl and hemoglobin level is < 11 gm/dl.
- (ii) Rising rate of bilirubin over 1 mg/dl/hour despite phototherapy.
- (iii) Total bilirubin level is 20 mg/dl or more.



Fig. 2.25: Candidate demonstrates the method to centralize the uterus for the measurement of correct uterine height

Q. What are the objectives of exchange transfusion?

- Ans.** (i) To correct anemia and to prevent cardiac failure.
(ii) To remove the circulatory antibodies.
(iii) To remove the circulatory bilirubin.

Q. What is the type, nature and amount of blood to be transfused?

- Ans.** (i) Rh negative, whole blood with the same blood group to that of the baby or with group 'O'.
(ii) It should be relatively fresh.
(iii) The amount is about 160 ml/kg body weight of the baby.

Q. Can the mother breastfeed the baby?

- Ans.** Yes, there is no contraindication to breastfeeding.

CASE-13 MULTIPLE PREGNANCY

Case Summary

Mrs YM, P0+0+0+0, 27 years old, pregnancy following induction of ovulation, was admitted at 36 weeks of gestation with occasional dyspnea due to huge enlargement of the abdomen. On clinical examination she had mild pedal edema; BP 140/94 mmHg. Her cardiovascular and respiratory system examination was normal. Obstetric examination revealed symphysiofundal height of 40 cm and abdominal girth at the level of umbilicus was 120 cm. Difficulties were faced in palpating the fetal parts. Too many fetal parts were felt. On auscultation, two fetal heart sounds could be heard at two different sites. One over the right spinoumbilical line and the other over the left spinoumbilical line at a higher level.

Q. What is the likely diagnosis?

Ans. Multiple pregnancy and/or polyhydramnios.

Q. How can you confirm the diagnosis?

Ans. Ultrasound scan of the gravid uterus.
The USG scan is shown in figure 2.26.

Q. What is the diagnosis?

Ans. Twin pregnancy.

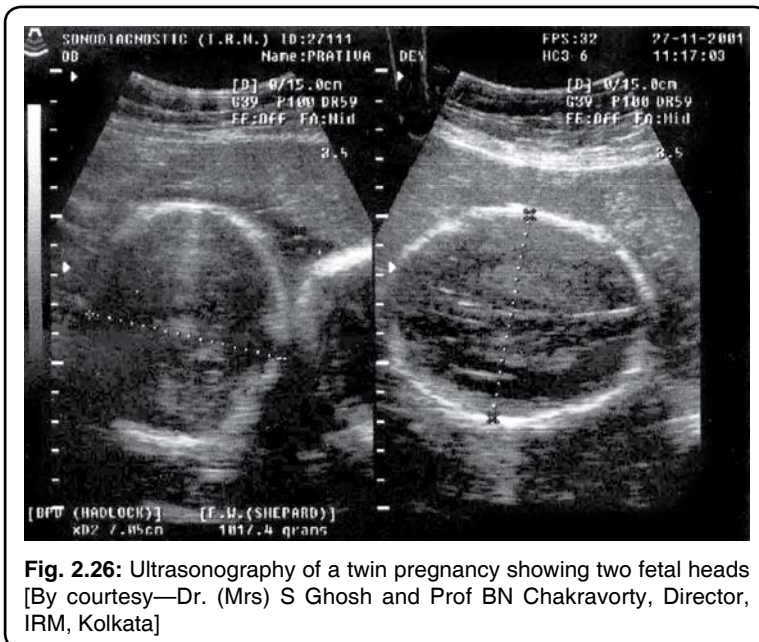


Fig. 2.26: Ultrasonography of a twin pregnancy showing two fetal heads [By courtesy—Dr. (Mrs) S Ghosh and Prof BN Chakravorty, Director, IRM, Kolkata]

Q. How can you suspect the diagnosis of twin pregnancy clinically?

- Ans.**
- a. **From the history:** (i) Use of ovulation inducing drugs and (ii) Family history of twinning.
 - b. **Symptoms:** Increased nausea, vomiting, cardiorespiratory embarrassment, pedal edema, unusual enlargement of the abdomen.
 - c. **Signs:**
 - (i) Unusual weight gain
 - (ii) Pre-eclampsia—early onset.
 - (iii) Fundal height more than the period of amenorrhea.
 - (iv) Abdominal girth (at umbilicus) is more than 100 cm.
 - (v) Palpation of too many fetal parts.
 - (vi) Findings of two fetal heads or three fetal poles of the uterus.
 - d. **Auscultation:** Two distinct fetal heart sounds heard at two separate sites by two observers with a difference in heart rates by at least 10 beats/minute.

Q. What additional information can be obtained on ultrasonography besides the presence of two fetuses?

- Ans.**
- (i) Number and viability of the fetuses.
 - (ii) Chorionicity (lambda or twin peak sign).
 - (iii) Gestational age and weight of the fetuses.
 - (iv) Fetal malformations.
 - (v) Presentation and lie of the fetuses.
 - (vi) Twin transfusion.
 - (vii) Placental localization.
 - (viii) Amniotic fluid volume.

Q. What are the common maternal complications during pregnancy?

Ans.

- | | |
|-------------------------|--|
| ♦ Nausea, vomiting | ♦ Anemia |
| ♦ PIH and pre-eclampsia | ♦ Polyhydramnios/oligohydramnios |
| ♦ Preterm labor | ♦ Malpresentation |
| ♦ Antepartum hemorrhage | ♦ Mechanical distress (dyspnea, palpitation) |
| ♦ Prolonged labor | ♦ Operative interference |
| ♦ Postpartum hemorrhage | ♦ (↑) Postnatal support |

Q. What are the different combinations of twin presentations?

Ans. The following combinations are in the descending order of frequency:

- (i) Both cephalic (most common 40% and most favorable)
- (ii) First cephalic, second breech (26%)
- (iii) Both breech (10%)
- (iv) Cephalic and transverse lie (8%)
- (v) Breech and transverse lie
- (vi) Both transverse lie.

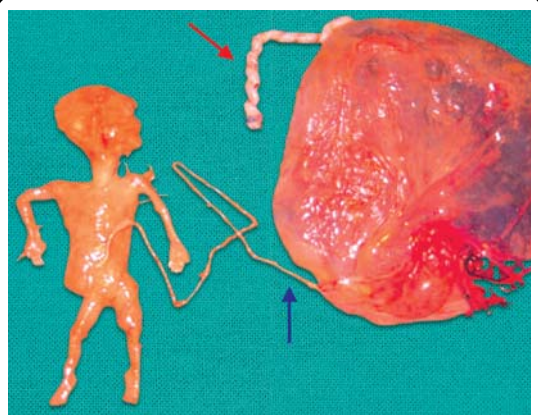


Fig. 2.27: Fetus papyraceus, umbilical cord of the live fetus (red arrow) and that of the lead (blue arrow) are seen

Q. What are the common fetal complications? Why is twin pregnancy considered high risk?

Ans. See p. 215.

| | |
|---|--|
| ♦ Miscarriage | ♦ Vanishing twin |
| ♦ Preterm birth | ♦ Fetus papyraceus (Fig. 2.27) |
| ♦ Discordant growth | ♦ Fetal anomalies (Figs 2.28 and 2.29) |
| ♦ Twin-twin transfusion syndrome | ♦ Intrauterine death of one fetus |
| ♦ Locked twins | ♦ Cord prolapse |
| ♦ (↑) Perinatal mortality (complications are more in monochorionic twins) | |

Q. How would you organize the management of the woman during her antenatal period?

Ans. Considering the number of complications both to the mother and the fetus — **twin pregnancy is a high risk one.**

The antenatal management protocol should be:

- (i) Diet—Increased dietary supplementation (additional 300 kcal/day).
- (ii) Increased rest at home and early cessation of work.
- (iii) Increased supplement therapy of iron (100–200 mg/day), folic acid, calcium and vitamins.
- (iv) Regular antenatal visit—Sometimes it may be frequent at an interval of 2–3 weeks.
- (v) Fetal monitoring—Clinical and by serial sonography at 3–4 weeks interval.

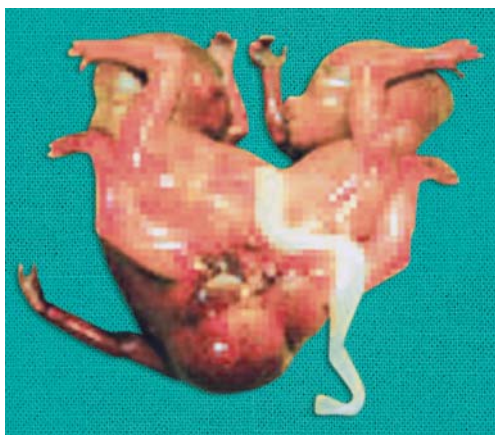


Fig. 2.28: Conjoint twins—showing pyopagus (joined from umbilicus to the buttocks). [By courtesy: Prof BN Chakravorty, Director, IRM, Kolkata]



Fig. 2.29: Acephalus, acardiac fetus in a twin pregnancy. [By courtesy: Dr A Mukherjee, Gynecologist, Purulia Hospital, West Bengal, India]

Hospitalization: Routine hospital admission for bed rest is not essential. Early cessation of work and rest at home is helpful. Emergency admission for any complication (e.g. preterm labor) may be needed any time during pregnancy.

Q. What is fetus papyraceus or compressus?

Ans. This is a situation where one fetus dies in early pregnancy. The dead fetus is flattened, mumified and compressed between the membranes of the living fetus and the uterine wall. It is detected by sonography or seen after delivery.

Q. What precautionary measures should be taken when she goes into labor?

Ans. Twin pregnancy is a high risk one. Women with twins should be delivered preferably at an equipped center having an intensive neonatal care unit. An intravenous line with Ringer's solution is started. Arrangement is made for availability of one unit of cross-matched blood to ensure the availability of the senior obstetrician, the anesthetist and the neonatologist.

Q. What would be the steps of management following birth of the first baby?

Ans. ■ **Twin A** → Vertex → deliver vaginally.

↓ **No methergin**

- Twin B → Vertex → ARM ± oxytocin → deliver vaginally
- Twin B → Breech → ARM ± oxytocin → assisted breech delivery
- Twin B → Transverse External cephalic version (ECV) → ARM ± oxytocin → vaginal delivery.
External cephalic version (ECV) →
Fails → Internal podalic version (IPV) → followed by breech extraction.
- Average delivery interval between Twin A and Twin B is 15–20 minute.
- Injection methergin 0.2 mg IV is given soon following the birth of the second baby. To continue IV oxytocin infusion after delivery of the placenta.
- **Twin A** → nonvertex → cesarean delivery.

Q. What are the second stage complications of twin pregnancy?

- Ans.**
- Cord prolapse of the twin B.
 - Placental abruption after delivery of twin A.
 - Retention of twin B due to premature closure of the cervix.
 - Intrapartum hemorrhage.
 - Locked twins (rarely) (Fig. 2.30).

Q. What is the most common complication in the third stage of labor?

Ans. Primary postpartum hemorrhage due to uterine atony.

Q. What are the indications of cesarean section in twin pregnancy?

Ans.

- When both the twins or the first twin is with noncephalic presentation (breech or transverse).
- Twins with estimated weight 2000 gm or less.
- Monoamniotic twins.
- Monochorionic twins with TTTS.
- Pregnancy complications — severe pre-eclampsia, previous cesarean section (obstetric indications).
- Conjoint twin (Fig. 2.31).

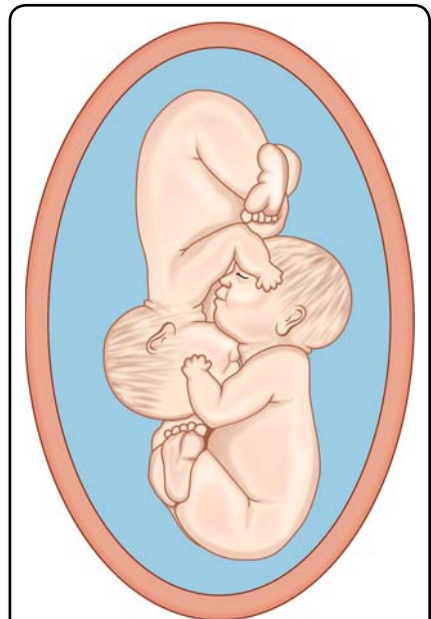


Fig. 2.30: Interlocking of twins between the aftercoming head of first baby with the forecoming head of the second baby

Q. Which type of twins are associated with higher rate of complications?

Ans. Monochorionic twins.

Q. What are the complications of monochorionic twins?

Ans.

- Congenital fetal malformations
- Twin-to-twin transfusion syndrome (TTTS)
- Polyhydramnios
- IUGR
- Dead fetus syndrome
- Conjoint twin
- Twin reversed arterial perfusion or acardiac twin (Fig. 2.29)
- Increased perinatal mortality.

Q. What is the membrane status of dizygotic twins?

Ans. • Dizygotic (DZ) twins are always dichorionic and diamniotic as they result from fertilization of two different ova.

Q. What is the membrane status in monozygotic twins?

Ans. It depends upon the time of twinning division following fertilization. The possibilities are:

- a. Division <72 hours: diamniotic dichorionic (D/D)
- b. Division between 4th day and 8th day: Diamniotic monochorionic (D/M)
- c. Division >8 days: Monoamniotic monochorionic (M/M)
- d. Division > 2 weeks: Conjoint twins.

Q. What is meant by vanishing twin and selective fetal reduction?

Ans.

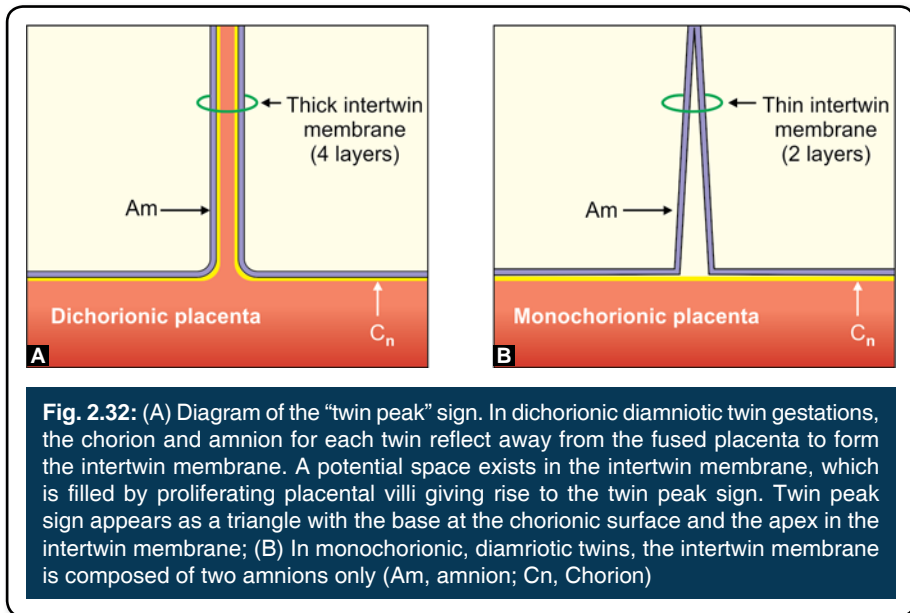
- Intrauterine death of one fetus before 14 weeks usually results in complete resorption, as if the fetus has vanished.
- To improve fetal survival in multifetal pregnancy (specially following assisted reproductive technique), selective fetal reduction is done when there are 4 or more fetuses. Generally two fetuses are allowed to grow and the rest are destroyed.

Q. How can you diagnose chorionicity of twin pregnancy and what is its significance?

Ans. Ultrasound scan around 10–12 weeks can identify “twin peaks” or “Lambda” sign a projection of placental tissue that grows into the interchorionic space of the two placentas. Presence of “twin peaks” sign indicates dichorionic placenta. Thickening of the intervening membrane > 2



Fig. 2.31: Dichorionic, diamniotic twin gestation—“twin peak sign”. Thick intertwin membrane confirms dichorionicity (arrows)



mm indicates dichorionic and diamniotic twins (Figs 2.31 and 2.32A and B). It is the “**chorionicity**” not the “Zygosity” which is related to the degree of complications. This is the clinical significance.

Q. What are the complications of TTTS?

Ans. Death of one or both the fetuses, depending upon the severity of the pathology.

Q. How can you manage a pregnancy with twin-to-twin transfusion?

- Ans.**
- **Repeated amnio reduction** in the recipient twin to control polyhydramnios.
 - **Laser photocoagulation** of the anastomotic vessels or laser division of the placenta.
 - **Septostomy** of the inter-twin membrane to make a hole between the two sacs. Septostomy equalises the amniotic fluid pressure between the two sacs.
 - **Selective feticide** by occlusion of the umbilical cord of the worse affected fetus to prevent exsanguination into the dead twin and placenta.

CASE-14**INTRAUTERINE FETAL DEATH (IUFD)****Case Summary**

Mrs CM, 23 years old, $P_{0+0+0+0}$ is admitted at 36 weeks pregnancy with the complaints of loss of fetal movements for the last 2 days. She had irregular antenatal supervision in the pregnancy. On examination she is pale (mild), BP is 150/94 mmHg with pedal edema. Obstetric examination revealed : Uterus 36 weeks size, uterus felt flaccid, single fetus, cephalic presentation. Clinically, liquor volume appeared to be reduced, FHS could not be localized on repeated examination using a stethoscope and also with a hand-held Doppler.

Q. What is your provisional diagnosis?

Ans. The mother could not feel fetal movements for the last 2 days and the FHS could not be localized by repeated auscultation with a stethoscope or a hand-held Doppler. This raises the clinical suspicion of intrauterine demise of the fetus. However, the diagnosis needs to be confirmed by other investigations.

Q. What other investigations do you recommend to confirm the diagnosis?

Ans. Earliest diagnosis can be made by ultrasonography. Real time sonography is essential for accurate diagnosis of IUFD (RCOG-2011). Absence of fetal cardiac motion (real time) and all other body movements for a period of 5–10 minutes of careful observation with real time sonography is a presumptive evidence of fetal death.

Auscultation of FHR by stethoscope (Pinard) or Doppler is not accurate for diagnosis.

Other secondary features (on radiology) might be seen.

Spalding sign — Irregular overlapping of cranial bones

(i) Hyperflexion of the spine

(ii) Crowding of the ribs

(iii) Appearance of gas shadow in the heart chambers and blood vessels (Robert's sign)

Usually these features take some time (7–10 days) to appear, except the Robert's sign (12 hours)

Q. What are the common causes of IUFD?

Ans. The fetal deaths are due to complications in pregnancy related to the mother, fetus or the placenta. The important causes are:

(A) Maternal (5–10%)

- Hypertensive disorders
- Diabetes (Fig. 2.33)
- Maternal infections (malaria)
- Severe anemia
- Hyperpyrexia
- Antiphospholipid syndrome.

(B) Fetal (25–40%)

- ♦ Chromosomal abnormalities
- ♦ Infections (rubella and CMV)
- ♦ Rh-incompatibility
- ♦ Birth defects (Fig. 2.34)

(C) Placental (25–35%)

- ♦ Antepartum hemorrhage
- ♦ Cord accident (true knot)
- ♦ Placental insufficiency

(D) Unexplained (10–35%)

Fig. 2.33: Stillborn baby weighing 5.1 kg (macrosomic) of an uncontrolled diabetic mother

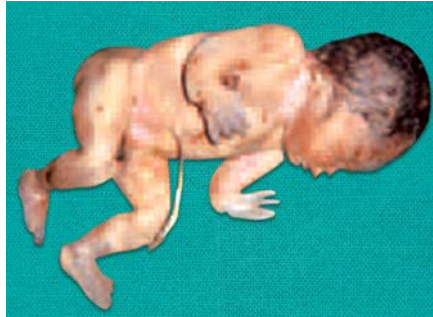


Fig. 2.34: IUD due to multiple congenital (skeletal and visceral) malformations

Q. What are the clinical features suggestive of IUD ?

Ans. Symptoms: Absence of fetal movements as noted by the mother.

Signs: Per abdomen:

- a. Regression of fundal height
- b. Uterine tone diminished
- c. Fetal movements not felt during palpation
- d. FHS is absent.

Investigations: Absence of cardiac motion on ultrasonography using **real time** is a strong presumptive evidence of fetal death.

Q. What are the complications that may arise due to IUD ?

Ans. (i) Psychological upset of the woman, (ii) onset of infection, (iii) blood coagulation disorders (rare), (iv) during labor—uterine inertia, retained placenta and postpartum hemorrhage.

Q. How are you going to manage the woman with the IUD ?

Ans. In about 80% of cases spontaneous expulsion occurs within 10–14 days of the fetal death. In certain cases interference is needed. Termination of pregnancy when required should always be done by medical induction (oxytocin or/and prostaglandin).

Methods of induction are: Clinical examination of the woman including pelvic examination is done.

A. Cervix favorable → Oxytocin infusion (IV)

Few cases may need repeat oxytocin (IV)

B. Cervix unfavorable → PGE₂ gel intracervical or PGE₁ tab 25 mcg–50 mcg vaginally (may be repeated after 6–8 hours). Tablet, Mifepristone (200 mg) orally followed by vaginal PGE₁, has been found very effective. This regimen may be used as the first line choice.

Few patients may need oxytocin infusion in addition to vaginal prostaglandins
C. Once delivery occurs—Evaluation of the stillbirth infant is to be done and bereavement management is also to be done.

Q. What are the indications of early interference?

Ans. a. Psychological upset of the woman (common)
 b. Failure of expulsion of the dead fetus by 7–10 days
 c. Evidence of uterine infection
 d. Falling fibrinogen level.

Q. What is the place of cesarean section in a case with IUFD?

Ans. Very rare.
 The indications are:
 Central placenta previa and previous cesarean scar (two or more).

Q. What is the evaluation protocol of the stillborn?

Ans. Infant examination: Malformations, maceration; **umbilical cord:** entanglement of cord, number of cord vessels, cord prolapse, true knot (Fig. 2.35); **placenta:** abnormalities and meconium staining.



Fig. 2.35: True knot in the umbilical cord

Q. What are the investigations protocol in a case with IUFD?

Ans. To find out the cause of fetal death, the following investigations are commonly done:

Hematological: Maternal blood for ABO, Rh, Kleihauer-Betke, VDRL, thyroid profile, blood sugar, HbA1C, anticardiolipin antibodies.

Autopsy and cytogenetic study of the stillborn.

Q. What bereavement care does the woman or the couple need?

Ans. The bereaved couple is provided with all the support and sympathy. They are allowed to see the baby, if desired. The couple should be seen in the postpartum clinic after 6 weeks with the investigation reports. They are also counseled for future pregnancy. Their questions are answered in simple terms.

CASE-15 POLYHYDRAMNIOS

Case Summary

Mrs AC, 27 years old, para-1, gravida-2, miscarriage-0, living-1 ($P_{1+0+0+1}$), admitted at 34 weeks of gestation with dyspnea, difficulty to walk and lie down due to huge enlargement of the abdomen. Clinical examination revealed: On inspection huge abdominal enlargement from symphysis pubis to xiphisternum. Maximum enlargement is observed at the level of the umbilicus. Symphysiofundal height measured was 41 cm and the abdominal girth measured at the level of umbilicus was 122 cm. Palpation of fetal parts was difficult. Fluid thrill could be elicited. Clinically amount of liquor appeared more than normal. FHS could not be heard.

Q. What is your provisional diagnosis?

Ans. Polyhydramnios/
hydramnios (Fig. 2.36).

Q. Mention the differential diagnosis of excessive uterine enlargement.

Ans. The different causes for disproportionate enlargement of the uterus are: (1) wrong date, (2) multiple pregnancy, (3) big baby, (4) pregnancy with pelvic tumors (fibroid or ovarian) and (5) maternal ascites.



Fig. 2.36: Hugely enlarged abdomen (excess measurement of the girth of the abdomen around the umbilicus) due to polyhydramnios

Q. How do you define polyhydramnios?

Ans. Clinically: Excessive volume of liquor causing discomfort to the patient and/or causing difficulties to the clinical diagnosis of the lie and presentation of the fetus.

Anatomically: When liquor amni is > 2000 ml.

Sonographically: When the amniotic fluid index (AFI) is > 24 cm (> 95th centile for gestational age) and a single deepest liquor pocket is > 8 cm.

Q. How can you confirm the diagnosis of polyhydramnios in your case?

Ans. Clinically it is suggested but ultrasonographic assessment would be the best way to confirm the diagnosis.

Q. What are the common causes of polyhydramnios?

Ans. (i) Fetal congenital malformations (20%) : anencephaly, open spina bifida, esophageal or duodenal atresia and fetal hydrops, (ii) multiple pregnancy, (iii) maternal diabetes, (iv) idiopathic and (v) chorioangioma of placenta.

Q. What are the different fetal congenital anomalies seen with polyhydramnios?

Ans. The major anomalies include : anencephaly, open spina bifida, esophageal or duodenal atresia, diaphragmatic hernia, fetal hydrops and cardiac anomalies. Karyotyping would be worthwhile in some selected cases.

Q. What are the different investigations that you plan to do in your case besides the routine ones?

Ans. Ultrasonography: Confirms the diagnosis. It has also got other benefits: (i) to exclude multiple pregnancy, (ii) to note the lie and presentation of the fetus, (iii) to diagnose fetal congenital malformations (mentioned above) and (iv) placental localization.

Blood: Maternal blood glucose, ABO, Rh group (rhesus alloimmunization).

Amniocentesis: Amniotic fluid for α -fetoprotein estimation. Fetuses with open neural tube defects have elevated AFP levels. Karyotyping would also be worthwhile.

Q. What are the common obstetric complications in a case with polyhydramnios?

Ans. Maternal: (i) Pre-eclampsia, (ii) malpresentation, (iii) premature rupture of membranes, (iv) preterm labor, (v) placental abruption, (vi) cord prolapse, (vii) uterine atony and (viii) postpartum hemorrhage.

Puerperium: (i) Subinvolution, and (ii) increased risk of infection and puerperal morbidity.

Fetal: Increased perinatal mortality (50%) due to congenital malformations and prematurity.

Q. What could be the underlying basic pathology of polyhydramnios?

Ans. Fetal urine and the amniotic epithelium secretion are the major sources of amniotic fluid and fetal swallowing is the major mode of absorption. Therefore either excessive production or deficient absorption is the basic underlying pathology. However in about 60% of cases the etiopathology is unknown.

Q. What is your plan of management in this case?

Ans. Usually, **cases with mild degree of polyhydramnios do not require any active intervention.** But cases with severe degree polyhydramnios, the woman needs to be admitted. My plan is to do the investigations as early as possible. Aim of investigations is to look for any cause of polyhydramnios like fetal congenital malformation, maternal diabetes, rhesus isoimmunization, etc. Subsequent management would be according to the pathology:

(a) **When fetal congenital malformation is present**—delivery is an option with counseling. In that case cervical ripening may be done by using PGE₂ gel intracervically.

- (b) **When fetal malformation is absent**—pregnancy may be continued till 37 weeks (as she is < 37 week of gestation now). Management will be done if any complicating factor (diabetes mellitus) is detected. As this woman is having cardiorespiratory embarrassment, amnioreduction (1–1.5 liters) may be done slowly under ultrasonographic guidance to relieve her symptoms. Once she reaches ≥ 37 weeks, delivery is to be planned.

Cervical ripening may be done using intracervical PGE₂ gel followed by controlled artificial rupture of membranes. Oxytocin infusion may be started if contractions are poor.

Q. What complication may arise in such a case during the third stage of labor and how do you prevent it?

Ans. Atonic postpartum hemorrhage is a significant complication. To prevent this complication active management of third stage of labor should be done. For this reason she should be delivered in an equipped center.

OLIGOHYDRAMNIOS

Q. What is oligohydramnios?

Ans. Clinically when the liquor volume is deficient (< 200 ml at term) and the AFI is < 5 (< 10th centile) or maximum vertical liquor pool is < 2 cm.

Q. What are the common causes of oligohydramnios?

Ans. Common causes:

A. Fetal: (i) Fetal chromosomal anomalies, (ii) fetal malformations (renal agenesis, obstruction of the urinary tract).

B. Maternal: Hypertension in pregnancy.

C. Others: (i) Placental insufficiency (IUGR), (ii) drugs (ACE inhibitor), (iii) postmaturity, and (iv) intrauterine infection.

D. Idiopathic

Q. Mention the fetal complications due to oligohydramnios.

Ans. (i) Increased risk of miscarriage or preterm delivery, (ii) fetal deformity (club foot, skull deformity), (iii) fetal pulmonary hypoplasia, (iv) cord compression, and (v) high perinatal mortality.

Q. How do you manage a case of oligohydramnios?

Ans. A. Presence of fetal congenital malformations

Couple counseling and delivery.

B. Isolated and late onset oligohydramnios may be managed conservatively with careful monitoring. Increase in oral fluids intake, amniofusion have been tried to improve the outcome. Delivery is done with completion of 37 weeks.

CASE-16 ANTEPARTUM HEMORRHAGE

Q. What are the causes of vaginal bleeding in later months of pregnancy?

Ans. (a) **Placental bleeding (70%):** Placenta previa (Fig. 2.37) and (ii) Abruptio placenta.

Extraplacental bleeding (5%): Cervical polyp, ectopy, cervical carcinoma and local trauma.

Unexplained (25%).

Q. Define antepartum hemorrhage.

Ans. It is the bleeding from or within the genital tract after 28th week of pregnancy but before the birth of the baby.

PLACENTA PREVIA

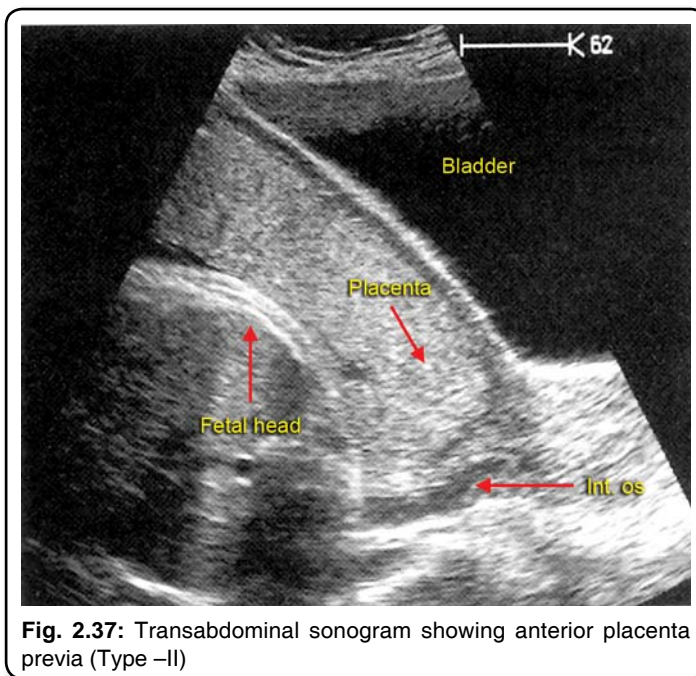


Fig. 2.37: Transabdominal sonogram showing anterior placenta previa (Type -II)

Case Summary

Mrs CR, 26 years old, was $P_{1+0+0+1}$ was admitted at 35 weeks of gestation with painless recurrent, fresh vaginal bleeding. Her general physical examination revealed: pulse—96/min, BP—110/70 mmHg, and mild pallor. Her cardiovascular and respiratory systems were normal. Obstetric examination revealed: Uterus 36 weeks, relaxed, SFH 36 cm, single fetus, cephalic presentation free, liquor adequate and FHS was 146 beats/minute and was regular. On vulval inspection, slight fresh bleeding per vaginam was still present.

Q. What is the clinical diagnosis?

Ans. Antepartum hemorrhage, most likely placenta previa.

Q. How do you define placenta previa?

Ans. When the placenta is implanted partially or completely over the lower uterine segment it is called placenta previa.

Q. What are the types of placenta previa?

- Ans.** 1. **Marginal:** Edge of the placenta near the internal os, but does not cover it
 2. **Partial:** Placenta covers the internal os partially
 3. **Complete:** Placenta covers the internal os completely.

Q. What is the cause of bleeding in placenta previa?

Ans. The inelastic placenta is separated from the wall of the lower uterine segment as it progressively enlarges in later months. This leads to opening up of the uteroplacental vessels and leads to bleeding.

Q. What are the complications of placenta previa?

Ans. Complications are both to the mother and the fetus.

| Maternal complications | Fetal complications |
|---|---------------------------------|
| ♦ Severe antepartum hemorrhage may lead to shock | ♦ Low birth weight babies |
| ♦ Preterm labor | ♦ Asphyxia |
| ♦ Hemorrhage during labor | ♦ IUFD |
| ♦ Increased cesarean delivery | ♦ Birth injuries |
| ♦ Increased risk of retained placenta → placenta accreta → requiring hysterectomy | ♦ Congenital malformations |
| ♦ Postpartum hemorrhage | ♦ Fetal anemia |
| ♦ Postpartum sepsis | ♦ Fetal exsanguination |
| ♦ Increased maternal mortality | ♦ Increased perinatal mortality |

Q. How does a woman with placenta previa present?

Ans. Painless, sudden onset, apparently causeless and recurrent vaginal bleeding is the hallmark of diagnosis of placenta previa. Bleeding is fresh and without any uterine contractions.

Q. How should a case of placenta previa be diagnosed?

Ans. Vaginal examination is contraindicated in a case with placenta previa. It may cause further bleeding. Ultrasonography is the mainstay of diagnosis. Transabdominal ultrasonography (TAS) is accurate in about 98% of cases (Fig. 2.37). Transvaginal sonography (TVS) is more accurate than TAS.

Q. How is case of placenta previa managed?

Ans. All cases with APH are to be admitted. Maternal and fetal conditions are evaluated. USG is done for placental localization and fetoplacental unit. Large bore IV cannula is sited. Blood is sent for complete hemogram, ABO, Rh grouping, coagulation profile and cross matching. Maternal hemodynamic stabilization is done with aggressive crystalloids and blood replacement when needed. A large bore IV cannula is sited. Actual management is:

(a) **Active interference:** This is done in cases when:

- Vaginal bleeding continues
 - Pregnancy ≥ 37 weeks
 - Patient in labor
 - Fetus is dead
 - Fetus is congenitally malformed
- Steriod (beta methasone therapy is given to accelerate pulmonary maturity when pregnancy is <37 weeks)

(b) **Expectant management:** Mcafee regimen—This is done in cases when:

- ♦ No active vaginal bleeding
- ♦ Pregnancy is < 37 weeks
- ♦ Patient is hemodynamically stable and with CTG-reactive fetus.

Aim is to continue pregnancy to 37 weeks or at least to 34 weeks.

Mode of delivery in either of the above two groups may be:

- a. Cesarean section when placenta is Type II (posterior), III or IV. **However, all cases of placenta previa, where placenta encroaches within 2 cm of the internal os, cesarean section is recommended (RCOG 2008).**
- b. **Vaginal delivery** in cases with minor degree placenta previa and with spontaneous onset of labor, may be allowed. Induction may be done with ARM \pm oxytocin (in cases with Type I or II ant. placenta excluding the group (a).

However, all cases considered for vaginal delivery need close monitoring. Such a case may need cesarean section if there is any obstetric indication (vaginal bleeding).

Woman should be given steroid therapy if pregnancy at the time of delivery is < 37 weeks.

Q. Is there any special arrangement for cesarean delivery in such a case?

Ans. Yes, cesarean delivery in this patient, needs a special arrangement to be organized beforehand. Operation should preferably be done by a senior obstetrician. Prior blood arrangement is essential. Type of uterine incision depends upon the type of placenta previa. Patient should be counseled as regard to the risk of morbid adherent placenta and the need of emergency hysterectomy.

Q. What is the relationship between previous cesarean section and incidence of placenta accreta?

Ans. The risk increases with number of prior cesarean delivery. Risk of placenta accreta is around 11% when the women has got one previous cesarean delivery. It rises to 61% when she has got prior three cesarean delivery.

Q. What is the risk of recurrence for placenta previa?

Ans. Overall incidence of placenta previa is 0.3%. Recurrence risk is about 2.4% (8-fold increase).



Fig. 2.38: Candidate auscultates FHS on the left spinoumbilical line using the funnel of the stethoscope

CASE-17 ABRUPTIO PLACENTA (Accidental Hemorrhage)

Case Summary

Mrs AR, 34 years old, ($P_{3+0+0+3}$) was admitted at 34 weeks of gestation with the complaints of abdominal pain and vaginal bleeding. She was hemodynamically stable. On general physical examination: pulse—100/minute and BP—140/90 mmHg, marked pallor and mild pedal edema. Her cardiovascular and respiratory systems were normal. Obstetric examination revealed: Uterus 36 weeks size, tense, tender and rigid. SFH 37 cm, single fetus, cephalic presentation, FHS could not be localized. On vulval inspection, slight vaginal bleeding was present. It looked dark in color.

Q. What is your clinical diagnosis?

Ans. Antepartum hemorrhage, most likely abruptio placentae.

Q. Why do you say so?

Ans. This multiparous woman presents with abdominal pain and vaginal bleeding. She is hypertensive. Her uterus is tense, tender and rigid. SFH is more than the period of amenorrhea. FHS could not be localized. The vaginal bleeding is dark in color. All these suggests the clinical diagnosis of abruptio placenta.

Q. What is placental abruption?

Ans. It is the premature separation of a normally implanted placenta before delivery of the fetus. It may be:

(i) **Revealed type:** When the bleeding comes out of the cervical canal and is visible externally (90%), (ii) **Concealed type:** When the hemorrhage is concealed (10%) and (iii) **Mixed type.**

Q. What are the complications of abruptio placentae?

Ans. Complications occur both in the mother and the fetus.

| Maternal | Fetal |
|--|--------------------------------|
| ♦ Hemorrhage (antepartum) | ♦ Prematurity |
| ♦ Disseminated intravascular coagulation (DIC) | ♦ Fetal death |
| ♦ Shock | ♦ Hypoxia |
| ♦ Oliguria and anuria—Renal failure | ♦ Fetal anemia |
| ♦ Hemorrhage (postpartum) | ♦ IUGR |
| ♦ Puerperal sepsis | ♦ Low birth weight |
| ♦ Increased maternal mortality | ♦ Increase perinatal mortality |

Q. What are the common causes of abruptio placentae?

Ans. (i) Hypertension in pregnancy, (ii) increasing parity, (iii) increasing maternal age, (iv) smoking, (v) short cord, (vi) folic acid deficiency, (vii) thrombophilias, and (viii) placental abnormalities (circumvallate placenta).

Q. How clinically is a case of placental abruption suspected?

Ans. Woman presents with vaginal bleeding in second or third trimester of pregnancy (90%). It is associated with abdominal pain, uterine tenderness and often with a dead fetus.

Q. Is ultrasound helpful to confirm the diagnosis?

Ans. Ultrasonography is useful to exclude the diagnosis of placenta previa. But it can neither confirm nor can exclude the diagnosis of abruptio placentae.

Q. How do you differentiate placental abruption from placenta previa?

Ans: **Placental abruption** is differentiated from **placenta previa** mainly with clinical presentation.

Diagnostic clinical features in a case with placental abruptions (Fig. 2.39) are:

- Vaginal bleeding is associated with **abdominal pain**. Whereas in a case with placenta previa the bleeding is **painless**.
- Often it is associated with **pre-eclampsia**.
- The blood is of **dark in color**. In a case with placenta previa the bleeding is fresh and red.
- The **height of the uterus is increased** (concealed variety).
- The uterus feels **tense, rigid and tender**. In placenta previa the uterus is soft and relaxed.
- Fetal heart sound **may be absent** (as there is fetal death in majority of the cases).
- Sonography—Placenta is in the upper segment whereas in a case with placenta previa, placenta is seen in the lower uterine segment.

Q. What is the source of bleeding in placental abruption?

Ans. It is mainly the maternal bleeding. But it may be either maternal or fetal in origin.

Q. How can a case of abruptio placentae be managed?

Ans. All cases of abruptio placentae are admitted. Maternal and fetal conditions are evaluated. A wide bore cannula is sited. Blood is sent for complete hemogram,



Fig. 2.39: Fetal death due to placental abruption. Retroplacental clots are seen

coagulation profile, ABO, Rh grouping and cross matching. Resuscitation is started with IV crystalloid solutions, and cross match blood transfusion and O₂ administration. An urinary catheter is placed and urine output is monitored hourly. Fetal evaluation is done with USG and CTG.

Actual Management

A. Concealed variety with increase in symphysiofundal height

• Delivery

- (i) Patient in labor → ARM ± oxytocin (it is commonly done)
- (ii) Patient not in labor and/or unfavorable cervix → cesarean delivery.

B. Revealed variety:

- (i) Patient is in labor → delivery
- (ii) Patient is not in labor:
 - (a) Pregnancy ≥ 34 weeks → delivery either by ARM ± oxytocin or by cesarean section;
 - (b) Pregnancy is < 34 weeks: Bleeding stops, fetus remote from term, mild abruption, CTG reactive fetus → may be considered for expectant management to get the benefit of steroid therapy. She is given steroid therapy if pregnancy is < 37 weeks.

Conservative management of placental abruption is an exception, not the rule. The patient is closely monitored while admitted, only to attain the fetal maturity or to buy time to get the benefit of steroid therapy.

Q. What is the risk of recurrence for placental abruption?

Ans. The overall risk of recurrence is 6–17% in subsequent pregnancy.

Q. What is a Couvelaire uterus?

Ans. It is a pathological condition of the uterus seen in a woman during laparotomy following massive placental abruption. There is widespread extravasation of blood into uterine musculature upto the serosa. The uterus appears bluish in color.

Q. Is Couvelaire uterus an indication of hysterectomy?

Ans: Generally the condition does not interfere with the uterine myometrial contractions. Usually this condition does not lead to postpartum hemorrhage. Couvelaire uterus is not an indication of hysterectomy.

OBSTETRIC COMPLICATIONS

CASE-18

POSTPARTUM HEMORRHAGE (PPH) – PREVENTION AND MANAGEMENT

Obstetric hemorrhage (mainly antepartum and/or postpartum) is a leading cause of maternal death in both developed and developing countries (see p. 248). Primary postpartum hemorrhage is most common.

Q. How do you define PPH?

Ans. Amount of blood loss 500 ml or more following birth of the baby is defined as PPH (WHO). The clinical definition states “any amount of bleeding from or within the genital tract following birth of the baby upto the end of puerperium which adversely affects the general condition of the mother as evidenced by rise in pulse rate or falling in blood pressure is called postpartum hemorrhage”.

Q. How do you define primary PPH?

Ans. Primary postpartum hemorrhage is defined as the hemorrhage that occurs within 24 hours following birth of the baby. It may be before (third stage hemorrhage) or after (true PPH) expulsion of the placenta.

Depending upon the amount of blood loss PPH can be: (A) Minor (<1L), (B) major (>1L) or (C) severe (>2L). Estimation of blood loss by inspection only is often under estimated. Accurate methods are blood collected in drapes and weighing the swabs.

Case Summary: Mrs Balamma, 30 years old ($P_{3-G4-A1-L3}$) had her vaginal delivery at home with the SBA. She started bleeding following delivery of the placenta. Placenta was found complete on examination. She was rushed to the hospital and was admitted as an emergency.

Q. What is this clinical condition called?

Ans. Primary postpartum hemorrhage (true).

Q. What are the important causes of PPH?

Ans. Causes can be divided under the heads of ‘four Ts’:

- Tone (atonic uterus)
- Trauma (genital tract)
- Tissue (retained products of conception)
- Thrombin (coagulopathy).

The most common cause of primary PPH is atonic uterus (80%).

Q. What is the major concern about PPH?

Ans. Obstetric hemorrhage is the major cause of maternal deaths in both developed and developing countries. PPH is the lead cause of maternal mortality in India. However, maternal mortality due to PPH is a preventable condition.

Q. What are the high-risk factors of PPH?**Ans.** High-risk factors of PPH are:

- a. Grand multipara
- b. Over enlargement of uterus—multiple pregnancy and hydramnios
- c. Anemia
- d. Antepartum hemorrhage
- e. Prolonged labor
- f. Morbidly-adherent placenta
- g. Genital tract trauma.

Q. What should you do immediately to manage a case of major primary PPH?

- Ans.**
- ❑ To alert obstetric and anesthetic seniors and the on-duty midwife (call for help).
 - ❑ To start IV infusion with crystalloids (Ringer's solution) putting two large bore (14-gauge) cannulas (upto 2 liters).
 - ❑ To send blood for ABO, Rh, grouping, cross matching and to ask for at least 2 units of blood.
 - ❑ To give O₂ by face mask at 10–15 liters/minute, keeping the patient flat.
 - ❑ To start 40 units of oxytocin in 1 liter of normal saline, IV, at the rate of 60 drops/minute.
 - ❑ Continuous catheterization (Foley catheter), to monitor hourly urine output.
 - ❑ To transfuse blood as soon as available.

Q. What is the other medical management available for atonic PPH?

- Ans.**
- To massage the uterus (fundus) to simulate uterine contractions
 - To start oxytocin infusion (discussed above)
 - Use of other oxytocics:
 - (a) Injection methergin 0.2 mg IV
 - (b) Injection carboprost (PGF_{2α}) 250 mcg IM, may be repeated at intervals (> 15 minutes), maximum 8 doses. Injection carboprost 250 mcg intramyometrial may be given.
 - (c) Misoprostol (PGE₁) 1000 mg can be given rectally.

Q. Besides atonic hemorrhage, what other conditions must be excluded?

- Ans.**
- ❑ Retained products of conception (placenta, clots and membranes).
 - ❑ Genital tract injury (cervix, vagina and perineum).
 - ❑ Broad ligament hematoma.
 - ❑ Ruptured uterus.
 - ❑ Coagulation failure (rare).

Q. What are the different surgical measures that can be taken to control the hemorrhage?

- Ans.**
- **Exploration** of the uterus under general anesthesia.
 - **To repair** any injury of the genital tract (cervix, vagina, perineum).

■ **Uterine tamponade:**

- Balloon tamponade is **ideal and is the first line surgical management for atonic PPH**. It is done by using different types of hydrostatic balloon catheter (Foley catheter, Bakri balloon (Fig. 2.40), Condom catheter, Sangstaken-Blakemore esophageal catheter). Balloon is inflated with 200–500 ml saline. This is effective and can avoid hysterectomy in 78% cases.

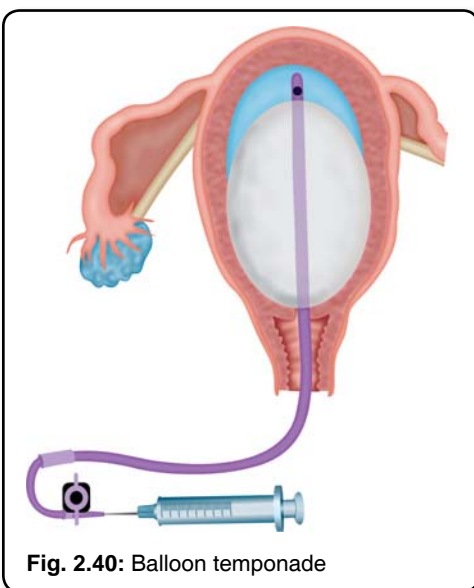


Fig. 2.40: Balloon tamponade

The balloon tamponade is kept 4–6 hours for hemostasis. Balloon is deflated before it is removed.

- Tight intrauterine packing.
 - Bimanual compression.
 - Compression of the aorta may be a temporary but effective measure to allow some time for resuscitation.
- **Hemostatic brace (compression) suture** (B-Lynch 1997 or its modifications—successful in 81% cases). Hemostatic suture techniques are effective in controlling severe PPH. This can reduce the need of hysterectomy.
- **Uterine devascularization procedures:**
- (a) Bilateral ligation of uterine or utero-ovarian vessels.
- **Internal iliac artery ligation** bilateral is an effective method to control PPH. However, balloon tamponade and hemostatic suturing methods are simpler and much easier to perform.
- **Selective arterial embolization or occlusion** has been found successful in 97% of cases of PPH. However, it needs the equipment and an interventional radiologist. Arterial embolization for control of PPH does not impair subsequent menstruation and fertility.
- **Hysterectomy** (sooner than later). A second consultant/senior obstetrician should be involved in decision-making.
- Once bleeding is controlled, patient is observed in an ICU or in high-dependency unit.

Q. Mention the different preventive measures for PPH?

Ans. Preventive measures may be there in the antenatal and in the intrapartum period.

However, most cases of PPH have no identifiable risk factors.

Antenatal preventive measures:

- Improvement of anemia
- Blood group and Rh typing for all women
- Localization of placenta by ultrasonography in women with prior cesarean delivery.

Intrapartum preventive measures:

- Active management of third stage of labor
- Prophylactic oxytocic for women with high risk factors for PPH (oxytocin 5 IU, IM) in the third stage of labor is the drug of choice.

Q. Considering the importance of PPH management, how should the labor ward staff be trained ?

Ans. Important issues are:

- A. **Regular drill of PPH management** should be organized to improve the skill and competence of labor ward staff.
- B. **Accurate documentation** of sequence of events is very important. Time of onset of events, time of start of treatment to record the category of staff involved, clinical condition of the patient, monitoring parameters, management issues are all documented. Careful documentation can avoid many litigation problems.

CASE-19 HEMORRHAGE IN EARLY PREGNANCY**Case Summary**

Mrs. AR, a 30-year-old lady, was admitted due to the problems of recurrent episodes of vaginal bleeding for last one week. Her last menstrual period was 8 weeks back. Urine pregnancy was positive when done two weeks ago. She perceived some amount of pain in the lower abdomen also.

Chapter Objectives

Candidate should have the knowledge and understanding of

- Normal early pregnancy management
- Early pregnancy problems and the basic management issues

Q. What is your provisional diagnosis?

Ans. She may be a case of threatened miscarriage.

Q. What are the common causes of hemorrhage in early pregnancy?

Ans. The causes are divided into two groups:

A. Related to pregnancy:

(i) Abortion (95%), (ii) ectopic pregnancy, (iii) hydatidiform mole, and sometimes (iv) implantation bleeding.

B. Other causes not related to pregnancy:

(i) Cervical pathology—cervical ectopy, polyp or malignancy.

Q. What are the different types of abortions?

Ans. Abortion may be: (1) spontaneous (miscarriage), or (2) induced.

Spontaneous abortion or miscarriage may be further classified into: (a) threatened, (b) inevitable, (c) complete, (d) incomplete, (e) missed and (f) septic.

Spontaneous abortion may again be: (1) isolated, or (2) recurrent.

B. Induced abortion may be (i) legal (MTP), and (ii) illegal, criminal or unsafe.

Q. What is a threatened miscarriage?

Ans. When the process of miscarriage has started but continuation of pregnancy is still possible.

Q. How clinically is a threatened miscarriage diagnosed?

Ans. Clinically the patient presents with (a) bleeding per vaginam, (b) pain in the lower abdomen, (c) on speculum examination, slight bleeding from the external os and (d) on pelvic examination, uterine size corresponds to the period of amenorrhea.

Q. How do you confirm the diagnosis?

Ans. Transvaginal sonography (TVS) reveals a well-defined gestational sac within the uterine cavity. Depending on the gestation age, gestational sac diameter, fetal node (CRL measurement), yolk sac, cardiac motion and fetal outline may be seen.

Q. What is a blighted ovum (silent miscarriage)?

Ans. It is a sonographic diagnosis of anembryonic pregnancy, (Dutta obs 8/e, p. 188 Fig. 16.1A)

Q. How is anembryonic pregnancy diagnosed?

Ans. Clinically, uterine size is less than the period of amenorrhea. There is lack of uterine growth. On ultrasound (TVS), there is absence of fetal pole within the gestational sac, even with a diameter of 3 cm or more. There is discrepancy between gestational sac development and the embryonic development.

Q. What is the management outline for a case with blighted ovum?

Ans. Suction evacuation or dilation and evacuation are done. Alternatively, medical methods can be used to terminate the pregnancy.

Q. What is an inevitable miscarriage?

Ans. It is a clinical type of miscarriage where the abortion process has progressed to a state wherefrom continuation of pregnancy is impossible. Sometimes products of conception may be seen to come out through the external os.

Q. How can you make the diagnosis clinically?

Ans. Clinically the patient presents with (a) increased vaginal bleeding, (b) increased lower abdominal pain, (c) on internal examination: internal os is dilated, through which the products of conception can be felt. Same observation is made while sonography is done. See p. 99).

Q. How do you manage a case of inevitable abortion?

Ans. Abortion process is to be expedited.

- a. Pregnancy is ≤ 12 weeks.

Suction evacuation or dilation and evacuation followed by curettage is done under general anesthesia.

- b. Pregnancy is >12 weeks: oxytocin drip IV is started. This is followed by evacuation of the uterus.

Q. What is a complete miscarriage?

Ans. When the products of conception are expelled completely, it is called complete miscarriage.

Q. What is a missed miscarriage?

Ans. When the fetus is dead and is retained inside the uterus for a variable period of time. It is also known as early fetal demise.

Q. What is a septic abortion?

Ans. Any abortion process when complicated with features of infection (sepsis) of its contents either local (uterus) or systemic is called septic abortion. Sepsis may be so severe as to cause death of the woman.

Q. What is a recurrent miscarriage?

Ans. Three or more consecutive miscarriages (spontaneous abortions) before 20 weeks of pregnancy, in a woman, are defined as recurrent miscarriage.

CASE-20**MISCARRIAGE (SPONTANEOUS ABORTION)****Case Summary**

Mrs. CK, a 27-year-old woman was seen for the problem of three previous miscarriages. All the miscarriages occurred between 14 and 20 weeks of gestation. She seeks advice as she is planning for the next pregnancy.

Q. What is her problem?

Ans. She is a case of recurrent miscarriage.

Q. How do you define recurrent miscarriage?

Ans. Three or more consecutive spontaneous abortions (miscarriages) before 20 weeks are defined as recurrent miscarriage.

Q. What are the common causes of recurrent miscarriage?

Ans. A. Genetic causes

- Trisomy (trisomy 21, 18, 13)
- Aneuploidy
- Polyploidy
- Translocations (balanced/reciprocal).

B. Endocrine causes

- Uncontrolled thyroid dysfunction (hypo/hyperthyroidism)
- Diabetes mellitus (uncontrolled)
- Luteal phase defect
- Polycystic ovarian syndrome.

C. Anatomical causes

- Uterine anomalies: Septate uterus, subseptate uterus
- Uterine synechiae
- Leiomyoma
- Cervical incompetence.

D. Infections

- Chlamydia, bacterial vaginosis, genital tuberculosis.

E. Immunological: Antiphospholipid syndrome, SLE.

F. Thrombophilias: (inherited or acquired).

G. Toxins: Smoking, alcohol, radiation.

H. Drugs: Misoprostol, quinine.

Q. What percentages of genetic abnormalities are responsible for miscarriages?

Ans. About 50–70% of all miscarriages are due to genetic abnormalities. In the first trimester, about 70% and about 30% in the second trimester, and only 3% of stillbirths are due to fetal chromosomal abnormalities.

Q. What is the most common type of chromosomal anomaly found in the aborted fetuses?

Ans. Autosomal trisomies are the most common of abnormalities found in the aborted fetuses. However, monosomy X or 45, XO is the singlemost common (10–20%) karyotype seen in aborted fetuses.

Q. What percentage of pregnancies does end in miscarriages?

Ans. About 15–20% of all clinically diagnosed pregnancies end in a miscarriage. But loss of subclinical pregnancy loss is about 40%. Combining together clinical and subclinical, about 50% of all pregnancies end in miscarriage.

Q. What is the place of anti-D immunoglobulin for patients with miscarriage?

Ans. All Rh-negative women with vaginal bleeding in early pregnancy (miscarriage or ectopic pregnancy) should receive anti-D immunoglobulin. When pregnancy is ≤ 12 weeks, 50 μgm IM is given and after 12 weeks, full dose—300 μgm IM is given.

Q. What are the different types of miscarriages? Outline the important diagnostic features and management issues for each of them.**Table 2.1: Types of miscarriages and the management issues**

| Type | Definition | Management option(s) |
|---------------------|---|--|
| Complete abortion | Spontaneous expulsion of all the products of conception from the uterus | No further management is required if certain on clinical examination or on ultrasonography (USG) that uterus is empty |
| Threatened abortion | Uterine bleeding is continuing (slight). There is no cervical dilation or effacement | USG to confirm fetal viability. Rest is advised till bleeding stops (as fetus is live). Progesterone therapy (vaginal/oral) may be given |
| Incomplete abortion | Partial expulsion of fetal or placental tissues (products of conception) | USG confirmation of products of conception left inside the uterus IV line is sited to start infusion of crystalloids/cross-matched blood depending upon the hemorrhage. Evacuation of the uterus as early as possible is done to remove the retained products of conception |
| Missed abortion | Fetus is dead and is retained inside the uterus for a variable period of time | Suction evacuation or dilatation and evacuation of the uterus. Cervix may need to soften with the use of PGE_1 (misoprostol) 4–6 hours prior to evacuation |
| Inevitable abortion | Process of abortion is associated with cervical dilatation and effacement. The products of conception can be seen (on speculum examination) | Resuscitation of the patient, as it is associated with bleeding. Evacuation of the uterus with surgical or medical (oxytocin infusion) methods |
| Septic abortion | Patient presents with features of sepsis: abnormal foul-smelling vaginal discharge, bleeding, rise in temperature and tachycardia | Control of sepsis with appropriate antibiotics (IV) following septic screen. USG to exclude foreign body. Evacuation of the uterus to eliminate the source of infection. May need laparotomy |

CHAPTER

3

Single Best Answers and Multiple Choice Questions

Chapter Objectives

- **Single Best Answers (SBAs)**
- **Multiple Choice Questions (MCQs)**

Total **329** SBAs and MCQs in Obstetrics are there for comprehensive revision of the subject with added explanations

- It is a good practice area to test an individual's level of knowledge
- To detect area weakness and to make it up

- **Single Best Answers (SBA)**
- **Multiple Choice Questions (MCQs)**

QUESTIONS

In this section, textbook page reference is given for explanation of the SBAs and the MCQs.

- Q. 01** *Amount of water retained during normal pregnancy at term is approximately:*
- a. 4.5 liters
 - b. 6.5 liters
 - c. 8.5 liters
 - d. 10 liters
- Q. 02** *The average blood loss during normal delivery is approximately:*
- a. >700 mL
 - b. <500 mL
 - c. >250 mL
 - d. <100 mL
- Q. 03** *The uterine musculature during pregnancy is arranged in the following layers:*
- a. Inner-longitudinal
 - b. Intermediate-interlacing
 - c. Outer-circular
 - d. Interlacing all the layers
- Q. 04** *The following are the changes in the uterus during pregnancy except:*
- a. Uterine cavity enlarges by 500–1000 times
 - b. The body of the uterus enlarges more than the fundus
 - c. Uteroplacental blood flow increases to about 500–600 mL/minute
 - d. During Braxton-Hicks contraction, there is stagnation of blood in the intervillous space
- Q. 05** *Principal blood values during pregnancy are all except:*
- a. Blood volume — rise by 40%
 - b. Plasma volume — rise by 50%
 - c. Red cell volume — rise by 20%
 - d. Hematocrit — rise by 10%
- Q. 06** *The following changes occur in blood coagulation factors in pregnancy except:*
- a. Fibrinogen level is very much elevated
 - b. Fibrinolytic activity is enhanced
 - c. Platelet count remains static or there is slight fall
 - d. Factor II is increased

ANSWERS

- Ans 1.** (b)
- Ans 2.** (b) Dutta Obs 8/e, p 474.
- Ans 3.** (b) The muscles are arranged as inner circular, outer longitudinal and intermediate interlacing one.
- Ans 4.** (b) The fundus increases relatively more than the body.
- Ans 5.** (d) There is slight fall in hematocrit.
- Ans 6.** (b) The fibrinolytic activity is depressed during pregnancy.

QUESTIONS

Q. 07 *The following are the hemodynamic changes at term in normal pregnancy except:*

- Cardiac output is increased by 30%
- Stroke volume is decreased in lateral position
- Pulse rate is increased
- Blood viscosity is decreased

Q. 08 *The following changes occur in the respiratory system at term in normal pregnancy except that:*

- Vital capacity remains unaffected
- Tidal volume is increased by 40%
- Residual volume is increased by 20%
- Respiratory rate remains unaffected

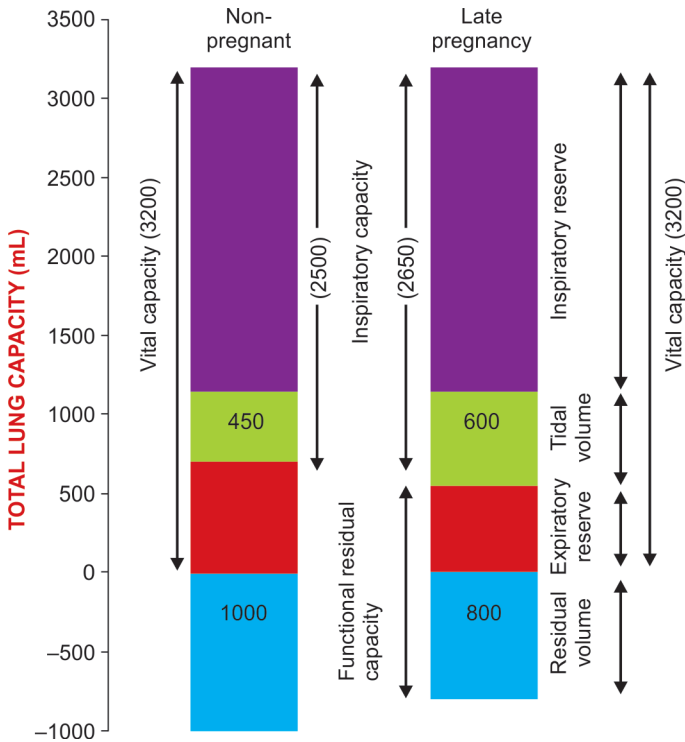


Fig. 3.1: Lung volumes in non-pregnant and pregnant women. TLC, total lung capacity (4200 is same for non-pregnant and pregnant conditions); VC, vital capacity; IC, inspiratory capacity; FRC, functional residual capacity; IRV, inspiratory reserve volume; TV, tidal volume; ERV, expiratory reserve volume, RV, residual volume. Values of TLC & VC remains unaltered in both the conditions.

ANSWERS

- Ans 7.** (b) Stroke volume is increased from 65 mL to 75 mL during pregnancy.
- Ans 8.** (c) Residual volume is decreased by 20% (Fig. 3.1).

QUESTIONS

Q. 09 *Number of antenatal visits in an uncomplicated pregnancy should be minimum:*

- a. 4 times
- b. 8 times
- c. 12 times
- d. 16 times

Q. 10 *Gestational age is evaluated from:*

- a. Calculation from LMP
- b. Height of the uterus
- c. Counting from the date of ovulation
- d. Counting from the date of fertilization

Q. 11 *Absolute (positive) signs of pregnancy are:*

- a. Abdominal enlargement
- b. Braxton-Hicks contraction
- c. Ballotment
- d. Audible FHS

Q. 12 *All are the positive signs of pregnancy except:*

- a. Amenorrhea
- b. Perception of active fetal movements
- c. Auscultation of FHS
- d. Sonographic evidences of fetus in uterus

Q. 13 *The following are features of Braxton-Hicks contraction except:*

- a. Regular
- b. Spasmodic
- c. Painless
- d. No adverse effect on the fetus

ANSWERS

Ans 9. (a) Timings are : 16, 24–28, 32 and 36 weeks (technical working group, WHO).

Ans 10. (a)

Ans 11. (d)

Ans 12. (a) Amenorrhea is a presumptive symptom of pregnancy.

Ans 13. (a) It is irregular and infrequent.

QUESTIONS

Q. 14 *The following is related to inlet diameters of the pelvis:*

- a. Shortest diameter of the inlet in A-P plane is true conjugate
- b. Diagonal conjugate measures 13 cm
- c. Sacrocotyloid diameter measures 9.5 cm
- d. Oblique diameter measures 11 cm

Q. 15 *The following is related to gravida and parity except:*

- a. A nulligravida is one who is not pregnant now but may have had a pregnancy before
- b. Gravida and para refer to pregnancies and not to babies
- c. A nullipara is one who has never completed a pregnancy to the stage viability
- d. Gravida denotes a pregnant state, both present and past, irrespective of period of gestation

Q. 16 *Recommended daily nutrients for women weighing 50 kg during second half of pregnancy are all except:*

- a. Total calories — 2500
- b. Folic acid — 400 µg
- c. Calcium — 500 mg
- d. Iron — 40 mg

Q. 17 *Important features of true labor pain are all except:*

- a. Lightening
- b. Show
- c. Dilatation and effacement of the cervix
- d. Bulging of the membrane during uterine contraction

ANSWERS

Ans 14. (c) The shortest diameter of the inlet is obstetric conjugate (10 cm); the diagonal conjugate measures 12 cm.

Ans 15. (a) A nulligravida is one who is not now and never has been pregnant.

Ans 16. (c) The approximate requirement of calcium is 1000 mg.

Ans 17. (a)

QUESTIONS

Q. 18 *The following are the events during labor except:*

- a. In primigravida, dilatation precedes effacement of the cervix
- b. In multipara, both occur simultaneously
- c. During contraction, the transverse diameter of the uterus is reduced but the longitudinal diameter increases
- d. Membranes usually rupture with full cervical dilatation

Q. 19 *Related to separation of placenta in the third stage of labor, the correct statement is:*

- a. Placenta separates through the compact layer of decidua
- b. Line of separation is through the basal layer of decidua
- c. Central separation is more common than the marginal one
- d. The principal mechanism for control of uterine bleeding is by thrombosis

Q. 20 *The first stage of labor is said to be completed:*

- a. When the membrane ruptures
- b. When the cervix fully dilates (10 cm)
- c. When active phase of labor begins
- d. With the appearance of bearing down efforts

Q. 21 *The following are the signs of placental separation except:*

- a. Fundal height is raised
- b. Uterus becomes globular and ballottable
- c. Flattening of the suprapubic region
- d. Permanent lengthening of the cord

Q. 22 *To be of value FHR is to be auscultated:*

- a. During uterine contraction
- b. Before and during uterine contraction
- c. Immediately following uterine contraction
- d. During uterine relaxation

ANSWERS

Ans 18. (a) In primigravida, effacement precedes dilatation of the cervix.

Ans 19. (b) Marginal separation is more common and the principal mechanism in hemostasis is uterine retraction.

Ans 20. (b)

Ans 21. (c) There is bulging of the suprapubic region following descent of the placenta in the lower segment.

Ans 22. (c)

QUESTIONS

Q. 23 *Following the delivery of a healthy baby, which one is the first to be done?*

- a. To place the baby on a tray with head slightly downwards
- b. To clear the air passage
- c. Apgar rating
- d. Clamping the umbilical cord

Q. 24 *The normal lochia discharge at the end of second week is called:*

- a. Lochia rubra
- b. Lochia serosa
- c. Lochia alba
- d. Lochia mixed

Q. 25 *First trimester MTP is best achieved by:*

- a. Suction evacuation
- b. Prostaglandins
- c. Oral mifepristone (RU 486) only
- d. Mifepristone and misoprostol (PGE_1)

Q. 26 *The following symptoms are related to ectopic pregnancy except:*

- a. Acute abdominal pain with history of amenorrhea
- b. Abdominal pain and bleeding per vaginam
- c. Fainting attack and shoulder tip pain
- d. Painless continued vaginal bleeding

Q. 27 *The diagnosis of ruptured tubal ectopic pregnancy is principally made by:*

- a. History and examination of the patient
- b. Sonography
- c. Laparoscopy
- d. Culdocentesis

ANSWERS

Ans 23. (b)

Ans 24. (c)

Ans 25. (d) Dutta Obs 8/e, p 203

Ans 26. (d) Varying degree of pain is the rule.

Ans 27. (a)

QUESTIONS

Q. 28 *The best method of management of molar pregnancy of uterine size 20 weeks in a woman aged 20:*

- a. Suction evacuation with or without oxytocin infusion
- b. Dilatation and evacuation
- c. Hysterotomy
- d. Episiotomy

Q. 29 *Type of eclampsia common in India is:*

- a. Antepartum
- b. Intrapartum
- c. Postpartum
- d. Mixed variety

Q. 30 *Tongue biting occurs in eclampsia in the state of:*

- a. Tonic
- b. Clonic
- c. Coma
- d. All of the above

Q. 31 *The following are related to the diagnosis of iron deficiency anemia except:*

- a. Low serum iron
- b. MCH is the most sensitive index
- c. MCV is less than $80 \mu\text{m}^3$
- d. Low serum ferritin

Q. 32 *Match the following:*

- | | |
|---------------------|--------------------------|
| a. Genital tubercle | 1. Labia minora |
| b. Urogenital sinus | 2. Clitoris |
| c. Müllerian ducts | 3. Lower third of vagina |
| d. Urethral folds | 4. Fallopian tubes |

ANSWERS

Ans 28. (a)

Ans 29. (a)

Ans 30. (b)

Ans 31. (b) MCHC is the most sensitive index to diagnose iron deficiency anemia and not MCH.

Ans 32. a = 2; b = 3; c = 4; d = 1.

QUESTIONS

Q. 33 *Best way to diagnose postmaturity is:*

- a. Straight X-ray abdomen
- b. Serial sonographic fetal biometry
- c. Amniocentesis
- d. Clinical examination

Q. 34 *Conclusive early evidence of intrauterine fetal death is:*

- a. Spalding sign
- b. Hyperflexion of the spine
- c. Appearance of gas shadow in the chambers of the heart and great vessel
- d. Doppler USG : absence of cardiac motion

Q. 35 *The commonest indication for termination of IUFD is:*

- a. Uterine infection
- b. Falling fibrinogen level
- c. Psychological upset of the mother
- d. Request by the husband

Q. 36 *The best way to terminate pregnancy with IUFD is:*

- a. Medical methods — Prostaglandins (E_2/E_1) and/or oxytocin
- b. Intra-amniotic instillation of hypertonic saline
- c. Transcervical extra-amniotic ethacridine lactate
- d. Early cesarean section

Q. 37 *To prevent active immunization of Rh-negative mother, Rh-anti-D immunoglobulin is administered intramuscularly to all mothers, except:*

- a. Within 72 hours following delivery, or after abortion or ectopic
- b. Following external cephalic version or amniocentesis
- c. Each time following subsequent delivery
- d. When the neonate is Rhesus-negative

ANSWERS

Ans 33. (b)

Ans 34. (d)

Ans 35. (c)

Ans 36. (a) Spontaneous expulsion in majority and instillation of hypertonic saline is risky.

Ans 37. (d) No antigenic stimulus, when the neonate is Rh-negative.

QUESTIONS

Q. 38 *The first stage of labor:*

- a. Begins when the membrane ruptures
- b. Normal duration is 20 hours
- c. Can be shortened by use of oxytocin
- d. Can be shortened by use of forceps

Q. 39 *Match the following:*

- | | |
|------------------------|---------------------------------|
| a. Naegele's pelvis | 1. Triradiate inlet |
| b. Rachitic pelvis | 2. Funnel-shaped pelvis |
| c. Osteomalacic pelvis | 3. Reniform inlet |
| d. Kyphotic pelvis | 4. Absent one ala of the sacrum |

Q. 40 *Known causes of breech presentation are all except:*

- a. Prematurity
- b. Hydrocephalus
- c. Placenta previa
- d. Primigravida

Q. 41 *The following statements are related to the mechanism of labor in breech except:*

- a. The engaging diameter of the buttocks is bitrochanteric—10 cm
- b. The engaging diameter of the shoulders is bisacromial—11 cm
- c. The engaging diameter of the head is suboccipitofrontal—10 cm
- d. The aftercoming head is born by flexion

Q. 42 *In transverse lie — match the following:*

- | | |
|---|------------------|
| a. Lie may change and the fetus becomes vertex: | 1. Evolution |
| b. Lie may change and the fetus becomes breech: | 2. Version |
| c. Delivery in doubled up fashion: | 3. Rectification |
| d. Delivery of breech followed by the head: | 4. Expulsion |

ANSWERS

Ans 38. (c)

Ans 39. a = 4; b = 3; c = 1; d = 2

Ans 40. (d)

Ans 41. (b) Bisacromial diameter measures 12 cm.

Ans 42. a = 3; b = 2; c = 4; d = 1.

QUESTIONS

Q. 43 *Macrosomia is occasionally related to all except:*

- a. Maternal obesity
- b. Gestational diabetes
- c. Prolonged pregnancy
- d. Maternal hypertension

Q. 44 *Early clamping of the umbilical cord is indicated in all except:*

- a. Rh-incompatibility
- b. Asphyxiated baby
- c. During CS when the baby is delivered by cutting through the placenta
- d. Postmature baby

Q. 45 *The commonest cause of retained placenta:*

- a. Uterine atonicity
- b. Hour-glass contraction
- c. Placenta accreta
- d. Placenta increta

Q. 46 *Malaria in pregnancy:*

- a. Causes fetal abnormalities
- b. Quinine is contraindicated
- c. Congenital malaria is frequent
- d. Pregnancy complications are more with *P. falciparum* infection

Q. 47 *Sloughing WF following obstructed labor can be tackled by all except:*

- a. To repair immediately
- b. Continuous catheter drainage for 10–14 days
- c. Repair after 3 months
- d. Control infection

ANSWERS

Ans 43. (d)

Ans 44. (d)

Ans 45. (a) Dutta Obs 8/e, p 484

Ans 46. (d) Congenital malaria is < 5%. (Dutta Obs 8/e, p 344)

Ans 47. (a) Repair should be withheld as the local tissue condition is not ideal due to infection and necrosis. (Dutta Obs 8/e, p 354).

QUESTIONS

Q. 48 *These are the common organisms in puerperal sepsis. Match them appropriately:*

- | | |
|----------------|-----------------------------------|
| a. Endogenous | 1. <i>Staphylococcus pyogenes</i> |
| b. Autogenous | 2. <i>E. coli</i> |
| c. Exogenous | 3. <i>Fragilis</i> |
| d. Bacteroides | 4. <i>Anerobic streptococcus</i> |

Q. 49 *Fetal blood is returned to the umbilical arteries and the placenta through the:*

- a. Hypogastric arteries
- b. Ductus venosus
- c. Ductus arteriosus
- d. Foramen ovale

Q. 50 *The principles to be followed in prescribing food for the newborn are all except:*

- a. The total fluid intake should be 150–170 mL/kg/day
- b. The diet should provide 110–125 kcal/kg/day
- c. LBW infants require less calorie
- d. VLBW newborns need fluid more than 200 mL/kg/day

Q. 51 *Composition of human milk (gm%) is as below except:*

- | | |
|----------------|-----------------|
| a. Sugar 7 | b. Fat 3.5 |
| c. Protein 3.4 | d. Minerals 0.4 |

Q. 52 *The intensive care protocols of the preterm neonates include all except:*

- a. To maintain the body temperature between 36.5–37.5°C
- b. Surfactant replacement therapy in some cases
- c. Early feeding between 1–2 hours of birth
- d. Less fluid replacement when phototherapy is used

ANSWERS

Ans 48. a = 4; b = 2; c = 1; d = 3.

Ans 49. (a) Dutta Obs 8/e, p 49

Ans 50. (c) LBW infants need more calories to sustain growth velocity.

Ans 51. (c) Protein content is 1.2 gm%. (Dutta Obs 8/e, p 524)

Ans 52. (d) It should be more.

QUESTIONS

Q. 53 *The neonatal complications of a growth-restricted fetus are all except:*

- a. Cerebral hemorrhage
- b. Hypoglycemia
- c. Meconium aspiration pneumonia
- d. DIC

Q. 54 *Babies with Apgar score 4–6 should be treated by all except:*

- a. The baby is put flat or at 15° head down position with the face turned to one side
- b. Tracheal intubation and IPPV immediately
- c. Immediate suction of the oropharynx and nasopharynx
- d. Administration of O₂ through bag and mask

Q. 55 *The causes of neonatal respiratory distress are all except:*

- a. Maternal diabetes
- b. Prematurity
- c. Cesarean birth
- d. Hyperbilirubinemia

Q. 56 *The causes of physiological jaundice in the newborn are all except:*

- a. Increased red cell destruction
- b. Defective conjugation due to decreased UDPGT activity
- c. Decreased RBC survival (90 days vs. 120 days)
- d. Enhanced conversion of bilirubin to urobilinoids by intestinal flora

Q. 57 *The following are related to cephalhematoma except:*

- a. It may occur even in normal labor
- b. It may be associated with fracture skull bone
- c. Active intervention is urgently needed
- d. It is limited by suture lines

ANSWERS

Ans 53. (a) Cerebral hemorrhage is common in preterm baby.

Ans 54. (b)

Ans 55. (d)

Ans 56. (d) It should be reduced conversion (UDPGT—Uridine diphosphate glucuronyl transferase).

Ans 57. (c)

QUESTIONS

Q. 58 *Fetal renal agenesis is commonly associated with all except:*

- a. Polyhydramnios
- b. Fetal growth restriction
- c. Pulmonary hypoplasia
- d. Fetal deformity

Q. 59 *Duodenal atresia is commonly associated with all except:*

- a. Hydramnios
- b. IUGR
- c. Trisomy 21
- d. Oligohydramnios

Q. 60 *The biological half-life of oxytocin is:*

- a. 1–2 minutes
- b. 3–4 minutes
- c. 5–6 minutes
- d. 7–8 minutes

Q. 61 *The following are related to ergot derivatives except:*

- a. It acts directly on the myometrium
- b. It initiates uterine contraction with increasing intensity
- c. It can effectively be used for induction of abortion
- d. It is highly effective in hemostasis following delivery

Q. 62 *Intravenous ergometrine with the delivery of anterior shoulder is contraindicated in all except:*

- a. Hydramnios
- b. Organic heart lesion
- c. Severe hypertension
- d. Rh-negative mother

ANSWERS

Ans 58. (a)

Ans 59. (d)

Ans 60. (b)

Ans 61. (c) It is absolutely ineffective in induction of abortion.

Ans 62. (a)

QUESTIONS

Q. 63 *Induction is less likely to be successful in all except:*

- a. Delivery before term
- b. Elderly primigravida
- c. Cases with prolonged retention of dead fetus
- d. Bishop's score > 6

Q. 64 *Management indications of low rupture of membranes are all except:*

- a. Type-1 placenta previa
- b. Floating head in labor
- c. Abruptio placentae
- d. Severe pre-eclampsia

Q. 65 *Pearl index is related with:*

- a. Degree of contracted pelvis
- b. Cervical scoring prior to induction
- c. Assessment of high-risk pregnancy
- d. Contraceptive effectiveness

Q. 66 *Pregnancy failure rate per HWY in male condom when used correctly and consistently:*

- a. 3
- b. 10
- c. 14
- d. 20

Q. 67 *Pregnancy failure rate per HWY in IUCD (CuT):*

- a. 1.5
- b. 2
- c. 4.5
- d. 6

ANSWERS

Ans 63. (d)

Ans 64. (b) Chance of cord prolapse is always there.

Ans 65. (d)

Ans 66. (a)

Ans 67. (b) 3rd generation IUDs (CuT 380A) have got lesser failure rate (0.6) than CuT.

QUESTIONS

Q. 68 *Pregnancy failure rate per HWY in 'Pill' (combined preparation) to verify:*

- a. 0
- b. 0.05
- c. 0.1
- d. 1
- e. None of the above

Q. 69 *Natural contraceptions are all except:*

- a. Coitus interruptus
- b. Rhythm method
- c. Prolonged lactation
- d. Sponge today

Q. 70 *The condom is suitable in all cases except:*

- a. Known cases of sexually transmitted disease
- b. Missing 'oral pills' in consecutive two days in a cycle
- c. Coital act is infrequent
- d. Following tubectomy operation

Q. 71 *The neonatal complications of premature babies are all except:*

- a. Hypothermia
- b. Infection
- c. Meconium aspiration pneumonia
- d. Anemia

Q. 72 *The failure rate of Pomeroy's technique is:*

- a. 0.01%
- b. 0.1%
- c. 0.5%
- d. 1%

ANSWERS

Ans 68. (c)

Ans 69. (d)

Ans 70. (d) It should be following vasectomy operation.

Ans 71. (c)

Ans 72. (b)

QUESTIONS

Q. 73 *In suction evacuation for MTP, the pressure of the suction is raised to:*

- a. 100–200 mmHg
- b. 200–300 mmHg
- c. 400–600 mmHg
- d. 700–900 mmHg

Q. 74 *The following statements related to episiotomy are all correct except:*

- a. It is a routine procedure in all cases
- b. It is a deliberate incision made on the perineum during the second stage
- c. It is infact an inflicted second degree perineal injury
- d. It is the most common obstetric operation

Q. 75 *The following are the direct obstetric cause of maternal death except:*

- a. Abortion
- b. Hemorrhage
- c. Anemia
- d. Eclampsia

Q. 76 *The following drugs cross the placental barrier to the fetus except:*

- a. Warfarin
- b. Heparin
- c. Digoxin
- d. Aspirin

Q. 77 *IV ergometrine during third stage of labor should not be given in these cases except:*

- a. Cardiac disease
- b. Pre-eclampsia
- c. Rhesus-negative
- d. Fibroid uterus

ANSWERS

Ans 73. (c)

Ans 74. (a) It should be made selectively.

Ans 75. (c) Anemia is an indirect cause of death.

Ans 76. (b)

Ans 77. (d)

QUESTIONS

Q. 78 *The process by which a viable product of conception is expelled by the mother is called:*

- a. Parturition
- b. Childbirth
- c. Labor and delivery
- d. All of the above

Q. 79 *The following are related to moulding of the head except:*

- a. During normal delivery, molding is inevitable
- b. In labor, parietal bones overlap the adjacent bones
- c. In grade-I, the bones touch but do not overlap
- d. Molding takes few days to disappear

Q. 80 *The official time of birth in normal delivery is the moment when:*

- a. Head is out
- b. Whole of the baby is out of the mother's body
- c. As soon as umbilical cord is cut
- d. As soon as baby cries

Q. 81 *The engaging diameter of the aftercoming head in breech is:*

- a. Suboccipitobregmatic
- b. Suboccipitofrontal
- c. Occipitofrontal
- d. Submentovertical

Q. 82 *The following are the physiological changes during late pregnancy except:*

- a. Blood volume is increased
- b. Cardiac output is increased
- c. Arterial PO_2 is decreased
- d. Tidal volume is increased

ANSWERS

Ans 78. (d) Dutta Obs 8/e, p 134

Ans 79. (d) It takes few hours to disappear.

Ans 80. (b)

Ans 81. (b)

Ans 82. (c) Arterial PO_2 is increased.

QUESTIONS

Q. 83 *As regards supine hypotension syndrome, true statement is:*

- a. Observed in about 1% of cases
- b. Commonly seen in early pregnancy
- c. Measurement of brachial artery pressure reflects the pressure in the uterine artery
- d. It is relieved by turning the woman on her side

Q. 84 *As regards breastfeeding, true statement is:*

- a. Hind milk gives more energy to the infant
- b. Baby should be changed to each breast at every 2–3 minutes
- c. Early and exclusive breastfeeding for 3–4 months
- d. Good attachment means baby should always be with the mother

Q. 85 *In relation to breastfeeding, match the following:*

- | | |
|------------------------------|------------------|
| a. Baby after vaginal birth | 1. 5–10 minutes |
| b. Baby after cesarean birth | 2. 2–3 hours |
| c. Duration of feed | 3. 4–6 hours |
| d. Frequency of feed | 4. 1/2 to 1 hour |

Q. 86 *As regards the induction of labor — true statement is:*

- a. Induction and augmentation are synonymous
- b. Preinduction Bishop's scoring can predict the success of induction
- c. In Bishop's cervical scoring system, total score is 10
- d. There is no extra benefit of combining medical and surgical methods

Q. 87 *2011 Census of India has the following data except:*

- a. Total population of 1210 million
- b. Birth rate—21.8/1000
- c. Couple protection rate 38%
- d. Literacy rate 74.04%

ANSWERS

Ans 83. (d) Observed in 10% of cases in late pregnancy. Uterine artery pressure is lower than that of brachial artery.

Ans 84. (a) Q. (c): It should be 4–6 months.

Ans 85. a = 4; b = 3; c = 1; d = 2.

Ans 86. (b) Q. (a): Augmentation accelerates already initiated labor. Q. (c): Total score 13. Q. (d): Combined method increases efficiency by reducing induction-delivery interval.

Ans 87. (c) Couple protection rate is 44%.

QUESTIONS

Q. 88 *Regarding placenta previa:*

- a. Visualization of internal cervical os is more accurate with transabdominal than with transvaginal sonography
- b. In vasa previa, the fetal vessels course over the cervical os
- c. Cocaine abuse is associated with increased placenta previa
- d. Placenta previa may be associated with placenta accreta

Q. 89 *Amniocentesis for assessment of fetal well-being should be performed at:*

- a. 10–12 weeks
- b. 13–14 weeks
- c. 16–18 weeks
- d. 20–22 weeks

Q. 90 *Pick up the correct statement:*

- a. Umbilical arteries carry pure blood from placenta to fetus
- b. Umbilical vein carries impure blood from the fetus to placenta
- c. Umbilical arteries carry pure blood from fetus to placenta
- d. Umbilical vein carries pure blood from the placenta to fetus

Q. 91 *Match the onset of action for the following oxytocics:*

- | | |
|--------------------|----------------|
| a. IV Methergin | 1. 1/2 minute |
| b. IV Oxytocin | 2. 1 minute |
| c. IV Ergometrine | 3. 1.5 minutes |
| d. IM Syntometrine | 4. 2.5 minutes |

Q. 92 *Drugs contraindicated in breastfeeding:*

- a. Warfarin
- b. Metronidazole
- c. Carbamazepine
- d. None of the above

ANSWERS

Ans 88. b, d, Q. (a) TVS is more accurate. Q. (c) associated with placental abruption.
a = False; b = True; c = False; d = True

Ans 89. (c)

Ans 90. (d)

Ans 91. a = 3; b = 1; c = 2; d = 4.

Ans 92. (d)

QUESTIONS

Q. 93 *Maturation Index at different phases of life – match the following:*

- | | |
|-----------------------|-----------------------|
| a. Midmenstrual phase | 1. 0/100/0 or 100/0/0 |
| b. Pregnancy | 2. 100/0/0 |
| c. Postpartum | 3. 0/95/5 |
| d. Menopause | 4. 0/40/60 |

Q. 94 *A fully mature ovum measures about:*

- a. 100 microns
- b. 130 microns
- c. 170 microns
- d. 180 microns

Q. 95 *Time required for a spermatogonium to develop into mature spermatozoon:*

- a. 30 days
- b. 60 days
- c. 90 days
- d. 120 days

Q. 96 *Capacitation involves all except:*

- a. Through this process the ejaculated spermatozoa undergo acrosome reaction
- b. Capacitation makes spermatozoa competent to bind the zona pellucida
- c. Capacitation occurs within the vaginal fluid
- d. It helps sperm transport to the fallopian tube from the vagina within two minutes (hypermotility)

Q. 97 *Morula (12–16 cell stage) enters the uterine cavity on:*

- a. 2nd day
- b. 3rd day
- c. 4th day
- d. 6th day

ANSWERS

Ans 93. a = 4; b = 3; c = 2; d = 1.

Ans 94. (b) Ovum measures about 130 microns.

Ans 95. (c) Dutta Obs 8/e, p 21

Ans 96. (c) It occurs within the cervical mucus. (d) Tyrosine phosphorylation and calcium ion influx are the two important biochemical changes.

Ans 97. (c)

QUESTIONS

Q. 98 *Implantation occurs following fertilization on:*

- a. 5th day
- b. 6th day
- c. 7th day
- d. 8th day
- e. 5th week

Q. 99 *Volume of blood in a mature placenta approximates:*

- a. 300 mL
- b. 500 mL
- c. 700 mL
- d. 1000 mL

Q. 100 *The amniotic fluid is completely changed and replaced in every:*

- a. 2 hours
- b. 3 hours
- c. 4 hours
- d. 5 hours

Q. 101 *Amniotic fluid volume at 40th week measures about:*

- a. 300–500 mL
- b. 600–800 mL
- c. 900–1200 mL
- d. 1300–1400 mL

Q. 102 *Regarding time division, all the statements are correct except:*

- a. Ovular period lasts for 2 weeks following ovulation
- b. Embryonic period begins at 3rd week following ovulation
- c. Fetal period begins at 8th week
- d. Fetal embryonic age is commonly used

ANSWERS

Ans 98. (b)

Ans 99. (b)

Ans 100. (b)

Ans 101. (b)

Ans 102. (d) Menstrual age is commonly used.

QUESTIONS

Q. 103 *After ovulation, primitive fetal circulation is established by the following days:*

- | | |
|-------|-------|
| a. 7 | b. 14 |
| c. 21 | d. 28 |

Q. 104 *The following changes occur in the vascular system of the newborn after birth:*

- a. Distal parts of the obliterated umbilical arteries form superior vesical arteries
- b. Umbilical vein becomes ligamentum venosum
- c. Ductus venosus becomes ligamentum teres
- d. Functional closure of the ductus arteriosus occurs soon after birth

Q. 105 *Cervical changes in pregnancy are the following except:*

- a. Bluish coloration of the cervix
- b. Softening of the cervix
- c. Inward extension of the squamous cells within the canal
- d. The secretion becomes copious and mucoid

Q. 106 *The optimum interval between uterine incision and delivery during cesarean section should be:*

- | | |
|--------------------------------|--------------------------------|
| a. Less than 90 seconds | b. Between 90 and 180 seconds |
| c. Between 180 and 210 seconds | d. Between 210 and 240 seconds |

Q. 107 *In embryonic development, primitive chorionic villi is formed in the stage of:*

- | | |
|---------------|-----------|
| a. Zygote | b. Morula |
| c. Blastocyst | d. Embryo |

ANSWERS

Ans 103. (c) Dutta Obs 8/e, p 32

Ans 104. (d) The distal parts of obliterated umbilical arteries become lateral umbilical ligaments. Umbilical vein becomes ligamentum teres. Ductus venosus becomes ligamentum venosum. (Dutta Obs 8/e, p 50)

Ans 105. (c) Downward extension of the columnar epithelium of the endocervix occurs beyond the squamocolumnar junction.

Ans 106. (a) Incision and manipulation of the uterus cause reflex uterine vasoconstriction resulting in fetal asphyxia. Interval > 90 seconds are associated with significant lowering of Apgar scores.

Ans 107. (c)

QUESTIONS

Q. 108 *Fetal hematopoiesis first occurs in:*

- a. Yolk sac
- b. Fetal spleen
- c. Fetal liver
- d. Fetal bone marrow

Q. 109 *The decidua is a source of:*

- a. Human placental lactogen
- b. Prolactin
- c. Chorionic gonadotrophin
- d. Thyrotrophin

Q. 110 *Peak level of serum Beta-HCG in normal pregnancy is found between:*

- a. 6 and 7 weeks
- b. 8 and 10 weeks
- c. 12 and 16 weeks
- d. 37 and 40 weeks

Q. 111 *Ultrasonic recognition of gestation is possible as early as (post-conceptional):*

- a. 2nd to 3rd week
- b. 4th to 5th week
- c. 6th to 7th week
- d. 8th to 10th week

Q. 112 *The most common symptom in acute disturbed tubal pregnancy is:*

- a. Vomiting
- b. Abdominal-pelvic pain
- c. Vaginal bleeding
- d. Fainting attack

ANSWERS

Ans 108. (a)

Ans 109. (b)

Ans 110. (b)

Ans 111. (b)

Ans 112. (b)

QUESTIONS

Q. 113 *Preventive vaccination in pregnancy is contraindicated in the following except:*

- a. Chickenpox
- b. Mumps
- c. Influenza
- d. Measles

Q. 114 *In android type of pelvis, the sacrosciatic notch is:*

- a. Narrow and shallow
- b. Narrow and deep
- c. Wide and deep
- d. Very wide and shallow

Q. 115 *In markedly deflexed vertex, the engaging diameter of fetal head is:*

- a. Suboccipitobregmatic
- b. Suboccipitofrontal
- c. Occipitofrontal
- d. Mentovertical

Q. 116 *The most common complication of eclampsia is:*

- a. Renal failure
- b. Pulmonary edema
- c. Cerebral hemorrhage
- d. Psychosis

Q. 117 *The most common fetal hazard in diabetes mellitus is:*

- a. Macrosomia
- b. Congenital malformations
- c. Intrauterine fetal death
- d. Birth injuries

ANSWERS

Ans 113. (c) Dutta Obs 8/e, p 349

Ans 114. (b)

Ans 115. (c)

Ans 116. (b)

Ans 117. (a)

QUESTIONS

Q. 118 *In asymmetrical IUGR, there is usually:*

- a. Disproportionate increase in relative brain size
- b. Disproportionate increase in relative liver size
- c. Disproportionate decrease in relative brain size
- d. No variation in liver and brain size

Q. 119 *Source of hemorrhage in placenta praevia is:*

- a. Torn fetal blood vessels
- b. Torn maternal blood vessels
- c. Torn both maternal and fetal blood vessels
- d. Tear of lower uterine segment

Q. 120 *In vertex LOT position, caput succedaneum is found over:*

- a. Left parietal bone
- b. Right parietal bone
- c. Occipital bone
- d. Frontal bone

Q. 121 *Commonest cause of retained placenta is:*

- a. Nonseparated placenta in atonic uterus
- b. Separated placenta in atonic uterus
- c. Constriction ring
- d. Placenta accreta

Q. 122 *Commonest cause of puerperal pyrexia is:*

- a. Genital infection
- b. Urinary infection
- c. Mastitis
- d. Thrombophlebitis

ANSWERS

Ans 118. (a)

Ans 119. (b)

Ans 120. (b)

Ans 121. (b)

Ans 122. (a)

QUESTIONS

Q. 123 *Optimum negative pressure to form a stable chignon in ventouse delivery is:*

- a. 0.2 kg/sq cm
- b. 0.4 kg/sq cm
- c. 0.6 kg/sq cm
- d. 0.8 kg/sq cm

Q. 124 *Antimalarial drug of choice during pregnancy is:*

- a. Chloroquine
- b. Quinine
- c. Pyrimethamine
- d. Spiramycin

Q. 125 *Perinatal transmission of virus in an HIV-positive woman is mostly:*

- a. Transplacental
- b. Contamination during vaginal delivery
- c. Breastmilk
- d. Body-contact after birth

Q. 126 *Leading causes of maternal mortality in our country are the following except:*

- a. Sepsis
- b. Hemorrhage
- c. Pre-eclampsia and eclampsia
- d. Thromboembolism

Q. 127 *Embryonic period commences at:*

- a. Fertilization
- b. Third week after fertilization
- c. Sixth week after fertilization
- d. Eighth week after fertilization

ANSWERS

Ans 123. (d) Dutta Obs 8/e, p 662

Ans 124. (a) Dutta Obs 8/e, p 345

Ans 125. (b) Dutta Obs 8/e, p 351

Ans 126. (d)

Ans 127. (b) Dutta Obs 8/e, p 46

QUESTIONS

Q. 128 *Liquor amnii volume is maximum at:*

- a. 12 weeks
- b. 24 weeks
- c. 30 weeks
- d. 40 weeks

Q. 129 *Real-time sonography can demonstrate fetal cardiac activity as early as (postconception):*

- a. 4th week
- b. 6th week
- c. 8th week
- d. 10th week

Q. 130 *The primary fetal response to infection is:*

- a. IgG production
- b. IgM production
- c. IgA production
- d. No immunologic response by fetus

Q. 131 *Most common of the following fetal malformations is:*

- a. Cardiac defect
- b. Spina bifida
- c. Cleft palate
- d. Renal defect

Q. 132 *Intrauterine pressure is highest in:*

- a. First stage of labor
- b. Second stage of labor
- c. Third stage of labor
- d. Fourth stage of labor

ANSWERS

Ans 128. (c) Dutta Obs 8/e, p 43

Ans 129. (b)

Ans 130. (a)

Ans 131. (b)

Ans 132. (b)

QUESTIONS

Q. 133 *The commonest complication of hydatidiform mole is:*

- a. Hemorrhage
- b. Pulmonary embolism
- c. Hyperemesis
- d. Choriocarcinoma

Q. 134 *Onset of eclampsia is most common in:*

- a. Early antenatal period
- b. Late antenatal period
- c. Intrapartum period
- d. Postpartum period

Q.135 *Microscopic examination of vaginal blood in a case of antepartum hemorrhage reveals nucleated RBC. Source of blood is:*

- a. Abruptio placenta
- b. Placenta previa
- c. Circumvallate placenta
- d. Vasa previa

Q. 136 *Submentobregmatic diameter of a mature fetus averages:*

- a. 8.5 cm
- b. 9.5 cm
- c. 10.5 cm
- d. 11.5 cm

Q. 137 *In platypelloid pelvis, head engages in:*

- a. Transverse diameter
- b. Oblique diameter
- c. Obstetric conjugate
- d. Sacrocotyloid diameter

ANSWERS

Ans 133. (a)

Ans 134. (b)

Ans 135. (d)

Ans 136. (b)

Ans 137. (a)

QUESTIONS

Q. 138 *The most common of the following causes of prolonged second stage of labor is:*

- a. Deep transverse arrest of vertex
- b. Pelvic outlet contraction
- c. Uterine inertia
- d. Constriction ring

Q. 139 *Placental separation and descent in third stage of labor is due to:*

- a. Contraction of uterus
- b. Retraction of uterus
- c. Controlled cord traction
- d. Contraction superadded on maximum retraction

Q. 140 *Muscles cut in mediolateral episiotomy are:*

- a. Levator ani only
- b. Levator ani and transverse perineal muscles
- c. Levator ani, transverse perineal muscles and bulbospongiosus
- d. Levator ani and sphincter ani externus

Q. 141 *Common indications of primary cesarean section in our country are the following except:*

- a. Cephalopelvic disproportion
- b. Fetal distress in first stage of labor
- c. Eclampsia, pre-eclampsia
- d. Previous cesarean delivery

Q. 142 *The most common cause of postpartum hemorrhage is:*

- a. Uterine atony
- b. Retained placenta
- c. Coagulation defects
- d. Injury to genital tract

ANSWERS

Ans 138. (c)

Ans 139. (d)

Ans 140. (c)

Ans 141. (d)

Ans 142. (a)

QUESTIONS

Q. 143 *Method of pelvic assessment in a gravid woman is generally:*

- a. Clinical
- b. Radiological
- c. Ultrasonic
- d. CT scanning

Q. 144 *Preferred drugs to treat urinary tract infection during pregnancy are the following except:*

- a. Ampicillin
- b. Amoxicillin
- c. Cephalosporins
- d. Chloramphenicol

Q. 145 *Anticoagulant which does not cross placental barrier:*

- a. Warfarin
- b. Heparin
- c. Both of the above
- d. None of the above

Q. 146 *Some of the leading causes of stillbirth in our country are the following except:*

- a. Antepartum hemorrhage
- b. Pregnancy-induced hypertension
- c. Prolonged and obstructed labor
- d. Severe anemia

Q.147 *Which layer of the musculature of pregnant uterus forms figure of 8 and acts as living ligature during the 3rd stage of labor.*

- a. External
- b. Internal
- c. Middle
- d. Neither of these

ANSWERS

Ans 143. (a)

Ans 144. (d)

Ans 145. (b)

Ans 146. (d)

Ans 147. (c) Dutta Obs 8/e, p 114

QUESTIONS

Q. 148 *External os is most patulous in:*

- a. Nulliparous
- b. Primigravidae
- c. Multiparous
- d. Para 2

Q. 149 *Peak-level of hCG in normal pregnancy occurs at:*

- a. 30–40 days
- b. 10–20 days
- c. 60–70 days
- d. 100–110 days

Q. 150 *Corpus luteum is developed to its fullest:*

- a. 4–6 days before menstrual bleeding
- b. 1–2 days before menstrual bleeding
- c. On the days of menstrual bleeding
- d. At the time of ovulation

Q. 151 *Steroid hormones of placenta are produced by:*

- a. Hofbauer's cells
- b. Syncytial trophoblast
- c. Cytotrophoblast
- d. All of the above

Q. 152 *During the first few months of pregnancy, hypertrophy of the uterus is stimulated by one of the following:*

- a. Estrogen and progesterone
- b. Direct effect of the expanding product of conception
- c. Estrogen alone
- d. Progesterone alone

ANSWERS

Ans 148. (c)

Ans 149. (c)

Ans 150. (a)

Ans 151. (b)

Ans 152. (a)

QUESTIONS

Q. 153 *The most diagnostic parameter of pregnancy is:*

- a. Amenorrhea
- b. Quickening
- c. Auscultation of FHS
- d. Distension of abdomen

Q. 154 *Implantation bleeding is called:*

- a. Hartman's sign
- b. Hoffman's sign
- c. Arias Stella sign
- d. Reinz's sign

Q. 155 *Contraction stress test is used to detect:*

- a. Hydramnios
- b. Placental insufficiency
- c. Placenta previa
- d. Head compression

Q. 156 *Normal FHR at 37–40 weeks:*

- a. 80–120/minute
- b. 100–160/minute
- c. 140–180/minute
- d. 160–200/minute

Q. 157 *Vomiting is a common feature of the following except:*

- a. Missed miscarriage
- b. Hydatidiform mole
- c. Multiple pregnancy
- d. First pregnancy

ANSWERS

Ans 153. (c)

Ans 154. (a)

Ans 155. (b)

Ans 156. (b)

Ans 157. (a)

QUESTIONS

Q. 158 *Amniocentesis is the best diagnostic if done:*

- a. 8–10 weeks
- b. 12–14 weeks
- c. 16–18 weeks
- d. 20–22 weeks

Q. 159 *Study of fetal parts in 1st trimester is best done with least radiation hazard:*

- a. X-ray abdomen
- b. Pelvimetry
- c. CT scan
- d. Ultrasound

Q. 160 *Pelvis should be assessed in a primigravida at:*

- a. 32 weeks
- b. 35 weeks
- c. 37 weeks
- d. Onset of labor

Q. 161 *Lochial discharge occurs for:*

- a. 1–4 days
- b. 5–10 days
- c. 10–14 days
- d. 14–21 days

Q. 162 *Puerperal pyrexia is the fever lasting for 24 hours or more after child birth if temperature is more than:*

- a. 99°F
- b. 99.5°F
- c. 100°F
- d. 100.4°F

ANSWERS

Ans 158. (c)

Ans 159. (d)

Ans 160. (d)

Ans 161. (d)

Ans 162. (d)

QUESTIONS

Q. 163 *Which one of the following pairs is not correctly matched?*

- a. Anemia in pregnancy — preterm labor
- b. Diabetes in pregnancy — fetal macrosomia
- c. Rheumatic heart disease — unexplained stillbirth
- d. Hypertension in pregnancy — IUGR

Q. 164 *The lower limit of hemoglobin below which a pregnant lady is called anemic is:*

- a. 8 gm%
- b. 9 gm%
- c. 11 gm%
- d. 12 gm%

Q.165 *Which one is known as dangerous placenta previa of Stallworthy:*

- a. Type I anterior
- b. Type II posterior
- c. Type I posterior
- d. Central placenta previa

Q. 166 *Which of the following statements is false in connection with Caput succedaneum:*

- a. It is due to venolymphatic stasis of scalp
- b. It is not limited to suture lines
- c. It occurs beneath the girdle of contact
- d. It disappears over a week

Q. 167 *Puerperal sepsis will have the following features except:*

- a. Offensive lochial discharge
- b. Fever
- c. Subinvolution of uterus
- d. Engorgement of breasts

ANSWERS

Ans 163. (c)

Ans 164. (c)

Ans 165. (b) Dutta Obs 8/e, p 284

Ans 166. (d)

Ans 167. (d)

QUESTIONS

Q. 168 *Expected date of delivery (EDD) is calculated by the following methods except:*

- a. By adding 9 calendar months and 7 days to the first day of LMP
- b. By adding 9 calendar months and 7 days to the last day of LMP
- c. By adding 22 weeks to the date of quickening in primigravida
- d. By adding 266 days to the day of fruitful coitus

Q. 169 *Peak levels of hCG in the urine during pregnancy is seen around:*

- a. 30 days
- b. 45 days
- c. 70 days
- d. 120 days

Q. 170 *True conjugate diameter of the pelvic brim measures:*

- a. 10 cm
- b. 11 cm
- c. 12 cm
- d. 13 cm

Q. 171 *Fertilized ovum is embedded in the endometrium at about which day after fertilization:*

- a. 2nd day
- b. 4th day
- c. 6th day
- d. 10th day

Q. 172 *Engaging diameter in fully flexed vertex presentation is:*

- a. Suboccipitobregmatic
- b. Suboccipitofrontal
- c. Occipitofrontal
- d. Mentovertical

ANSWERS

Ans 168. (b)

Ans 169. (c)

Ans 170. (b)

Ans 171. (c)

Ans 172. (a)

QUESTIONS

Q. 173 *Deep transverse arrest is common in:*

- a. Gynecoid pelvis
- b. Android pelvis
- c. Anthropoid pelvis
- d. Flat pelvis

Q. 174 *Commonest cause of first trimester abortion is:*

- a. Cervical incompetence
- b. Uterine malformation
- c. Chromosomal abnormalities
- d. Tuberculosis

Q. 175 *The most common cause of nonengaged head at term is:*

- a. Hydrocephalus
- b. Cephalopelvic disproportion
- c. Deflexion of head
- d. Hydramnios

Q. 176. *The parameters measured by USG to assess the gestational age of the fetus are all except:*

- a. Biparietal diameter
- b. Femur length
- c. Crown rump length
- d. Fetal weight

Q. 177 *The commonest cause of transverse lie is:*

- a. Multiparity
- b. Placenta previa
- c. Contracted pelvis
- d. Congenital malformation of uterus

ANSWERS

Ans 173. (b)

Ans 174. (c)

Ans 175. (c)

Ans 176. (d)

Ans 177. (a)

QUESTIONS

Q. 178 *The following placental hormones are protein hormones except:*

- a. Human chorionic gonadotropin (hCG)
- b. Human placental lactogen (HPL)
- c. Progesterone
- d. Pregnancy-specific β -1 glycoprotein (PSBG)

Q. 179 *Longest anteroposterior diameter of the pelvic inlet is seen in:*

- a. Anthropoid pelvis
- b. Android pelvis
- c. Platypelloid pelvis
- d. Gynecoid pelvis

Q. 180 *All of the following are associated with polyhydramnios except:*

- a. Anencephaly
- b. Diabetes in pregnancy
- c. Renal agenesis (bilateral)
- d. Esophageal atresia

Q. 181 *The Pinard's maneuver is done in:*

- a. Breech delivery when legs are extended
- b. As an adjuvant to version and extraction
- c. In forceps rotation maneuvers
- d. During conversion in face presentation

Q. 182 *The following are used in obstetrics as tocolytic agents except:*

- a. Isoxsuprine hydrochloride
- b. Salbutamol
- c. Aspirin
- d. Oxytocin

ANSWERS

Ans 178. (c)

Ans 179. (a)

Ans 180. (c)

Ans 181. (a)

Ans 182. (d)

QUESTIONS

Q. 183 *The diameter of cervical canal of the full dilatation during labor is:*

- a. 6 cm
- b. 8 cm
- c. 10 cm
- d. 12 cm

Q.184 *The internal os is closed in all of the following except:*

- a. Threatened abortion
- b. Inevitable abortion
- c. Tubal abortion
- d. Missed abortion

Q. 185 *All are features of hydatidiform mole except:*

- a. Bleeding p/v following a variable period of amenorrhea
- b. Absence of quickening
- c. Raised hCG
- d. Presence of internal ballotement

Q. 186 *All the diameters are 9.4 cm except:*

- a. Biparietal
- b. Suboccipitobregmatic
- c. Suboccipitofrontal
- d. Submentobregmatic

Q. 187 *The upper boundary of the obstetric outlet is formed by the:*

- a. Plane of inlet
- b. Midpelvic plane
- c. Plane of least pelvic dimension
- d. Plane of the anatomical outlet

ANSWERS

Ans 183. (c)

Ans 184. (b)

Ans 185. (d)

Ans 186. (c)

Ans 187. (c)

QUESTIONS

Q. 188 *The 1st position of face presentation is:*

- a. LMA
- b. RMA
- c. RMP
- d. LMP

Q. 189 *Which antihypertensive drug is contraindicated in pregnancy:*

- a. Methyldopa
- b. Hydralazine
- c. ACE inhibitors
- d. Nifedipine

Q. 190 *Delivery is not possible per vaginam in:*

- a. Persistent mentoposterior position
- b. Mentoanterior position
- c. Occipitoposterior position
- d. Breech with extended legs

Q. 191 *The greenish color of meconium is due to:*

- a. Bile pigment
- b. Altered blood
- c. Bile salts
- d. Desquamated epithelial cells

Q. 192 *DIC in pregnancy is seen in following conditions except:*

- a. Amniotic fluid embolism
- b. Abruptio placentae
- c. Intrauterine death
- d. Threatened abortion

ANSWERS

Ans 188. (c)

Ans 189. (c)

Ans 190. (a)

Ans 191. (a)

Ans 192. (d)

QUESTIONS

Q. 193 *Shortest diameter of pelvic inlet in gynecoid pelvis is:*

- a. True conjugate
- b. Obstetric conjugate
- c. Transverse diameter
- d. Oblique diameter

Q. 194 *Lovset's maneuver is done for:*

- a. Delivery of after-coming head
- b. Delivery of legs
- c. Delivery of arms
- d. Delivery of placenta

Q. 195 *Relationship between different parts of fetus with one another is called:*

- a. Lie
- b. Presentation
- c. Attitude
- d. Position

Q. 196 *The largest presenting diameter in cephalic presentation is:*

- a. Biparietal diameter
- b. Mentovertical
- c. Suboccipitobregmatic
- d. Submentobregmatic

Q. 197 *Vacuum extraction is indicated in all except:*

- a. Cervix dilated more than 6 cm with vertex presentation
- b. Persistent occipitoposterior position
- c. Deep transverse arrest
- d. Face presentation

ANSWERS

Ans 193. (b)

Ans 194. (c)

Ans 195. (c)

Ans 196. (b)

Ans 197. (d)

QUESTIONS

Q. 198 *The following are true in case of placenta previa except:*

- a. Painless bleeding
- b. Mostly associated with pre-eclampsia
- c. Blood loss is from the mother
- d. Recurrent bleeding

Q. 199 *The presence of lutein cysts in vesicular mole is due to excess:*

- a. FSH
- b. LH
- c. Estrogen
- d. hCG

Q. 200 *Placenta with umbilical cord attached to its margin is called:*

- a. Battledore placenta
- b. Circumvallate placenta
- c. Succenturiate placenta
- d. Velamentous placenta

Q. 201 *Triple test for Down's syndrome is done by using all except:*

- a. Maternal hCG
- b. Maternal estriol
- c. Maternal α -fetoprotein
- d. Maternal HPL

Q. 202 *Causes of intrauterine fetal death are all except:*

- a. Rh-immunization in pregnancy
- b. Severe pregnancy-induced hypertension
- c. Pregnancy with syphilis
- d. Physiological anemia of pregnancy

ANSWERS

Ans 198. (b)

Ans 199. (d)

Ans 200. (a) Dutta Obs 8/e, p 253

Ans 201. (d) Dutta Obs 8/e, p 129

Ans 202. (d)

QUESTIONS

Q. 203 *Commonest cause of first trimester abortion is:*

- a. Cervical incompetence
- b. Uterine malformation
- c. Chromosomal abnormality
- d. Rh-isoimmunization

Q. 204 *Commonest degeneration in a fibroid uterus during pregnancy:*

- a. Hyaline
- b. Fatty
- c. Cystic
- d. Red degeneration

Q. 205 *Common benign ovarian tumor with potentiality of torsion in pregnancy:*

- a. Dermoid cyst
- b. Pseudomucinous cyst adenoma
- c. Corpus luteum of pregnancy
- d. Papilliferous cyst

Q. 206 *Fundal height of uterus is more than the period of gestation in all except:*

- a. Multifetal gestation
- b. Anencephaly
- c. Hydatidiform mole
- d. Intrauterine fetal death

Q. 207 *Human placenta develops predominantly from:*

- a. Chorion frondosum
- b. Decidua basalis
- c. Decidua capsularis
- d. Decidua parietalis

ANSWERS

Ans 203. (c)

Ans 204. (d) Dutta Obs 8/e, p 359

Ans 205. (a) Dutta Obs 8/e, p 360

Ans 206. (d)

Ans 207. (a)

QUESTIONS

Q. 208 *Engaging diameter in face presentation:*

- a. Submentobregmatic
- b. Submentovertical
- c. Occipitofrontal
- d. Mentovertical

Q. 209 *Treatment of choice in a case of IUFD:*

- a. Immediate delivery
- b. Surgical: LSCS
- c. Induction with ARM
- d. Medical induction

Q. 210 *Common causes of PROM are all except:*

- a. Bacterial vaginosis
- b. Malpresentation
- c. Iatrogenic
- d. Cervical incompetence

Q. 211 *All belong to gestational trophoblastic tumor except:*

- a. Hydatidiform mole
- b. Choriocarcinoma
- c. Placental site trophoblastic tumor
- d. Tubal mole

Q. 212 *Best diagnosis of early pregnancy could be done by:*

- a. Plasma progesterone level
- b. Urine for pregnancy test
- c. TVS
- d. Presence of corpus luteum (CL) of pregnancy

ANSWERS

Ans 208. (a)

Ans 209. (d)

Ans 210. (c)

Ans 211. (d)

Ans 212. (c)

QUESTIONS

Q. 213 *Lowest hCG titer for evaluation of hydatidiform mole is:*

- a. 10,000 IU/L
- b. 40,000 IU/L
- c. 30,000 IU/L
- d. 1,00,000 IU/L

Q. 214 *Most common chromosomal pattern in hydatidiform mole is:*

- a. 46 XX
- b. 45 XO
- c. 69 XXY
- d. 69 XXX

Q. 215 *Common causes of perinatal mortality are all except:*

- a. Postdatism
- b. Intrapartum asphyxia
- c. Congenital abnormality
- d. Infections

Q. 216 *The most common cause of nonengagement of head at term:*

- a. Hydrocephalus
- b. Deflexed head
- c. Full-bladder
- d. Congenital goiter

Q. 217 *Maternal mortality could be reduced by:*

- a. Proper ANC
- b. By screening high-risk mother
- c. Providing emergency obstetric care
- d. All of the above

ANSWERS

Ans 213. (d)

Ans 214. (a)

Ans 215. (a)

Ans 216. (b)

Ans 217. (d)

QUESTIONS

Q. 218 *All may be the causes of nonimmune hydrops fetalis except:*

- a. Rh-isoimmunization
- b. Diabetes in pregnancy
- c. Syphilis
- d. Fetal cardiac malformation

Q. 219 *Bishop's scoring is essential for management of all except:*

- a. Induction of labor
- b. Postmature pregnancy
- c. Elective LSCS
- d. Severe pre-eclampsia

Q. 220 *Fetal risk in postdated pregnancy is due to all except:*

- a. Macrosomia
- b. Meconium aspiration
- c. Shoulder dystocia
- d. Neonatal jaundice

Q. 221 *All are synonymous except:*

- a. Blighted ovum
- b. An embryonic gestational sac
- c. Absence of fetal pole
- d. Presence of yolk sac

Q. 222 *Bleeding of fetal origin is confirmed by:*

- a. Diagnosis of vasaprevia
- b. Singer's test
- c. Placenta circumvallate
- d. Abruptio placentae

ANSWERS

Ans 218. (a)

Ans 219. (c)

Ans 220. (d)

Ans 221. (d)

Ans 222. (b)

QUESTIONS

Q. 223 *Prophylactically Rh +ve anti-D gammaglobulin may be given in all Rh -ve mother with Rh +ve father except:*

- a. Before conception
- b. After MTP
- c. During pregnancy
- d. Within 72 hours of delivery

Q. 224 *Breastfeeding should be started:*

- a. Immediately after birth
- b. 6 hours after birth
- c. 12 hours after birth
- d. 24 hours after birth

Q. 225 *Localization of placenta is best done by:*

- a. Displacement radiography
- b. Isotopic scanning
- c. Ultrasonography
- d. Clinical methods

Q. 226 *Missed abortion at 16 weeks of gestation:*

- a. Internal os is open
- b. Fresh bleeding
- c. No fetal movements in USG
- d. USG-fetal heart present

Q. 227 *Shortest diameter of inlet in female pelvis:*

- a. True conjugate
- b. Obstetric conjugate
- c. Diagonal conjugate
- d. Left oblique diameter

ANSWERS

Ans 223. (a)

Ans 224. (a)

Ans 225. (c)

Ans 226. (c)

Ans 227. (b)

QUESTIONS

Q. 228 *Ultrasonography at 10 weeks can diagnose:*

- a. Hydrocephalus
- b. Microcephalus
- c. Anencephaly
- d. Abruptio placentae

Q. 229 *Diagnosis of 2nd stage of labor:*

- a. Rupture of bag of water
- b. 10 cm dilatation of cervix
- c. Bearing down pain
- d. Meconium-stained liquor

Q. 230 *Uterus after delivery at term normally weighs:*

- a. 200 gm
- b. 600 gm
- c. 800 gm
- d. 1000 gm

Q. 231 *Jacquemier's sign is:*

- a. Bluish discoloration of vagina in early pregnancy
- b. Softening of cervix
- c. Regular painless contractions of gravid uterus
- d. Nausea and vomiting in early pregnancy

Q. 232 *Milk secretion after childbirth is due to:*

- a. Withdrawal of oestrogen and progesterone
- b. Production of prolactin
- c. None of the above
- d. All of the above

ANSWERS

Ans 228. (c)

Ans 229. (b)

Ans 230. (d)

Ans 231. (a) Dutta Obs 8/e, p 74

Ans 232. (d) Dutta Obs 8/e, p 172

QUESTIONS

Q. 233 *Characteristics of placenta previa are all except:*

- a. Painless and causeless bleeding
- b. Uterus large, hard and tender
- c. Fetal parts easily felt
- d. Presenting part high up

Q. 234 *PIH is diagnosed by all except:*

- a. High BP
- b. Edema
- c. Albuminuria
- d. High blood glucose level

Q. 235 *Contraindications of oxytocin in labor are all except:*

- a. Multigravida
- b. Malpresentation
- c. Heart disease
- d. Diabetes

Q. 236 *Criteria for application of forceps are all except:*

- a. Head should be engaged
- b. Pelvis must be adequate
- c. Cervix should be at least 8 cm dilated
- d. Membrane should be ruptured

Q. 237 *Umbilical cord contains:*

- a. Two arteries and two veins
- b. Two veins and one artery
- c. Two arteries and one vein
- d. One artery and one vein

ANSWERS

Ans 233. (b)

Ans 234. (d)

Ans 235. (d)

Ans 236. (c) Dutta Obs 8/e, p 655

Ans 237. (c) Dutta Obs 8/e, p 44

QUESTIONS

Q. 238 *From which layer placenta gets separated:*

- a. Basal layer
- b. Spongy layer
- c. Superficial layer
- d. Compact layer

Q. 239 *Constriction ring is associated with all except:*

- a. Injudicious use of oxytocics
- b. Premature rupture of membranes
- c. Obstructed labor
- d. Premature instrumentation

Q. 240 *Symmetrical IUGR may be due to:*

- a. Chromosomal anomaly
- b. TORCH infection
- c. Both of the above
- d. None of the above

Q. 241 *Phlegmasia alba dolens is due to thrombophlebitis of:*

- a. Right ovarian vein into inferior vena cava
- b. Left ovarian vein to left renal vein
- c. Retrograde extension to iliofemoral vein
- d. Popliteal vein

Q. 242 *Subpubic angle is narrow in:*

- a. Gynecoid pelvis
- b. Anthropoid pelvis
- c. Android pelvis
- d. Platypelloid pelvis

ANSWERS

Ans 238. (b)

Ans 239. (c) Dutta Obs 8/e, p 419

Ans 240. (c) Dutta Obs 8/e, p 535

Ans 241. (c) Dutta Obs 8/e, p 509

Ans 242. (c) Dutta Obs 8/e, p 403

QUESTIONS

Q. 243 *Causes of hydramnios are all except:*

- a. Anencephaly
- b. Spina bifida
- c. Diabetes mellitus
- d. Hypothyroidism

Q. 244 *Crowning is known to happen when:*

- a. head is at inlet
- b. head is at perineum
- c. head is at ischial spine
- d. head is at perineum and there is no recession

Q. 245 *Mechanism of central separation of placenta is known as:*

- a. Matthews Duncan
- b. Schultze
- c. Letymen
- d. Naegele's

Q. 246 *In transverse lie Pawlik grip is:*

- a. Full
- b. Empty
- c. None of the above
- d. Head on one side

Q. 247 *Estimation of glycosylated hemoglobin A (HbA1C) can predict affection of fetus before:*

- a. 14 weeks
- b. 16 weeks
- c. 18 weeks
- d. 20 weeks

ANSWERS

Ans 243. (d)

Ans 244. (d) Dutta Obs 8/e, p 148

Ans 245. (b)

Ans 246. (b)

Ans 247. (a) Dutta Obs 8/e, p 330

QUESTIONS

Q. 248 *Dose of anti-D gammaglobulin following 22 weeks of abortion is:*

- a. 300 µgm
- b. 150 µgm
- c. 100 µgm
- d. 50 µgm

Q. 249 *Most common cause of 1st trimester abortion is:*

- a. Incompetent os
- b. Congenital defects in fetus
- c. Chromosomal defects in fetus
- d. Hormonal causes

Q. 250 *DIC occurs in all, except:*

- a. Amniotic fluid embolism
- b. Abruptio placentae
- c. Threatened abortion
- d. Intrauterine fetal death

Q. 251 *Renal agenesis is associated with:*

- a. Oligohydramnios
- b. Hydramnios
- c. Anencephaly
- d. Tracheoesophageal fistula

Q. 252 *Which one does not cross through placenta:*

- a. Warfarin
- b. Heparin
- c. Morphine
- d. Naloxone

ANSWERS

Ans 248. (a) Dutta Obs 8/e, p 390

Ans 249. (c) Dutta Obs 8/e, p 187

Ans 250. (c)

Ans 251. (a)

Ans 252. (b) Dutta Obs 8/e, p 584

QUESTIONS

Q. 253 *Red degeneration of uterine fibroid in pregnancy is most common in:*

- a. First trimester
- b. Second trimester
- c. Third trimester
- d. Puerperium

Q. 254 *All predispose to isoimmunization in an Rh-ve pregnant mother, except:*

- a. External cephalic version
- b. Advanced maternal age
- c. Antepartum hemorrhage
- d. Cesarean section

Q. 255 *Chorionic villus sampling is done in all, except:*

- a. Thalassemia
- b. Phenylketonuria
- c. Down's syndrome
- d. Neural tube defect

Q. 256 *Pelvis should be assessed in a primigravida at:*

- a. 37 weeks
- b. 38 weeks
- c. 40 weeks
- d. Labor

Q. 257 *Which of the following is the most reliable indicator of ectopic gestation:*

- a. No gestational sac in uterine cavity by USG
- b. Arias-Stella reaction
- c. Culdocentesis showing blood in the cul-de-sac
- d. Absence of the normal doubling of hCG level

ANSWERS

Ans 253. (b)

Ans 254. (b) Dutta Obs 8/e, p 387

Ans 255. (d)

Ans 256. (d) Dutta Obs 8/e, p 213

Ans 257. (a) Dutta Obs 8/e, p 213

QUESTIONS

Q. 258 *Peak level of hCG occurs in normal pregnancy at:*

- a. 30–40 days
- b. 10–20 days
- c. 60–70 days
- d. 100–110 days

Q. 259 *Amount of water retained during normal pregnancy at term is:*

- a. 4.5 liters
- b. 6 liters
- c. 8.5 liters
- d. 10 liters

Q. 260 *Changes in heart and circulation in a normal pregnancy are all except:*

- a. Cardiac output is increased
- b. Pulse rate is increased
- c. Blood viscosity is increased
- d. Venous pressure is increased

Q. 261 *Minimum number of antenatal visits in an uncomplicated pregnancy should be:*

- a. 4 times
- b. 8 times
- c. 12 times
- d. 16 times

Q. 262 *Following are related to inlet of the pelvis except:*

- a. Angle of inclination is 55°
- b. True conjugate is 11 cm
- c. Obstetric conjugate is 12 cm
- d. Diagonal conjugate is 12 cm

ANSWERS

Ans 258. (c)

Ans 259. (b) Dutta Obs 8/e, p 57

Ans 260. (c) Dutta Obs 8/e, p 69

Ans 261. (a) Dutta Obs 8/e, p 111

Ans 262. (c) Dutta Obs 8/e, p 100

QUESTIONS

Q. 263 *Indications for induction of labor are all except:*

- a. Postmaturity
- b. Transverse lie
- c. Pre-eclampsia
- d. Intrauterine fetal death

Q. 264 *Important causes of maternal death are all except:*

- a. Hemorrhage
- b. Sepsis
- c. Hypertensive disorders in pregnancy
- d. Thrombosis

Q. 265 *Match the following:*

- | | |
|-----------------|-------------------------------------|
| a. Craniotomy | 1. Division of clavicle(s) |
| b. Evisceration | 2. Fetal head is severed from trunk |
| c. Decapitation | 3. Removal of viscera in piece meal |
| d. Cleidotomy | 4. Perforation of fetal head |

Q. 266 *Regarding anemia in pregnancy, all are correct except:*

- a. Hemoglobin level is usually less than 10 gm/dL
- b. Hemorrhage is the commonest cause
- c. Iron supplementation is a must
- d. Blood transfusion may be needed

Q. 267 *Severe pre-eclampsia is characterized by all except:*

- a. Diastolic BP > 110 mmHg
- b. Oliguria
- c. Proteinuria > 5 gm/day
- d. Massive pedal edema

ANSWERS

Ans 263. (b) Dutta Obs 8/e, p 598

Ans 264. (d) Dutta Obs 8/e, p 685

Ans 265. a = 4; b = 3; c = 2; d = 1. (Dutta Obs 8/e, p 666)

Ans 266. (b) Dutta Obs 8/e, p 303

Ans 267. (d) Dutta Obs 8/e, p 255

QUESTIONS

Q. 268 *Prolonged labor may be due to all except:*

- a. Cephalopelvic disproportion
- b. Malpresentation
- c. Precipitate labor
- d. Abnormal uterine action

Q. 269 *False statement regarding hCG is:*

- a. It is a glycoprotein hormone
- b. The level peaks at term pregnancy
- c. Doubling time is longer in ectopic pregnancy than in normal pregnancy
- d. Subunit cross reacts with subunit of LH

Q. 270 *APH is defined as hemorrhage from or within the genital tract at any time of pregnancy from 28 weeks to:*

- a. Onset of labor
- b. End of first stage
- c. End of second stage
- d. End of third stage

Q. 271 *All of the following rises physiologically in pregnancy except:*

- a. Heart rate
- b. Cardiac output
- c. Blood volume
- d. Blood pressure

Q. 272 *White's classification of diabetes mellitus in pregnancy is based on all except:*

- a. Onset of diabetes (age)
- b. Duration of diabetes
- c. Level of hyperglycemia
- d. Need of insulin

ANSWERS

Ans 268. (c) Dutta Obs 8/e, p 415

Ans 269. (b) Dutta Obs 8/e, p 66

Ans 270. (c) Dutta Obs 8/e, p 282

Ans 271. (d) Dutta Obs 8/e, p 60

Ans 272. (c) Dutta Obs 8/e, p 328

QUESTIONS

Q. 273 *Absence of one ala of pelvis is known as:*

- a. Robert's pelvis
- b. Naegele's pelvis
- c. Platypelloid pelvis
- d. Davidson's pelvis

Q. 274 *Shortest diameter of fetal skull is:*

- a. Suboccipitobregmatic
- b. Bitemporal
- c. Suboccipitofrontal
- d. Biparietal

Q. 275 *Commonest cause of breech presentation is:*

- a. Prematurity
- b. Postmaturity
- c. Diabetes mellitus
- d. Contracted pelvis

Q. 276 *Which type of pelvis is associated with higher incidence of face to pubis delivery:*

- a. Gynecoid
- b. Anthropoid
- c. Platypelloid
- d. Android

Q. 277 *A 35-year-old female with the previous history of birth of a baby with Down's syndrome should ideally be screened by:*

- a. Chorionic villus biopsy
- b. Amniocentesis
- c. Cordocentesis
- d. Triple test

ANSWERS

Ans 273. (b)

Ans 274. (b)

Ans 275. (a)

Ans 276. (b)

Ans 277. (a)

QUESTIONS

Q. 278 *Retention of urine in a pregnant woman with a retroverted uterus usually occurs at:*

- a. 6–10 weeks
- b. 12–16 weeks
- c. 20–24 weeks
- d. 28–32 weeks

Q. 279 *Snow storm appearance in USG is seen in:*

- a. Ectopic pregnancy
- b. Hydatidiform mole
- c. Hydramnios
- d. Hydrocephalus

Q. 280 *All the following are indications for immediate termination of pregnancy in placenta previa except:*

- a. Pregnancy beyond 37 weeks of gestation
- b. Transverse lie
- c. Patient in labor
- d. Continuous bleeding

Q. 281 *A pregnant woman presents with red degeneration of fibroid management. This is called:*

- a. Myomectomy
- b. Hysterectomy
- c. Termination of pregnancy
- d. Conservative

Q. 282 *Most constant symptom in disturbed ectopic pregnancy is:*

- a. Amenorrhea
- b. Bleeding PV
- c. Pain in lower abdomen
- d. Passage of decidual cast

ANSWERS

Ans 278. (b) Dutta Obs 8/e, p 361

Ans 279. (b)

Ans 280. (b)

Ans 281. (d)

Ans 282. (c)

QUESTIONS

Q. 283 *According to WHO, anemia in pregnancy is diagnosed when hemoglobin level is less than:*

- a. 9 gm/dL
- b. 10 gm/dL
- c. 11 gm/dL
- d. 12 gm/dL

Q. 284 *All of the following predispose to isoimmunization in an Rh -ve female except:*

- a. Elderly primigravida
- b. Antepartum hemorrhage
- c. Operative delivery
- d. Postdated pregnancy

Q. 285 *All are used in preterm labor as tocolytics except:*

- a. Ethanol
- b. Ritodrine
- c. Magnesium sulfate
- d. Dexamethasone

Q. 286 *All of the following are actively transported via placenta except:*

- a. Amino acids
- b. Vitamin C
- c. Vitamin D
- d. Iron

Q. 287 *Bilateral renal agenesis is associated with:*

- a. Oligohydramnios
- b. Anencephaly
- c. Preterm labor
- d. Tracheoesophageal fistula

ANSWERS

Ans 283. (c)

Ans 284. (a)

Ans 285. (d)

Ans 286. (c)

Ans 287. (a)

QUESTIONS

Q. 288 *Commonest cause of first trimester abortion is:*

- a. Hormonal causes
- b. Incompetent cervix
- c. Chromosomal defect
- d. Antiphospholipid syndrome

Q. 289 *Disseminated intravascular coagulation occurs commonly in all except:*

- a. Amniotic fluid embolism
- b. Abruptio placentae
- c. Post-term pregnancy
- d. Missed abortion

Q. 290 *All are the high-risk factors for postpartum hemorrhage except:*

- a. Previous cesarean delivery
- b. Prolonged labor
- c. Women with normal BMI
- d. Twin deliveries

Q. 291 *Positive evidence of pregnancy are all except:*

- a. Perception of fetal movements by the mother
- b. Identification of FHS
- c. Perception of fetal movement by the examiner
- d. Recognition of fetus or embryo by USG

Q. 292 *Most commonly used antihypertensive drug during pregnancy:*

- a. Nifedipine
- b. Methyldopa
- c. Frusemide
- d. Hydralazine

ANSWERS

Ans 288. (c)

Ans 289. (c)

Ans 290. (c)

Ans 291. (a) Dutta Obs 8/e, p 81

Ans 292. (b) Dutta Obs 8/e, p 581

QUESTIONS

Q. 293 *Most unfavorable type of breech presentation:*

- a. Knee presentation
- b. Footling breech
- c. Frank breech
- d. Flexed breech

Q. 294 *Estimated uteroplacental blood flow at term:*

- a. 100–200 mL
- b. 600–750 mL
- c. 1000 mL
- d. None

Q. 295 *Estimated total surface area of chorionic villi in human placenta at term is approximately:*

- a. 10 m²
- b. 1 m²
- c. 1.5 m²
- d. 100 m²

Q. 296 *Histological components of placental barrier are all except:*

- a. Trophoblast
- b. Decidua
- c. Stroma of intervillous space
- d. Fetal capillary wall

Q. 297 *Substances with molecular mass of less than which of the following easily diffuses through placental barrier:*

- a. 50 daltons
- b. 100 daltons
- c. 500 daltons
- d. 1000 daltons

ANSWERS

Ans 293. (b)

Ans 294. (b) Dutta Obs 8/e, p 36

Ans 295. (a) Dutta Obs 8/e, p 35

Ans 296. (b) Dutta Obs 8/e, p 41

Ans 297. (d) Dutta Obs 8/e, p 39

QUESTIONS

Q. 298 *Suppression of lactation is best achieved by:*

- a. Estrogen
- b. Estrogen + Testosterone
- c. Vitamin B₆
- d. Bromocriptine

Q. 299 *What proportion of spontaneous abortions goes unrecognized clinically:*

- a. 10%
- b. 30%
- c. 50%
- d. 60%

Q. 300 *The commonest chromosomal anomaly causing abortion is:*

- a. Monosomy X
- b. Autosomal trisomy
- c. Sex chromosome polysomy
- d. Triploidy

Q. 301 *In pre-eclampsia, proteinuria usually develops:*

- a. Before hypertension
- b. Before excessive weight gain
- c. After hypertension but before excessive weight gain
- d. After hypertension and excessive weight gain

Q. 302 *Nitabauch's layer is absent in:*

- a. Placenta previa
- b. Abruptio placentae
- c. Vasa previa
- d. Placenta accreta

ANSWERS

Ans 298. (d) Dutta Obs 8/e, p 173

Ans 299. (a)

Ans 300. (b) Dutta Obs 8/e, p 186

Ans 301. (d) Dutta Obs 8/e, p 264

Ans 302. (d) Dutta Obs 8/e, p 35, 486

QUESTIONS

Q. 303 *Daily folic acid requirement during pregnancy:*

- a. 50–100 micrograms
- b. 100–200 micrograms
- c. 300–500 micrograms
- d. 1000–1200 micrograms

Q. 304 *Manning scoring (fetal biophysical profile) includes assessment of all except:*

- a. Fetal urine production
- b. Fetal breathing movement
- c. Amniotic fluid volume
- d. Fetal movement

Q. 305 *Presence of which of the following in amniotic fluid more definitely indicates diagnosis of open neural tube defect of fetus:*

- a. Raised alpha-fetoprotein
- b. Acetylcholinesterase
- c. Sphingomyelin
- d. Unconjugated estriol

Q. 306 *For cordocentesis umbilical vein is punctured at which part of umbilical cord:*

- a. Anywhere
- b. At the middle
- c. Near its insertion at placenta
- d. Near its insertion at umbilicus

Q. 307 *External cephalic version is more likely to be successful in all conditions except:*

- a. Presenting part not engaged
- b. Adequate liquor
- c. Patient not obese
- d. Fetal back placed posteriorly

ANSWERS

Ans 303. (c) Dutta Obs 8/e, p 117

Ans 304. (a) Dutta Obs 8/e, p 122

Ans 305. (a) Dutta Obs 8/e, p 128

Ans 306. (c) Dutta Obs 8/e, p 130

Ans 307. (d) Dutta Obs 8/e, p 440, 663

QUESTIONS

Q. 308 *Mcafee and Johnson regime is used in the management of:*

- a. Accidental hemorrhage
- b. Placenta previa
- c. Eclampsia
- d. Atonic PPH

Q. 309 *Cervical ripening involves all except:*

- a. Collagen breakdown
- b. Increase in hyaluronic acid
- c. Decreases in cervical dermatan sulfate
- d. Decrease in cervical smooth muscle

Q. 310 *Amount of liquor volume is highest at which time of pregnancy?*

- a. 34 weeks
- b. 37 weeks
- c. 40 weeks
- d. 42 weeks

Q. 311 *Episiotomy aims at:*

- a. Enlarging the vaginal introitus
- b. Straightening the curved birth canal
- c. Both
- d. None

Q. 312 *All are tocolytic agents except:*

- a. Nifedipine
- b. Magnesium sulfate
- c. Atosiban
- d. RU 486

ANSWERS

Ans 308. (b) Dutta Obs 8/e, p 290

Ans 309. (d) Dutta Obs 8/e, p 600

Ans 310. (b) Dutta Obs 8/e, p 43

Ans 311. (c) Dutta Obs 8/e, p 647

Ans 312. (d) Dutta Obs 8/e, p 583

QUESTIONS

Q. 313 *Induction of labor is usually avoided in:*

- a. Malpresentation
- b. PIH
- c. Diabetes
- d. Fetal growth restriction (FGR)

Q. 314 *The following is true about fetal hemoglobin (HbF):*

- a. It is less resistant than adult Hb to denaturation by acid
- b. It has higher binding to 2,3 DPG
- c. Accounts for 90% of all fetal Hb at 20 weeks of gestation
- d. Consists of two delta and two alpha chains

Q. 315 *The following is true about lactation:*

- a. Progesterone promotes growth of ducts rather than alveoli
- b. An intact nerve supply is needed for growth of mammary glands
- c. Prolactin causes milk ejection
- d. Maintenance of lactation needs suckling

Q. 316 *All are true about breastmilk except:*

- a. Colostrum contains large quantities of protein
- b. The main carbohydrate is glucose
- c. There is less protein than in cow's milk
- d. There are fewer minerals than in cow's milk

Q. 317 *The following is true about characteristics of shock:*

- a. Hypovolemic shock occurs after loss of 10% of normal blood volume
- b. Tissue hypoxia leads to metabolic alkalosis
- c. The circulation in the adrenal gland is spared unless the condition is extreme
- d. Endotoxic shock is caused by protein toxins

ANSWERS

Ans 313. (a) Dutta Obs 8/e, p 598

Ans 314. (c) Dutta Obs 8/e, p 47

Ans 315. (d) Dutta Obs 8/e, p 172

Ans 316. (b) Dutta Obs 8/e, p 519, 524

Ans 317. (c) Dutta Obs 8/e, p 700, 701

QUESTIONS

Q. 318 *All are true about drug administration to a pregnant woman except:*

- a. Valproate therapy in pregnancy may cause fetal neural tube defect
- b. Aminoglycosides may cause 8th nerve damage in the fetus
- c. Paracetamol may cause kernicterus
- d. Tetracyclines may damage fetal bone and teeth

Q. 319 *All are true about drugs affecting myometrial contraction except:*

- a. Oxytocin acts via receptors on the cell surface
- b. $\text{PGF}_{2\alpha}$ produces sustained uterine contraction
- c. Ergometrine acts by 40–60 seconds of IV injection
- d. Half-life of oxytocin is 5–10 minutes

Q. 320 *The following are related to the diagnosis of iron deficiency anemia except:*

- a. Low serum iron
- b. MCH is the most sensitive index
- c. MCV is less than 80 mm^3
- d. Low serum ferritin

Q. 321 *In neonatal resuscitation:*

- a. Apgar score at 1 minute is more valuable
- b. External cardiac massage is started when heart rate is 100/minute
- c. Acrocyanosis indicates intubation and PPV with 100% O_2
- d. Sodium bicarbonate is given when pH is < 7.2

Q. 322 *The following are ultrasonographic markers for increased chromosomal abnormality except:*

- a. Nuchal translucency $> 3 \text{ mm}$
- b. Short femur
- c. Rockerbottom feet
- d. Jejunal atresia

ANSWERS

Ans 318. (c) Dutta Obs 8/e, p 587, 588

Ans 319. (d) Dutta Obs 8/e, p 573

Ans 320. (b) Dutta Obs 8/e, p 307

Ans 321. (d) Dutta Obs 8/e, p 543, 546

Ans 322. (d) Dutta Obs 8/e, p 735

QUESTIONS

Q. 323 *The most common cause of miscarriage in the second trimester of pregnancy is:*

- a. Uterine malformation
- b. Fibroid uterus
- c. Cervical incompetence
- d. Thyroid dysfunction

Q. 324 *Oxytocin infusion is contraindicated in all except:*

- a. Obstructed labor
- b. Grand multipara
- c. Augmentation of labor
- d. Malpresentation

Q. 325 *The most common cause of postpartum hemorrhage is:*

- a. Atonicity of the uterus
- b. Trauma to the genital tract
- c. Forceps delivery
- d. Blood coagulopathy

Q. 326 *Pre-eclampsia is characterized by:*

- a. Hypertension and edema
- b. Hypertension and proteinuria
- c. Hypertension and convulsions
- d. Hemolysis, low platelet count with or without hypertension

Q. 327 *Regarding cesarean section, all are correct except:*

- a. Cephalopelvic disproportion is a common indication
- b. Lower segment scar heals better than the classical scar
- c. Lower segment vertical incision is commonly done
- d. Fetal head is delivered commonly by the hand

ANSWERS

Ans 323. (c) Dutta Obs 8/e, p 187

Ans 324. (c) Dutta Obs 8/e, p 574

Ans 325. (a) Dutta Obs 8/e, p 474

Ans 326. (b) Dutta Obs 8/e, p 256

Ans 327. (c) Dutta Obs 8/e, p 669

QUESTIONS

Q. 328 *Regarding respiratory distress syndrome of the newborn, all are correct except that:*

- a. It is common with preterm birth
- b. Hyperthermia is a precipitating factor
- c. It may be associated with cesarean delivery
- d. It is common in a newborn of a diabetic mother

Q. 329 *Threatened miscarriage is diagnosed by all except:*

- a. Abdominal pain with slight vaginal bleeding
- b. Uterine size is normal
- c. Fetus is alive on USG examination
- d. Retroplacental hemorrhage may be present

ANSWERS

Ans 328. (b) Dutta Obs 8/e, p 548

Ans 329. (b) Dutta Obs 8/e, Table 16.1 p195..

- **Maternal Pelvis**
- **Fetal Skull**
- **Mechanism of Labor**
- **Labor-Normal, Vaginal Delivery and Management**
- **Labor-Abnormal**
- **Malposition and Malpresentation**

- ❖ **Occiput Posterior Position (OP)**
- ❖ **Breech Presentation**
- ❖ **Face Presentation**
- ❖ **Brow Presentation**
- ❖ **Transverse Lie**
- ❖ **Cord Prolapse**
- ❖ **Compound Presentation**
- ❖ **Unstable Lie**

- **Prolonged (Protracted) Labor**
- **Obstructed Labor**

Chapter Objectives

Candidate should have the knowledge and understanding of:

- Physiology of parturition
- Myometrial contractions
- Assessment of fetal well being
- Labor monitoring
- Labor : induction, augmentation, management
- Deviations from the normal behavior (abnormal labor)



Fig. 4.1: Female pelvis: Anatomically pelvis is held with slight forward tilt, bringing the anterior superior iliac spine and the pubic symphysis in one coronal plane. This will also make the angle of inclination 55° with the horizon (Also see Fig. 4.5).



Fig. 4.2: Obstetric viva table. Discussion may start from maternal pelvis, fetal skull or labor management

MATERNAL PELVIS

Study of bony pelvis is essential from obstetric point of view. Architecture of maternal bony pelvis is extremely important to understand the mechanism of labor and to assess the success of the vaginal delivery. Articulated pelvis is composed of four bones—innominate bones—2, the sacrum and the coccyx. There are four joints that unite the four bones—sacroiliac joints—2, symphysis pubis in front and the sacrococcygeal joint posteriorly and inferiorly.

Anatomically the pelvis is divided into:

False pelvis: The part that lies above the pelvic brim.

True pelvis: The part that lies below the brim.

Brim of the pelvis (inlet): The important landmarks on the brim of the pelvis from anterior to posterior on each side are (Figs 4.1 and 4.3):

- | | |
|---|--|
| (1) Upper border of the symphysis pubis | (6) Iliopectineal line |
| (2) Pubic crest | (7) Sacroiliac articulation |
| (3) Pubic tubercle | (8) Anterior border of ala of the sacrum |
| (4) Pectineal line | (9) Sacral promontory |
| (5) Iliopubic eminence | (10) To be continued with similar borders on the opposite side |

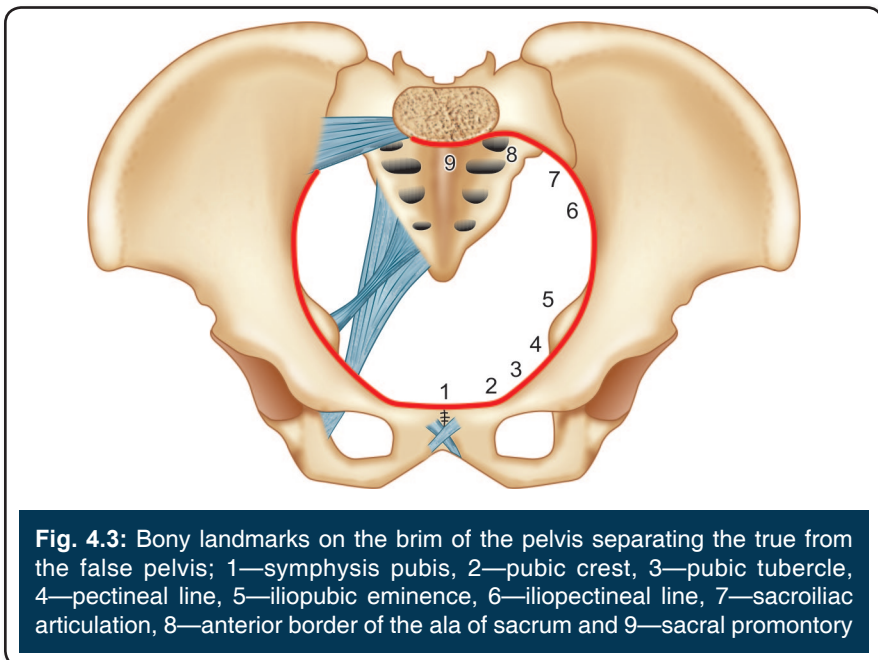


Fig. 4.3: Bony landmarks on the brim of the pelvis separating the true from the false pelvis; 1—symphysis pubis, 2—pubic crest, 3—pubic tubercle, 4—pectineal line, 5—iliopubic eminence, 6—iliopectineal line, 7—sacroiliac articulation, 8—anterior border of the ala of sacrum and 9—sacral promontory

True pelvis: It is bounded anteriorly by symphysis pubis. It measures 4 cm ($1\frac{1}{2}$ inches). Posteriorly it is bounded by the sacrum and the coccyx. It measures 11.5 cm ($4\frac{1}{2}$ inches). True pelvis is divided into:

A. Inlet B. Cavity C. Outlet

Q. What is plane of least pelvic dimension?

Ans. This plane extends from the lower border of the symphysis pubis to the tip of ischial spine and posteriorly it extends upto the tip of 5th sacral vertebra.

Q. What is the significance of the plane of least pelvic dimension?

- Ans.** (1) It is the **narrowest plane** in the pelvis.
- (2) This plane corresponds to the **origin of levator ani muscle**. This is known as **pelvic floor**.
- (3) During the course of mechanism of labor, **internal rotation of the fetal head** takes place at this plane.
- (4) This level marks the beginning of the **forward curve of the pelvic axis**.
- (5) Pudendal nerve hooks around the dorsal surface of the ischial spine and enters the perineal pouch. It is a landmark used for **pudendal nerve block analgesia**.
- (6) The bispinous diameter (10.5 cm): The distance between the tips of two ischial spines is in this plane. **Station of the presenting part** is expressed in either – or + in relation to this plane.

Q. What are the different types of female pelvis?

Ans. Based upon the shape of the inlet (brim), the female pelvis is divided into four parent types:

- ♦ Gynecoid (50%) ♦ Anthropoid (25%) ♦ Android (20%) ♦ Platypelloid (5%).

However, in majority of cases, combination of features is found.

Q. What is diagonal conjugate?

Ans. It is the distance between the lower border of the symphysis pubis and the midpoint on the sacral promontory. It measures 12 cm (4¾ inches).

Q. How do you measure the diagonal conjugate?

Ans. Steps of assessment (Fig. 4.4):

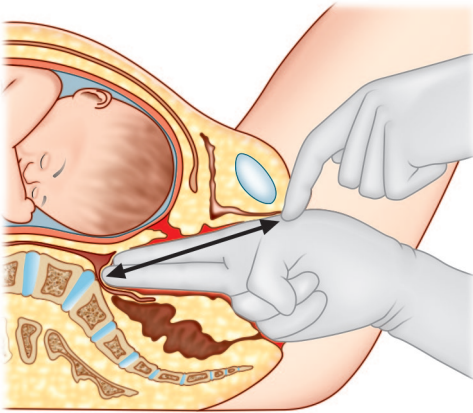


Fig. 4.4: Measurement of diagonal conjugate

How to measure?

Two fingers of gloved right hand are introduced into the vagina along the sacral curvature to reach the sacral promontory. In a normal pelvis, it is usually not felt. The point where the bone recedes from the fingers is the sacral promontory. The radial border of the fingers are then mobilized underneath the symphysis pubis and a mark is made over the gloved index finger. The distance between the marking and the tip of the middle finger is the measurement of diagonal conjugate.

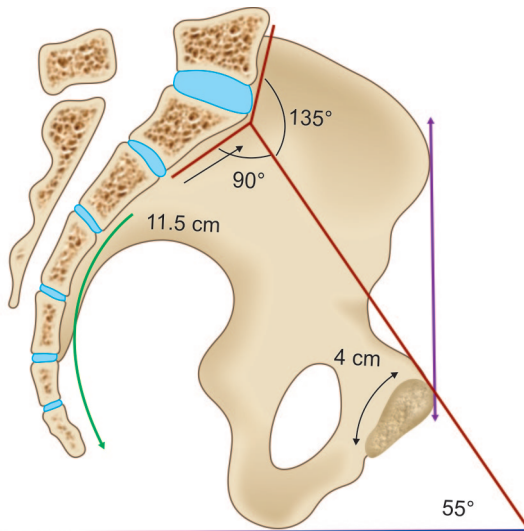
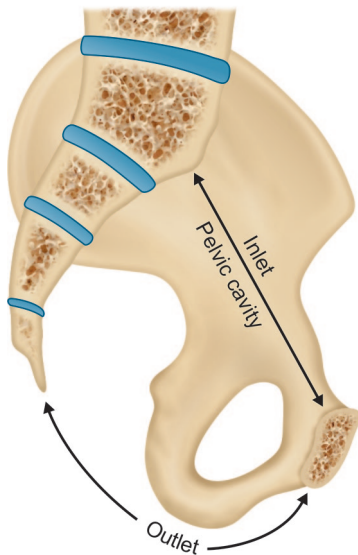


Fig. 4.5: Angle of inclination

Angle of Pelvic Inclination:

Angle of Pelvic Inclination is the angle subtended by the plane of pelvic inlet with the horizon, when the plane of pelvic inlet is extended downwards to meet the ground. It is measured when the woman is in upright standing position. The anterior superior iliac spine and the pubic tubercle are in the same vertical plane. The angle measures about 55°.



Bony pelvic outlet or anatomical pelvic outlet: It is bounded anteriorly by the under surface of the symphysis pubis, laterally by the conjoint ischiopubic rami, ischial tuberosity and sacrotuberous ligament and posteriorly by the tip of the coccyx. (see also Fig. 4.7)

Fig. 4.6: Pelvic outlet

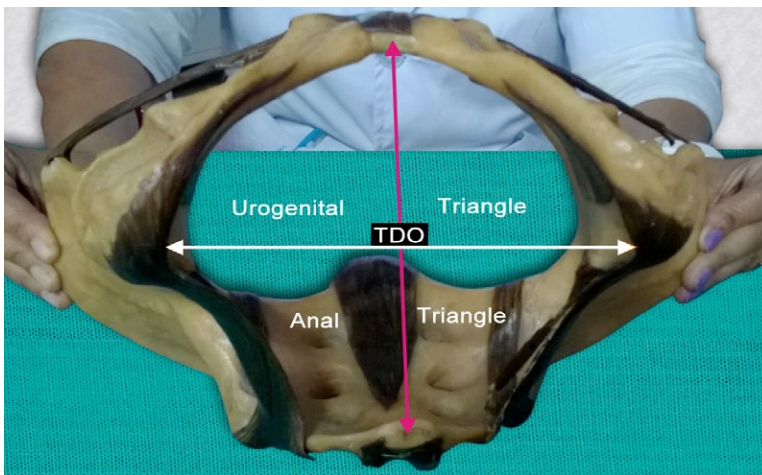


Fig. 4.7: Bony pelvic outlet. (TDO is shown)

Transverse Diameter of the Outlet (TDO): It is the distance between the inner margin of the two ischial tuberosities. It measures 11 cm. Clinically it is measured by placing the four knuckles of the clinched fist placed between the two ischial tuberosities. TDO forms the common base for the two triangular planes. The apex of the anterior triangle (Urogenital) is formed by the inferior border of the pubic arch. The apex of the posterior triangle (anal) is formed by the sacrococcygeal joint.

FETAL SKULL

Fetal skull is arbitrarily divided into several zones of obstetric significance (Fig. 4.8). These are: ♦ Vertex ♦ Brow ♦ Face ♦ Sinciput ♦ Occiput ♦ Fontanelles.

Q. *Mention the different engaging diameters of the skull that come into play from the attitude of complete flexion to complete extension.*

Ans. Complete flexion (vertex): 9.5 cm → Incomplete flexion (vertex): 10 cm → Marked deflexion (Vertex): 11.5 cm → Partial extension (Brow): 14 cm → Incomplete extension (Face): 11.5 cm → Complete extension (Face): 9.5 cm (see Table below)

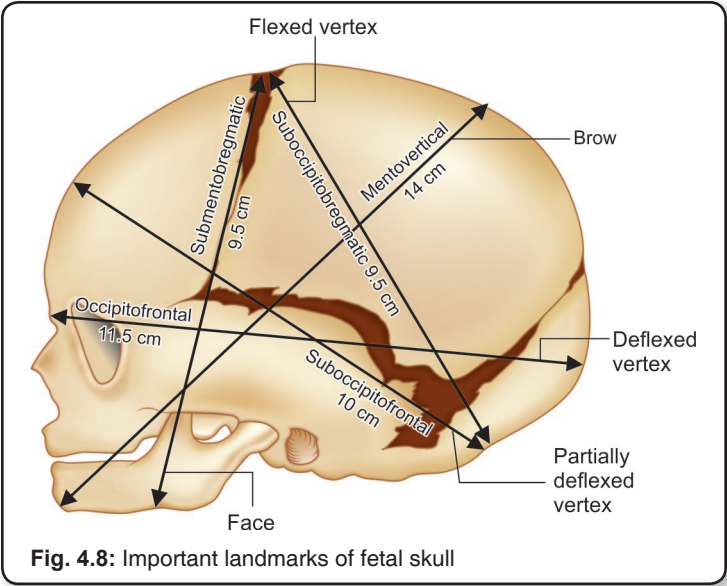


Fig. 4.8: Important landmarks of fetal skull

| | Diameters | Measurement in cm (inches) | Attitude of the head | Presentation |
|----|---|----------------------------|----------------------|--------------|
| 1. | Suboccipitobregmatic—extends from the nape of the neck to the center of the bregma | 9.5 cm (3¾") | Complete flexion | Vertex |
| 2. | Suboccipitofrontal—extends from the nape of the neck to the anterior end of the anterior fontanelle or center of the sinciput | 10 cm (4") | Incomplete flexion | Vertex |
| 3. | Occipitofrontal—extends from the occipital eminence to the root of the nose (glabella) | 11.5 cm (4½") | Marked deflexion | Vertex |
| 4. | Mentovertical—extends from the mid- point of the chin to the highest point on the sagittal suture | 14 cm (5½") | Partial extension | Brow |
| 5. | Submentovertical—extends from junction of floor of the mouth and neck to the highest point on the sagittal suture | 11.5 cm (4½") | Incomplete extension | Face |
| 6. | Submentobregmatic—extends from junction of floor of the mouth and neck to the center of the bregma | 9.5 cm (3¾") | Complete extension | Face |

Q. What are the different types of female pelvis?

Ans. On the basis of the shape of the inlet, female pelvis is divided into four parent types:

A. Gynecoid (50%)

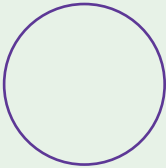
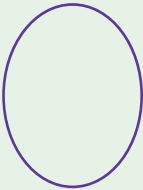

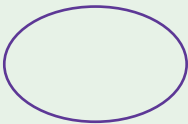
B. Anthropoid (25%)

C. Android (20%)

D. Platypelloid (5%)

Q. What are the important differences in the four types of parent pelvis?

Ans. Difference between four types of pelvis has been described below in tabular form.

| Pelvis type | Inlet | Midcavity | Outlet: subpubic angle |
|------------------------|--|--|--|
| A. Gynecoid | Round  | Divergent Sidewalls, Ischial Spines (IS): Not prominent | Wide (85°) TDO: 11 cm |
| B. Anthropoid | Anteroposteriorly oval  | Straight or divergent Sidewalls Ischial Spines (IS) : Prominent | Slightly narrow (medium) TDO: 11 cm |
| C. Android | Triangular  | Convergent Sidewalls, IS: Prominent | Narrow TDO: <11 cm |
| D. Platypelloid | Transversely oval  | Divergent Side walls, IS: Not prominent | Very wide >90° TDO: 11 cm |

Different diameters of the female bony pelvis have been measured by X-ray pelvimetry and computed tomography (CT). However, CT and X-ray pelvimetry are rarely used for pelvic assessment in labor. **Clinical pelvimetry is the only method of assessing the pelvis in labor.**

MECHANISM OF LABOR

MECHANISM OF NORMAL LABOR

Q. What do you understand by the mechanism of labor?

Ans. It is the series of movements that occur in the fetal head in the process of adaptation during its journey through the pelvis.

Q. What are the principal movements that occur on the fetal head during the course of labor (mechanism of labor)?

Ans. The cardinal movements are:

- (1) **Engagement:** Biparietal diameter passes through the pelvic brim. In a primigravida, engagement usually occurs before the onset of labor, whereas in a multigravida the same may occur during the course of labor.
- (2) **Descent:** It is a continuous process throughout the course of labor.
- (3) **Flexion:** Flexion is achieved when the head meets the resistance of the birth canal (pelvic floor muscles, cervix, pelvic walls) during descent. Flexion brings lesser diameter in the pelvis.
- (4) **Internal rotation:** It is mainly due to: (i) gutter-shaped arrangement of the levator ani muscles (two halves), (ii) pelvic shape having the long anterior-posterior diameter of the outlet to accommodate the long diameter of the fetal head.
- (5) **Crowning:** The biparietal diameter stretches the vulval outlet and there is no recession of the head even when the contractions are over.
- (6) **Extension:** It is the result of final driving force that expels the fetal head out. The uterine contraction force is directed downward and the forces exerted by the pelvic and perineal floor muscles are upward and forward. The resultant force drives the head downward and upward (extension).
- (7) **Restitution:** It is the rotation of the head (45°) due to untwisting of the neck that occurred during internal rotation.
- (8) **External rotation:** It is due to internal rotation of the shoulder.
- (9) **Delivery of the trunk.**

Q. What do you understand by asynclitism? What is its significance?

Ans. See p 181.

LABOR-NORMAL, VAGINAL DELIVERY AND MANAGEMENT

Q. *How do you define labor?*

Ans. **Labor** is the series of changes that take place in the genital organs in an effort to expel the viable fetus from the womb to the outside world through the vagina. Labor begins when the uterine contractions are of sufficient frequency, intensity and duration to cause progressive effacement and dilatation of the cervix.

Q. *What do you understand by delivery?*

Ans. Delivery is the process of expulsion or extraction of a viable fetus out of the womb. Delivery can take place without labor as in elective cesarean delivery (abdominal). However, delivery may be vaginal also (forceps or ventouse delivery).

Q. *What is normal labor?*

Ans. Normal labor fulfills the following criteria: (1) spontaneous onset of term, (2) fetus with vertex presentation, (3) without undue prolongation of labor, (4) spontaneous delivery with minimal aids, and (5) without any complications.

Q. *What is the character of true labor pains?*

Ans. The true labor pains are characterized by:

- (i) Painful uterine contractions (labor pains) at regular intervals.
- (ii) Contractions with increasing intensity and duration.
- (iii) Presence of “show”.
- (iv) Progressive effacement and dilatation of the cervix.
- (v) Formation of the “bag of water”.

Q. *What are the clinical stages of labor?*

Ans. Stages of labor are total three:

First stage begins with onset of true labor pains and ends with full dilatation of the cervix (10 cm). Its duration is 12 hours in a primi and 6 hours in a multi.

Second stage begins with full dilatation of the cervix and ends with delivery of the fetus—duration is 2 hours in a primi and 30 minutes in a multi.

Third stage begins after the delivery of the fetus and ends with the delivery of the placenta and the membranes. Average duration is 15 minutes in both primi and multigravida.

Q. *What is “show”?*

Ans. It is the vaginal discharge of cervical mucus mixed with blood.

Q. *What are the important characteristics of uterine contractions during labor?*

Ans. In a normal labor, the **uterine contractions** should have **adequate**:

- (a) frequency (3–4 contractions every 10 minutes), (b) duration (30–40 seconds for each contraction) and (c) intensity to increase intrauterine pressure. Intensity is considered good when clinically uterine wall cannot be indented by the fingers.

Q. What are the clinical phases of the first stage of labor?

Ans. The first stage is divided into two phases:

- (a) **Latent phase:** It is of variable duration during which cervix becomes pliable and effaced. It ends when cervix is 3–5 cm dilated. Duration of latent phase has minimum effect on the subsequent course of labor.
- (b) **Active phase:** begins when the cervix is 3–5 cm dilated in the presence of uterine contractions. In the active phase, cervix dilates at the rate of 1 cm/hour in a primi and 1.5 cm/hour in a multi. During the active phase, the uterine contractions become regular in terms of frequency, intensity and duration.

Q. What are the different phases of parturition?

Ans. Arbitrarily there are four phases since conception. **Phase 1**—quiescence till the end of pregnancy due to the effects of progesterone, prostacycline and relaxin. **Phase 2**—preparation for labor; **Phase 3**—active labor process (3 clinical stages); **Phase 4**—involution (puerperium).

Q. What are the major changes (events) in the first stage of labor?

Ans. Three major changes (events) are:

- (i) Effacement of the cervix
- (ii) Dilatation of the cervix
- (iii) Formation of the lower uterine segment

Q. What factors are actually responsible for the changes as mentioned above?

Ans. (i) Uterine contractions and retractions are important. Changes are due to the attachment of the longitudinal muscle fibers of the uterus to the circular muscle fibers of the lower uterine segment and upper part of the cervix. Progressive contractions and retractions result in effacement and dilatation of the cervix as the circular muscle fibers are pulled up over the presenting part by the longitudinal muscle fibers.

(ii) Formation of the bag of forewater when the girdle of contact of the fetal head with the lower uterine segment occurs.

(iii) Mechanical stretching of the lower uterine segment and the cervical canal by the presenting part with the pressure of the fetal axis.

Q. What is the clinical significance of lower uterine segment?

Ans. During labor, lower uterine segment forms a complete birth canal when the cervix is fully dilated. The other clinical importances are:

- (a) Implantation of placenta in the lower segment is known as placenta previa.
- (b) Lower segment cesarean section is done here.
- (c) Once placenta is implanted here, the risk of morbid adherent placenta is high.

Q. What is bearing down (pushing effort) during labor?

Ans. It is the additional voluntary expulsive effort of the mother in the second stage of labor. Along with uterine contraction, there is maternal voluntary pushing effort to shorten the duration of second stage of labor.

Q. How do you assess the separation of placenta in the third stage of labor?

Ans. Abdominal examination:

- (a) Uterus becomes globular, firm and ballotable.
- (b) The fundal height is raised.
- (c) There is bulging of the suprapubic region as the placenta occupies the lower uterine segment.

Vaginal examination:

- (a) There is a gush of vaginal bleeding.
- (b) Permanent lengthening of the umbilical cord (there is no indrawing of the cord on suprapubic pressure).

Q. What are the important phases of the second stage of labor?

- Ans.** (i) **Propulsive**—from full dilatation of the cervix to the time when head has reached the pelvic floor.
- (ii) **Expulsive**—since the mother has the irresistible desire of “**bearing down**” or “**pushing down**” till the baby is delivered. Here both the forces of uterine contractions and the voluntary contractions of abdominal muscles are combined.
- (iii) Delivery of the fetus.

Q. What are the important events in the third stage of labor?

- Ans.** (i) Separation of the placenta
- (ii) Expulsion of the placenta.

Q. How is the uterine bleeding controlled after the placenta is normally separated?

- Ans.** (i) The bleeding sinuses are occluded by the interlacing muscle fibers of the uterus as these fibers undergo complete retraction. **These interlacing myometrial fibers act as living ligatures.**
- (ii) Formation of thrombus as there is the hypercoagulable state in pregnancy.
- (iii) Myotamponade action of the uterine walls.

Q. What are the cardinal movements of the fetal head during labor?

- Ans.** The cardinal movements are the series of movements that occur on the head in the process of adaptation during its journey through the pelvis. Cardinal movements, though we consider it separately for our understanding, consists of a combination of movements simultaneously.

These are: (a) **Engagement** → (b) **Descent** → (c) **Flexion** → (d) **Internal rotation** → (e) **Extension** → (f) **Restitution** → (g) **External rotation** and → (h) **Delivery of the shoulder and trunk.**

Q. What is a partograph?

- Ans.** It is a composite graphical record of cervical dilatation and descent of the head and FHR against the duration of labor with time.

Q. How can abdominal examination help to assess the progress of labor?

- Ans.** The amount of fetal head felt suprapubically (in finger breadth) is assessed by placing the fingers above the symphysis pubis. **This is the Crichton fifth formula (“fifths of the fetal head felt above the maternal pubic symphysis”).**

The basovertical (fetal skull) distance is 9–10 cm and the width of the obstetrician's finger is about 1.6–2 cm. With this, **no more than two finger-breadths of fetal skull should be palpable above the symphysis pubis when the lower pole of the fetal skull is at zero station (level of ischial spines)**. If three finger-breadths are palpable above, the fetal head is not engaged. This is true even if a portion of fetal head is palpable below the level of ischial spine (Figs 4.9A and B).

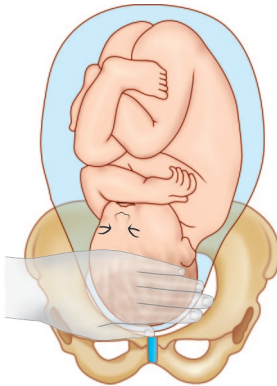


Fig. 4.9A: Head is palpable 5/5th above the symphysis pubis. Head is mobile, free and not engaged

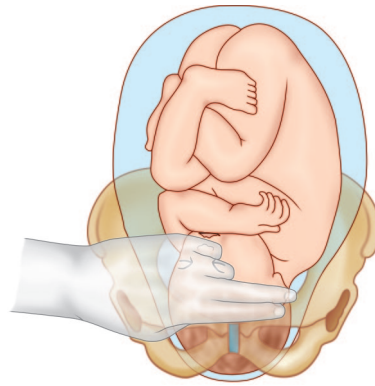


Fig. 4.9B: Head is palpable 2/5th above the brim and the rest 3/5th is gone down the brim. Head is engaged

Q. What is station of the fetal head?

Ans. It is the relationship of the lower pole of the fetal head (presenting part) to that of the plane of the ischial spines. When the lower pole lies at the level of ischial spines, it is known as station zero. The levels above are known as minus (–1 cm, –2 cm, –3 cm, –4 cm and –5 cm) station and the levels below are known as plus (+1 cm, +2 cm, +3 cm, +4 cm and +5 cm) station.

Q. What important information is recorded following an abdominal examination when the woman is in labor?

Ans. (a) **Palpation:** (i) Uterine contractions—frequency (number of contractions in 10 minutes' time), intensity and duration (in seconds); (ii) Pelvic grip—gradual disappearance of poles of the fetal head (sinciput and occiput). Assessment of fetal head above symphysis pubis by Crichton fifth formula (Figs 4.9A and B).
(b) **Auscultation:** Fetal heart rate (FHR)—in beats per minute (bpm). Normal 100–160 bpm, rhythm and intensity.

Q. In the management of first stage of labor, when should vaginal examination be done?

Ans. In the management of labor, vaginal examination should be restricted to a minimum possible extent. The examination is uncomfortable for the woman, but the main risk is the introduction of infection with each examination. However, the common indications of vaginal examination are:

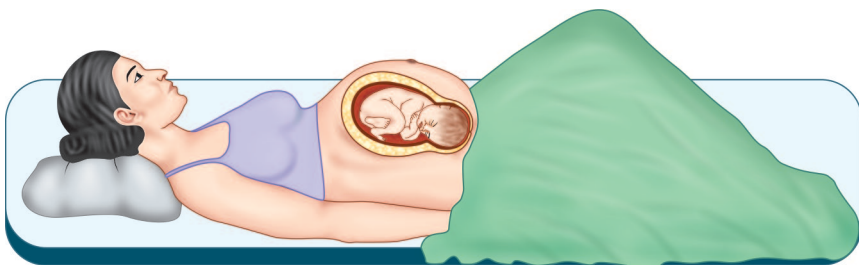


Fig. 4.10: Position of the woman during obstetric examination

1. **At the onset of labor** to detect the cervical changes in association with uterine contractions felt per abdomen. Pelvic assessment, especially in primigravida, is done at the same time.
2. **To assess the progress of labor** by noting cervical dilatation, effacement and descent of the head in relation to ischial spines (station).
3. Once the membrane ruptures, **to exclude cord prolapse**.
4. **To confirm the onset of second stage** when the woman starts bearing down efforts.

Q. What important information is recorded following a vaginal examination when the woman is in labor?

Ans. Vaginal examination is done aseptically with the woman in dorsal position (Fig. 4.10). Gloved middle and index fingers of the right hand are introduced inside the vagina.

The information obtained is as follows:

- (a) Dilation of the cervix (cm)
- (b) Effacement of the cervix (%)
- (c) Position of the presenting part (head)
- (d) Station of the presenting part
- (e) Status of the membranes
- (f) Color of the liquor if the membranes are ruptured
- (g) Caput or molding of the head
- (h) Assessment of the pelvis.

Q. What is asynclitism?

Ans. It is the failure of the sagittal suture of the fetal head to descent with the available (obstetric) transverse diameter of the pelvic inlet.

The sagittal suture may either be deflected anteriorly toward the symphysis pubis or posteriorly toward the sacral promontory. When sagittal suture lies anteriorly, the posterior parietal bone becomes the leading presenting part. **This is known as posterior asynclitism or posterior parietal presentation.** This is observed more in primigravida. In others, the sagittal suture lies more posteriorly when the anterior parietal bone becomes the leading presenting part.

This is known as anterior asynclitism or anterior parietal presentation.

This is common in multipara. Mild degrees of asynclitism are common.

Severe degrees of asynclitism indicate cephalopelvic disproportion.

Presence of molding or caput makes detection of asynclitism difficult. This is important during forceps applications.

Q. When the cervix is considered as fully dilated?

Ans. The measurement of 10 cm is considered the full dilatation. It is approximately the diameter of the fetal head at term.

Q. What is Ritgen maneuver?

Ans. This maneuver is done for controlled delivery of the head in between the uterine contractions. The right hand covered with a sterile towel is placed over the anococcygeal region. The chin is pushed with the fingers of the right hand. The left hand simultaneously exerts counter-pressure on the occiput. The purpose is to deliver the head with its smallest diameters while passing through the introitus and the perineum. This prevents perineal injuries.

Q. What are the clinical features to suggest the onset of second stage of labor?

Ans. (a) Uterine contractions are found with increased intensity and duration.
(b) Appearance of maternal bearing down efforts (pushing efforts).
(c) Urge to defecate with descent of the presenting part.

However, vaginal examination is to be done to confirm the diagnosis.

Q. How do you deliver the fetal head?

Ans.

- Mother is encouraged to push down (bearing down efforts) in the second stage of labor
- Following crowning, with further contractions, perineum is bulged and thinned out. Episiotomy (selective) may be made at this time
- Head is allowed to deliver slowly in between the contractions with the use of **Ritzen maneuver**
- Flexion of the head is maintained during contractions by pushing down the occiput backward using the thumb and the index fingers of the left hand
- Care following delivery of the head: (a) Mucus and blood from the mouth, (b) face and eyes are wiped off by sterile cotton swabs
- Neck is then palpated to exclude any loop of cord and, if found, it may be slipped over the head. When it is found tight, cord is cut in between two clamped Kocher's forceps.

Q. How do you deliver the shoulders and trunk?

Ans. There is no rush to deliver the shoulders. We wait for the next uterine contractions when anterior shoulder is born underneath the symphysis pubis. Anterior shoulder may be released from underneath the pubis by grasping the head with both the palms and gently drawing posteriorly. Similarly, the posterior shoulder is released by drawing the head gently upward. Trunk is delivered by lateral flexion.

Q. *What immediate care of the newborn is done?*

- Ans.** ♦ Baby is placed in a tray covered with dry linen (to keep baby warm) with head slightly downward (15°)
- ♦ Air passage (mouth and oropharynx) is cleared off mucus by gentle suction
 - ♦ Apgar scoring is done at 1 and 5 minutes
 - ♦ Clamping of the umbilical cord is done.

The cord is clamped by two Kocher's forceps. The cord is cut in between. The Kocher's forceps are replaced by cord clamps or cotton cord ligatures. Quick examination of the baby is done to detect any problem or abnormality. Baby is wrapped with a dry warm towel. Identification tag (disc number) is tied on the wrist of both the baby and the mother.

Q. *What is the procedure of cord clamping?*

- Ans.** The cord is clamped by two Kocher's forceps. The near one is placed 5 cm away from the umbilicus and the cord is cut in between. Presence of any abnormality in cord vessels is checked. The Kocher's forceps on the baby's side is replaced by cord clamp (disposable), placed 2.5 cm away from the umbilicus or with two separate cord ligatures of cotton threads.

Delay in cord clamping for 2–3 minutes or till cessation of cord pulsation helps transfer of 80–100 mL of blood from the placenta to the baby. This procedure may not be recommended as a routine due to the risk of polycythemia and hyperbilirubinemia in a normal neonate. **Early cord clamping** is done in cases with—(a) Rh incompatibility, (b) birth asphyxia, (c) preterm baby, or (d) baby of a diabetic mother.

Q. *How do you manage the third stage of labor?*

- Ans.** Third stage is managed either by (i) expectant method or by (ii) active management. Active management of third stage of labor is preferred (see SAQ p. 211).

LABOR-ABNORMAL

MALPOSITION AND MALPRESENTATION

OCCIPUT POSTERIOR POSITION (OP)

Q. What do you understand by occiput posterior position (OP)?

Ans. In vertex presentation, occiput lies posteriorly over the sacroiliac joint or directly over the sacrum.

Q. What are the important factors that favor successful vaginal delivery in a case with OP?

Ans. There are four important issues that often take into consideration. The favorable factors are:

1. Adequacy of the pelvis
2. Good uterine contractions
3. Good flexion of the fetal head
4. Average size of the fetus

Q. How can the outcome of labor be predicted in a case with OP?

Ans. (A) Woman having all the above favorable factors; about 90% have the chance of successful vaginal delivery.

(B) In unfavorable circumstances, the chance of vaginal delivery is less (10%).

Q. What are different outcomes of labor with unfavorable circumstances?

Ans. Depending upon the degree of flexion of the fetal head, uterine contractions, pelvic adequacy and with size of the baby, the occiput may fail to rotate completely anteriorly. This results in any of the following outcomes:

- A. **Incomplete anterior rotation:** It may result in deep transverse arrest.
- B. **Nonrotation:** Oblique occiput posterior position—may result in arrest.
- C. **Malrotation:** Occipitosacral position. In this position, vaginal delivery is possible as **face to pubis**, provided the baby is of average size, there are good uterine contractions and the pelvis is adequate (anthropoid or gynecoid). Otherwise labor process may get arrested as in **occipito-sacral arrest**.

Q. What do you understand by persistent occipitoposterior position?

Ans. Commonly **occiput-sacral position** is described as **persistent occiput posterior position**. However, in a wider sense, keeping in mind the management issues, the other two arrested posterior positions (deep transverse arrest and the oblique posterior arrest) are also included.

Q. Give an outline in the management of a case with occiput posterior position.

Ans. (1) Early diagnosis (2) careful monitoring of labor (A) Early Cesarean delivery: (a) Inadequate pelvis (b) presence of complications. (B) oxytocin augmentation if needed- Anterior rotation -vaginal delivery. (C) Persistent occiput posterior position: (a) Pelvis adequate: Ventouse, or forceps (b) Pelvis Inadequate-CS.

BREECH PRESENTATION

Q. *What are the principal sites where essential movements occur as a part of mechanism of labor in vaginal breech delivery?*

- Ans.** (A) **Buttocks:** Diameter of engagement: Bi-trochanteric (4" or 10 cm).
(B) **Shoulders:** Diameter of engagement: Bisacromial diameter ($4\frac{3}{4}$ " or 12 cm).
(C) **Head:** Diameter of engagement: Suboccipitofrontal (10 cm).

Q. *What is breech extraction and what are the indications?*

Ans. When the fetus is extracted out of the uterus by the obstetrician in a situation of emergency. It is rarely done nowadays.

The indications are:

- (a) Delivery of the second twin after IPV
- (b) Cord prolapse during labor.
- (c) Intrapartum hemorrhage.
- (d) Extended legs arrested at the outlet.

Q. *What are the principles of conduction of vaginal breech delivery?*

- Ans.** (1) Never to rush and not to be hasty in delivery process
(2) Never to pull from below but push from above
(3) To keep the back of the fetus always anterior.

Q. *What are different methods used to deliver the aftercoming head of the fetus in assisting vaginal breech delivery?*

Ans. Delivery of the aftercoming head is a very crucial stage. The procedure whatever used, must be safe, gentle and without any prolongation. The commonly employed methods are (Dutta Obs 8/e, p 444):

- (a) **Malar flexion and shoulder traction** (modified Mauriceau–Smellie–Veit technique)
- (b) **Forceps delivery**
- (c) **Burns-Marshall method**

FACE PRESENTATION

Q. *What is the engaging diameter of the fetal head in face presentation? (Fig. 4.11)*

Ans. It is commonly the submentobregmatic 9.5 cm (fully extended head) or the submentovertical diameter 11.5 cm (partially extended head).

Q. *Could there be any possibility of vaginal delivery in a woman in labor with face presentation of the fetus?*

Ans. Successful vaginal delivery is possible in a case with mento-anterior face presentation rather than mentoposterior one. However, engagement is delayed (Dutta Obs 8/e, p 450).



Fig. 4.11: Vaginal delivery in a case with face presentation. Mentum is seen behind the symphysis pubis. The face appears markedly swollen and congested.

[Courtesy: Dr Subrata Bhattacharya, Silchar]

BROW PRESENTATION

Q. *What is the diameter of engagement of the fetal head in brow presentation?*

Ans. It is the mentovertical diameter (14 cm).

Q. *Could there be any mechanism of labor in brow presentation?*

Ans. There is no diameter in the bony pelvis measuring 14 cm (maximum being 13 cm). As such there is no mechanism of labor unless the fetus is small and true pelvis is roomy with good uterine contractions.

TRANSVERSE LIE

Q. *What is the presentation in a case with transverse lie?*

Ans. Shoulder presentation.

Q. *What is this denominator in shoulder presentation?*

Ans. It is the acromion.

Q. *Give an outline of the clinical course of labor in transverse lie when left uncared for (Fig. 4.12).*

Ans. The major complications are—premature rupture of membranes, unfavorable outcome is common. Rarely the fetus may be delivered as breech or as vertex following spontaneous correction. This is seen when the fetus is small and the labor is early.

Unfavorable outcomes are: PROM - Drainage of liquor, hand prolapse/cord prolapse, Fetal death, Onset of infection, obstructed labor, maternal sepsis, dehydration, ketoacidosis, rupture of uterus, maternal death.

Q. Give an outline of the management protocol in a case with transverse lie.

Ans. 1. External cephalic version is done at or beyond 35 weeks provided there is no contraindication (see p. 214).

2. When version fails or is contraindicated.

(a) Patient is admitted at 37 weeks or earlier and elective cesarean section is the preferred method of delivery.

(b) Vaginal delivery may be allowed in small size fetus, which is congenitally malformed or dead.



Fig. 4.12: Woman in labor with hand prolapse and cord prolapse.
[Courtesy: Dr Subrata Bhattacharya, Silchar]

CORD PROLAPSE

Q. What are the common causes of cord prolapse? (Fig. 4.13)

Ans. (a) Malpresentation (transverse lie)
(b) Contracted pelvis
(c) Prematurity
(d) Twins
(e) Polyhydramnios
(f) Iatrogenic (version, low rupture of the membranes)

Q. What are the complications of cord prolapse?

Ans. A. Fetal: (i) Fetal hypoxia or anoxia due to umbilical cord compression as blood flow are compromised (ii) High perinatal mortality.

B. Maternal risks are due to increase risk of operative delivery (cesarean section), anesthesia, blood loss and infection.

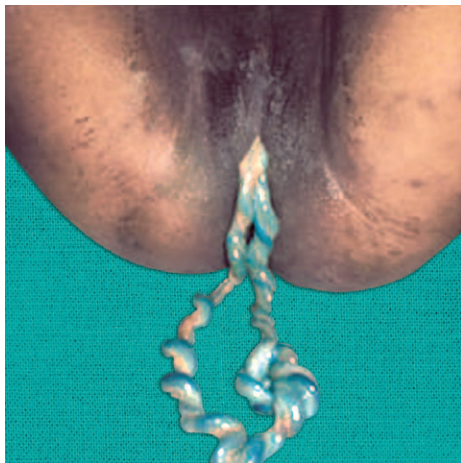


Fig. 4.13: Woman in labor with cord prolapse with true knot.
[Courtesy: Dr Subrata Bhattacharya, Silchar]

Q. *Give an outline of management of a case with cord prolapse.*

Ans. Baby dead: To allow vaginal delivery. Baby living: Caesarean delivery is done when the baby is viable.

COMPOUND PRESENTATION

Q. *What is a compound presentation?*

Ans. When more than one fetal presenting part overlies the lower pole (internal os) of the uterus, it is called compound presentation.

Q. *What are the common varieties of compound presentation?*

Ans.

- Cephalic with hand or foot
- Breech with hand(s)

UNSTABLE LIE

Q. *What is an unstable lie?*

Ans. It is a condition where the presentation of the fetus constantly changes even beyond 36th week of pregnancy when it should have been stabilized.

PROLONGED (PROTRACTED) LABOR

Q. What are the different abnormal labor patterns?

- Ans.** (A) **Prolonged labor:** When total duration of labor (combined duration of 1st stage and 2nd stage) is >20 hours in a primigravida and >14 hours in a multigravida, it is called prolonged labor.
- (B) **Protracted labor (ACOG):** (1) Protracted dilatation—when the rate of cervical dilatation is <1.2 cm/hour in a primigravida and <1.5 cm/hour in a multigravida, (2) protracted descent—when rate of descent of the head <1.0 cm/hour in a primigravida and <2.0 cm/hour in a multigravida.

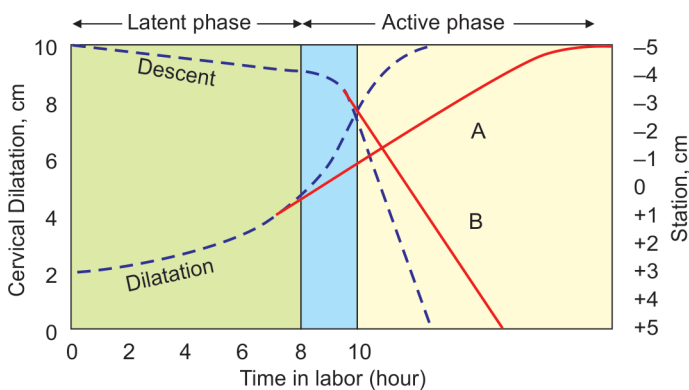


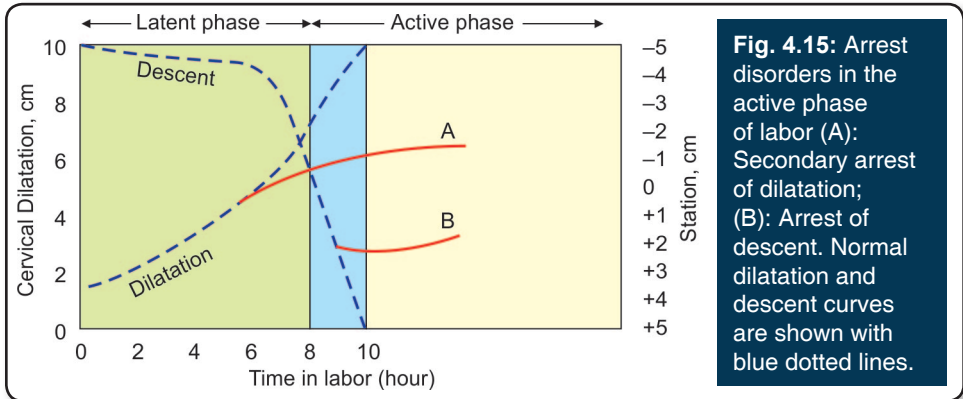
Fig. 4.14:

Protraction disorders in the active phase of labor. (A) Protracted dilatation pattern; (B) Protracted descent pattern. The normal dilatation and descent curves are shown with blue (dotted) lines

- (C) **Arrest disorder** in labor (ACOG): (1) Secondary arrest of dilation—when there is no dilation of the cervix for a period >2 hours in a woman who had normal cervical dilatation after entering the active phase of labor. This is applicable irrespective of a primigravida or a multigravida, (2) Arrest of descent is when there is no descent of the presenting part for a period of >1 hour irrespective of primigravida or multigravida).

Q. What are the different types of dysfunctional labor?

- Ans.** (a) **Primary dysfunctional labor:** When the dysfunctional labor pattern starts following a normal latent phase. This is the commonest abnormal labor pattern. Augmentation of labor is done to correct it.
- (b) **Secondary dysfunctional or arrest of labor:** When the active phase of labor commences normally, but stops or slows down significantly before the full dilation of the cervix. When this type of labor pattern is seen in a multigravida, the risk of rupture uterus is high.



Q. What are the etiology and management of the protracted active phase of labor?

- Ans.** It may be due to inadequate uterine contractions. In such a situation, oxytocin augmentation of labor is successful. Otherwise, if it is due to cephalopelvic disproportion (CPD), cesarean delivery should be done.

Q. What are the etiology and management of arrest disorder of labor?

- Ans.** In the active phase, management depends on its etiology. Oxytocin augmentation is successful when it is due to inadequate uterine contractions. Cesarean section is indicated when it is due to fetal malpresentations, malpositions, cephalopelvic disproportion or asynclitism.

OBSTRUCTED LABOR

Q. *What is obstructed labor?*

Ans. When there is arrest in the descent of the presenting part (for a period of ≥ 1 hour), due to some mechanical obstruction, in spite of good uterine contractions.

Q. *What are the common causes of obstructed labor?*

Ans. (a) Contracted pelvis and cephalopelvic disproportion.
(b) Abnormal presentations or positions, like transverse lie, brow presentation, occiput posterior position.
(c) Fetal malformations—hydrocephalus.

Q. *What are the effects of obstructed labor on the mother?*

Ans. A. Immediate complications:

- (a) Dehydration
- (b) Metabolic ketoacidosis
- (c) Genital tract sepsis
- (d) Rupture of the uterus
- (e) Postpartum hemorrhage
- (f) Maternal death

B. Late complications:

- (a) Genital tract fistula
 - Vesicovaginal
 - Rectovaginal

Q. *What are the effects on the fetus?*

Ans. (a) Asphyxia, (b) acidosis, (c) intracranial hemorrhage, (d) infection, and (e) increased perinatal morbidity and mortality (f) fetal death.

Q. *Outline the management issues in a case with obstructed labor?*

Ans. (1) **Prevention:** Partograph management of labor and timely intervention can prevent it.

(2) **Actual management:**

- A. Resuscitation of the patient
 - a. Correction of dehydration, IV infusion of crystalloids (Ringer's solution).
 - b. Correction of electrolyte imbalance.
 - c. Control of sepsis (antibiotic therapy): parenteral route (IV).
 - d. Blood sample to send for grouping and cross matching.

(3) **Obstetric management**

- a. Cesarean delivery when the fetal condition is good.
- b. When vaginal delivery is possible: Patient may be delivered by forceps or craniotomy (destructive operation) in a case with dead fetus.
- c. Symphysiotomy as an alternative may be done.

CHAPTER

5

Active Management of Labor

Chapter Objectives

Knowledge and understanding of:

- Labor monitoring and fetal surveillance
- Normal and abnormal labor
- Data interpretation
- Clinical judgment and management issues

- **Labor Monitoring—Partography**
- **Electronic Fetal Monitoring—Cardiotocography**

LABOR MONITORING-PARTOGRAPHY

Q. What is active management of labor ?

Ans. It is the management of labor with active involvement of the consultant obstetrician. It has many components of which Partography for assessment of labor progress and cardiotocography for fetal monitoring are important. AMOL has many advantages.

Q. What is a partograph ?

Ans. It is a composite graphical record of key data (cervical dilatation, descent of fetal head and FHR) against duration of labor in hours.

Q. How a cervicograph is plotted ?

Ans. In cervicograph (Philpot and Castle – 1972), the **alert line** starts at 3 cm (WHO–4 cm) of cervical dilatation and ends at 10 cm (at the rate of 1 cm per hour). The **action line** is drawn 2–3 hours (WHO – 4 hours) to the right and parallel to the alert line.

Q. What is the plotting of a cervicograph in a normal labor ?

Ans. In a normal labor, the cervical dilatation (cervicograph) lies either on the alert line or to the left of it (Zone – 1).

Q. What is the importance of alert and action lines ?

Ans. When the cervicograph crosses the alert line (Zone-2) it is abnormal. Patient needs to be critically assessed.

When it crosses the action line (Zone – 3), patient should be reassessed by a senior person. Decision is to be made either for delivery (cesarean section) or augmentation depending upon the abnormality detected.

Q. What are the advantages of partographic management of labor ?

Ans.

- (a) Early detection of dysfunctional labor
- (b) Reduction in the complications of labor dysfunction
- (c) Reduction in duration of labor (12 hours)
- (d) Early detection of fetal hypoxia
- (e) Reduction in the incidence of cesarean section
- (f) Less need of analgesia
- (g) Maternal anxiety is less due to support of the caregiver
- (h) While working in the peripheral center, timely transfer of the mother could be done, once the diagnosis of dysfunctional labor is made.

Q. What are the names associated with graphic analysis of labor (partograph)?

Ans.

- (a) Friedman Emanuel 1954: Cervical dilatation and descent of fetal head.
- (b) Philpott and Castle 1972: Cervical graph with alert and action lines.
- (c) Studd and Duignan 1972: Nomogram, to assess mean cervical dilatation.

Q. What are the components of a partograph ?

- Ans.**
- A. **Patient information:** Name, age, gravida, parity, hospital number, time of admission, time of rupture of membranes.
 - B. **Fetal heart rate:** Recorded every half an hour.
 - C. **Status of membranes and color of liquor.**
 - I :** Membranes intact
 - R :** Membranes ruptured
 - C :** Membranes ruptured: liquor clear
 - M :** Liquor : meconium stained
 - B :** Liquor : blood stained.
 - D. **Cervical dilatation** expressed in cm. Alert and action lines are drawn (p. 196).
 - E. **Descent of fetal head:** Assessed by abdominal examination (p. 180, Figs 4.9A and B) or by vaginal examination in relation to station.
 - F. **Hours** is the time elapsed since the onset of active phase of labor.
Time is the actual time of examination (see partograph on p. 196).
 - G. **Uterine contractions:** Number of contractions in 10 minute time period and their duration in seconds. They are shaded accordingly (see p. 198).
 - H. **Drugs and fluids:** To record oxytocin — in mIU/minute to escalate every 30 minute. Drugs are recorded when given.
 - I. **Pulse and blood pressure:** pulse—to record every 30 minute and is marked with a dot (•), BP is measured in every 4 hours and is marked with arrows (b).
 - J. **Temperature:** To record every 2 hours.
 - K. **Urine:** To record for volume, protein and acetone when passed (usually 2–3 hours).

THE SIMPLIFIED PARTOGRAPH (GOVERNMENT OF INDIA)

Government of India (GOI) is committed to meet the MDG 5 targets (see p. 297) of less than 100 maternal deaths per 100,000 live births by the year 2015. National population policy (NPP) with its wings of National Rural Health Mission (NRHM) and Reproductive and Child Health (RCH-II) program ensures universal coverage of all births with skilled attendance both in the institution and at the community level. This also ensures emergency obstetric and neonatal care services for women and newborn.

With this initiative, **partographic recording** of the progress of labor has been introduced. Skilled attendance at birth (p. 298) and partographic labor recording facilitates timely referral and safe delivery.

Evidence-based practices have demonstrated that presence of skilled birth attendant (SBA) can effectively reduce maternal mortality (p. 300). SBAs are to work at the outreach centers, subcenters (SCs), primary health centers (PHCs) and first referral units (FRUs).

PARTOGRAPH FOR NORMAL LABOR

Case Summary

Mrs KN 23 years old, G-2, P-1, L-1 (P1+0+0+1) was admitted at 6 am on 13-10-2010 with labor pain following a term pregnancy. Her first pregnancy ended in spontaneous vaginal delivery. She had spontaneous rupture of membranes 1 hour prior to her admission. On examination she was normotensive, uterine contractions were mild to moderate (2-3 per 10 minutes) and FHS was 130 bpm and regular. Pelvic examination revealed: cervix 60% effaced; os: 2 cm, membranes absent and liquor—clear. Her partograph is shown in the Fig. 5.2: Partograph 2.

Q. What was the cervical dilatation at 8 am ?

Ans. Cervix became 4 cm dilated.

Q. How long she took to enter into the active phase of labor ?

Ans. During admission at 6 am, she was 2 cm dilated and by 8 am she became 4 cm. It is by 2 hours since admission that she entered the active phase of labor.

Q. What should be the normal rate of cervical dilatation for her ?

Ans. As she is P1 + 0 + 0 + 1, her cervical dilatation should ideally be 1.5 cm/hour.

Q. At what time she became fully dilated ?

Ans. At 12.00 hours (6 hours since admission) she became fully dilated.

Q. What was the duration of the active phase of labor ?

Ans. 4 hours.

Q. How were the uterine contractions during the course of labor ?

Ans. During the first hour, contractions were mild each lasting < 20 seconds for the next 2 hours the frequency of uterine contractions were 3-4/10 minutes and each lasted about 20-40 seconds. In the last one hour contractions were really strong. Number of contractions increased to 4-5 and each lasted for \geq 40 seconds.

Q. How was the fetal heart rate during the course of labor ?

Ans. During the entire course of labor, the FHR varied from 120-150 bpm. There was no bradycardia or tachycardia or any irregularity.

Q. How was the blood pressure of the woman during the course of labor ?

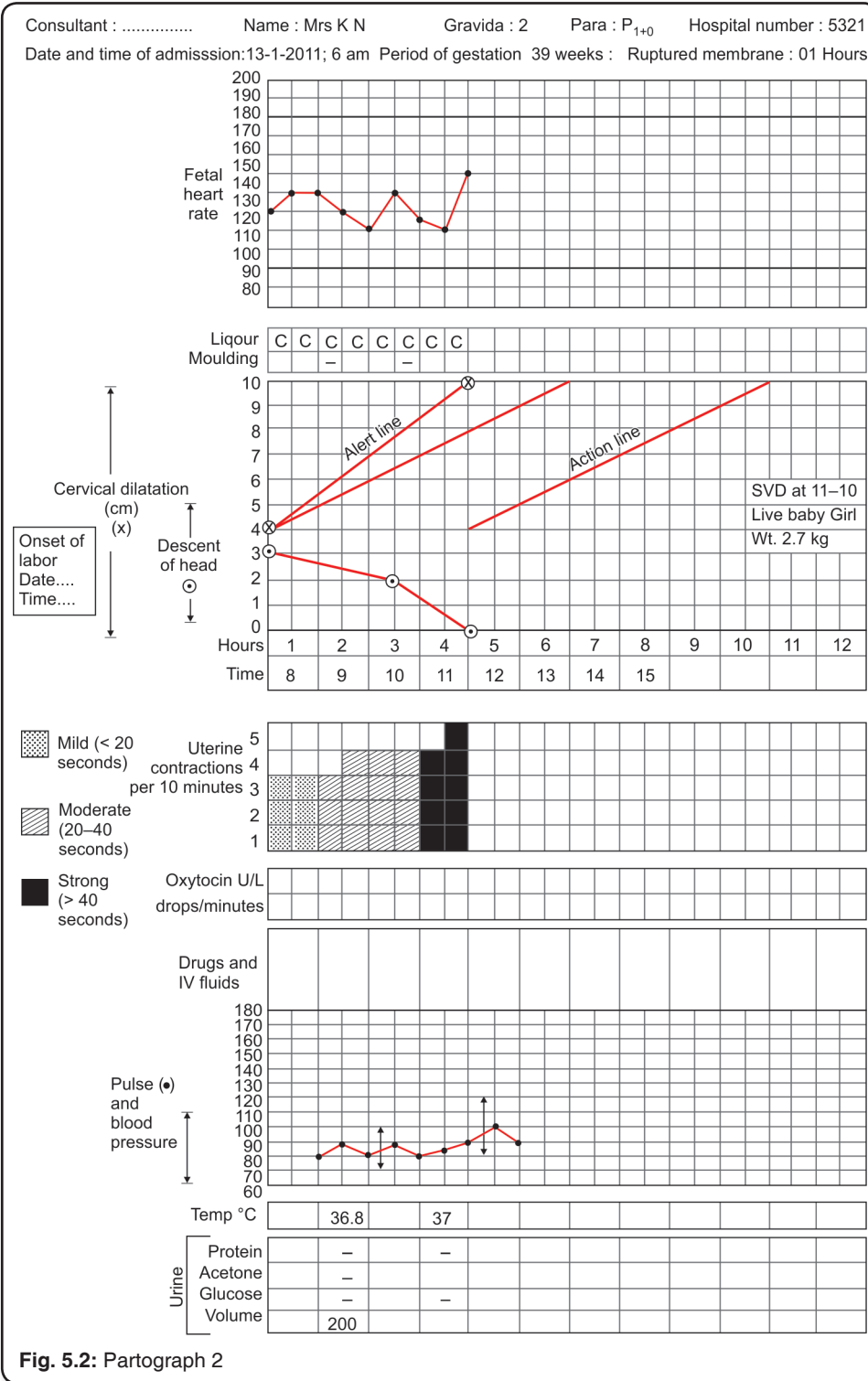
Ans. BP remained between 110/70 mm Hg and 120/80 mmHg.

Q. Did Mrs KN require any augmentation of labor ?

Ans. No. She progressed normally. There was no need of augmentation for her.

Q. What was the level of fetal head when she was admitted ?

Ans. Head was 3/5th palpable above the brim (Crichton's method). Head was not engaged at the time of admission.



Mild (< 20 seconds)

Uterine contractions per 10 minutes

5

4

3

2

1

Moderate (20-40 seconds)

Strong (> 40 seconds)

5

4

3

2

1

0

1

2

3

4

5

Oxytocin U/L drops/minutes

5

4

3

2

1

0

Drugs and IV fluids

180

170

160

150

140

130

120

110

100

90

80

70

60

Pulse (●) and blood pressure

180

170

160

150

140

130

120

110

100

90

80

70

60

Temp °C

36.8

37

Urine

Protein

Acetone

Glucose

Volume

—

—

—

200

Fig. 5.2: Partograph 2

PARTOGRAPH AND ABNORMAL LABOR

Case Summary

Mrs CL, 31 years old, G5P3, A1, L3(P3+0+1+3) was admitted in labor following a term pregnancy. Her partograph is shown in Fig. 5.3: Partograph 3.

Q. Discuss the partographic observation of Mrs CL during admission at 8 am.

Ans. Mrs CL had :

- (1) Cervical dilatation : 4 cm
- (2) Fetal head : 3/5th palpable above the brim (not engaged)
- (3) Uterine contraction : mild, each lasting for < 20 seconds
- (4) FHR : between 130 and 140 bpm, regular
- (5) Liquor : clear
- (6) Blood pressure : 130/80 mmHg.

Mrs CL was in active phase of labor.

Q. Discuss her labor progress observed after 4 hours of labor (12.00 hours).

- Ans.**
- (1) Cervical dilatation : 6 cm dilated. But it has crossed the alert line.
 - (2) Fetal head : 3/5th brim, no descent of head since admission.
 - (3) Uterine contractions : 3/4 in 10 minutes time, each lasting for > 40 seconds.
 - (4) FHR : > 160 bpm (tachycardia) but coming down steeply upto 100 bpm (bradycardia) by the next hour.
 - (5) Liquor : Clear.
 - (6) Moulding : 2+.

Comments: Cervical dilatation increased by 2 cm over a period of 4 hours. For Mrs CL it was much less (normally 1.5/hour). Cervicograph is on the right side of the alert line. There is no change in the descent of the presenting part in spite of the fact that uterine contractions were adequate. Presence of tachycardia and bradycardia with moulding indicate adverse fetal response in relation to the progress of labor.

Ringer's solution was started to maintain her hydration and normal metabolic status.

Q. Discuss the partograph as recorded during the course of Mrs CL's labor at 14.00 (2 pm).

- Ans.**
- (1) Cervical dilatation : 6 cm. It has touched the action line
 - (2) Fetal head : 3/5th above the brim. No descent at all.
 - (3) Uterine contraction : 3-4 in 10 minutes time each lasting \geq 40 seconds.
 - (4) FHR : Significant bradycardia < 110 bpm.
 - (5) Liquor : Meconium stained.
 - (6) Moulding : 3+.

Comments: Mrs CL had no further dilatation of the cervix since the last observation at 12 pm (2 hours) and there is not any descent of the presenting part. Fetal bradycardia, moulding of the head, meconium-stained liquor were observed. Partographic analysis of labor revealed arrest of dilatation and descent, in the active phase of labor despite adequate uterine contractions. This indicates labor is obstructed. This observation along with presence of fetal distress, labor was terminated. Cesarean delivery was performed at 2-10 pm.

Q. How can you evaluate critically that partograph can reduce the problems of prolonged and obstructed labor ?

Ans. SAQ p 216.

Consultant : Name : Mrs CL Gravida : 5 Para : 3+1 Hospital number : 7357
Date and time of admission:13-9-2010; 8 am Period of gestation 39 weeks : Ruptured membrane : 01 Hours

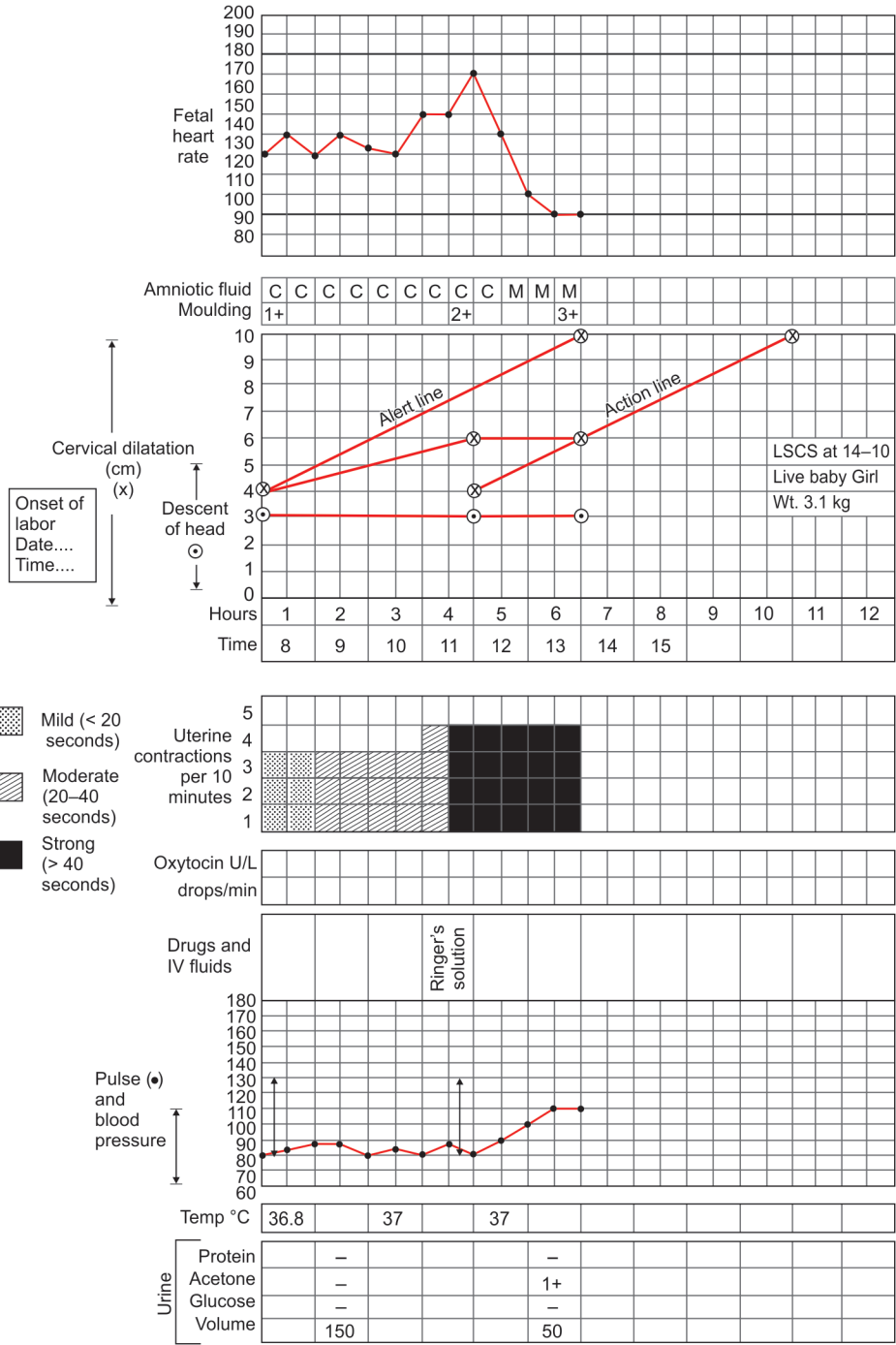


Fig. 5.3: Partograph 3

THE SIMPLIFIED PARTOGRAPH GOVERNMENT OF INDIA

Skilled birth attendants (SBAs) are trained to diagnose women in labor. They are skilled to differentiate true labor pain from false labor pains. They all have the knowledge and skill to manage the different phases of labor (latent and active), stages of labor, monitoring of uterine contractions, cervical dilatation, FHR and maternal vitals at frequent intervals.

Plotting of partograph: It is started when the cervical dilatation is 4 cm or more (similar to WHO, see p 196) when the active labor starts.

- ♦ The first recording is plotted on the alert line.
- ♦ The rest of the procedures are similar to that of WHO (see p 198).
- ♦ Next plotting is done after 4 hours following another vaginal examination.
- ♦ When the labor plotting remains on the left of the alert line progress is considered satisfactory.
- ♦ When the alert line is crossed (the labor plotting moves on the right of the alert line), labor is considered abnormal (labor is prolonged or obstructed).
- ♦ In this case woman needs to be referred urgently to the FRU. The partograph should also be sent along with the woman.
 - Crossing the action line (labor plotting on the right of the action line) indicates need for intervention. Therefore, by the time the action line is crossed, the woman should reach the FRU for necessary intervention.
 - The difference between the alert line and the action line is 4 hours.
 - So SBA is alerted once alert line is crossed. SBA should refer the woman soon and should not wait till the action line crossed.
 - Other procedures (recording of uterine contractions, maternal vitals, FHR, liquor) are same as that of WHO (see p 196).

SIMPLIFIED PARTOGRAPH

Case Summary

Mrs Bani Pillai, a 26 years old primigravida was admitted in labor following a term pregnancy. Her partograph is shown in Fig. 5.4.

Q. Discuss the partographic observation of Mrs Bani at 10 am (see p 202).

Ans. • Cervix was 4 cm dilated, • uterine contractions were 2 in 10 minutes and each lasted less than 20 seconds, • FHR was 140/minute, • blood pressure was 100/70 mm Hg, • temperature was 37°C and • Pulse was 80/minute.

Q. Discuss her partographic observation at 2 pm.

Ans. • Cervix was 6 cm dilated, • liquor was meconium-stained, • uterine contractions were 4 in 10 minutes and each lasted for 45 seconds, • FHR was 170/minute, • pulse was 100/minute, temperature was 37.6°C and blood pressure was 140/90 mmHg.

Q. Why she was referred ?

Ans. Labor was monitored by an ANM at a peripheral center. Labor plotting had moved on the right of the alert line. Labor is prolonged, liquor was meconium- stained, FHR was 170/minute. BP was 140/90 mmHg. She needed intervention. Therefore, she was referred to the nearby FRU where she reached by 30 minutes.

Identification data

Name: Mrs. Bani Pillai **W/o:** Ramaraju **Age:** 26 years **Parity:** Primigravida **Reg. No.:** 23780

Date and time of admission **Date and time of ROM:**
11th march 2011, 10 am 11th march 2011, 10 am

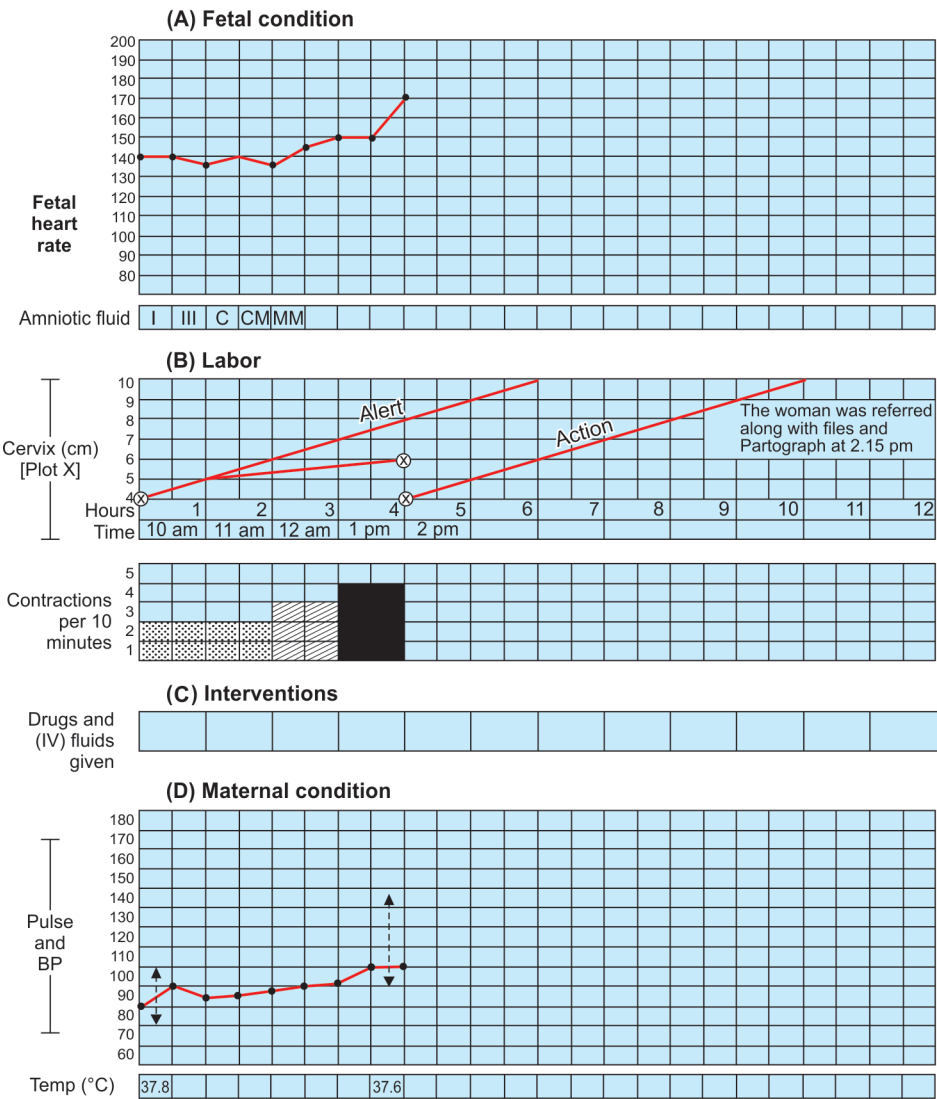


Fig. 5.4: Partograph 4

ELECTRONIC FETAL MONITORING



Fig. 5.5: Cardiotocography is in progress using abdominal transducers

A : Abdominal transducers (external monitoring)

B : Abdominal belt to keep transducers in position

C : CTG machine; FHR tracing is being recorded

Q. What do you understand by intrapartum fetal monitoring ?

Ans. It simply means to watch the fetal behavior during the course of labor.

Q. Is there any additional stress to the fetus even during the course of a normal labor ?

Ans. Yes. During the course of labor there are certain changes that put the fetus under stress even in a normal labor. There are:

- (a) During uterine contractions, there is curtailing of uteroplacental circulation—so the fetus may develop hypoxia.
- (b) Head compression during labor may affect the vital centers of the fetal brain.

However, in a compromised fetus and/or in an abnormal labor, fetal distress may appear more frequently compared to a normal labor.

Q. What are the different methods of intrapartum fetal monitoring ?

Ans. (1) Clinical, (2) Biophysical and (3) Biochemical.

Q. What are the advantages of CTG over clinical monitoring ?

- Ans.**
- (i) Early detection of fetal hypoxia
 - (ii) Improvement of intrapartum fetal death
 - (iii) Improvement of perinatal mortality
 - (iv) Important document for medicolegal purpose.

Q. What are the drawbacks of CTG ?

- Ans.**
- (i) Instruments are expensive
 - (ii) Trained personnel are needed to interpret a trace
 - (iii) Due to false prediction cesarean delivery rate may go high.

Q. What is a nonstress test (NST) ?

Ans. It is an antenatal observation. It is the association of FHR acceleration with fetal movements. When present, it indicates a healthy fetus. This is reliable screening test.

Q. What are the causes of fetal tachycardia (FHR > 160 bpm) ?

Ans. see Table 5.1.

Q. What are the causes of fetal bradycardia (FHR < 100 bpm) ?

Ans. see Table 5.1.

Table 5.1: Causes of fetal bradycardia

| Causes of fetal tachycardia (FHR > 160 bpm) | Causes of fetal bradycardia (FHR < 110 bpm) |
|---|--|
| (a) Drugs to mother : (i) Beta-sympathomimetic agents used to inhibit preterm labor (isoxsuprine, ritodrine), (ii) vagolytic : atropine | (a) Fetal hypoxia and acidosis |
| (b) Infection — both maternal and fetal | (b) Fetal sepsis and anomalies |
| (c) Anemia — both maternal and fetal | (c) Use of local anesthetic drugs and epidural analgesia |
| (d) Fetal hypoxia | (d) Drugs to mother, e.g. pethidine, antihypertensives (methyldopa, propranolol) and MgSO ₄ |
| | (e) Fetal heart conduction defect (SLE) |

Q. Mention the criteria of a reassuring (reactive) trace ?

- Ans.** ♦ Baseline FHR between 100 and 160 bpm
- ♦ Baseline variability > 5 bpm
 - ♦ Two accelerations in 20 minutes observation
 - ♦ No deceleration or may be an early deceleration

Q. When a CTG trace pattern is called abnormal ?

- Ans.** Abnormal trace pattern (pathological) includes:
- ♦ **Baseline FHR:** < 100 bpm or > 180 bpm.
 - ♦ **Baseline variability:** < 5 bpm for > 90 minutes or sinusoidal pattern.
 - ♦ **Acceleration:** None in 40 minutes observation.
 - ♦ **Deceleration:** Late deceleration > 30 minutes or single prolonged deceleration > 3 minutes or atypical variable decelerations.
 - ♦ **Sinusoidal pattern.**

Q. What are the reasons for decreased baseline variability ?

- Ans.** ♦ Fetal sleep
- ♦ Infection
 - ♦ Maternal medications (pethidine, propranolol, MgSO₄)
 - ♦ Fetal hypoxia
 - ♦ Fetal heart conduction defect (SLE)

Q. What are the indications of continuous electronic monitoring of the fetus?

- Ans.** When the risks intrapartum fetal hypoxia is high, continuous electronic fetal monitoring is suggested.

The conditions are:

- ♦ IUGR
- ♦ Meconium-stained liquor
- ♦ Maternal hypertension/diabetes
- ♦ Previous cesarean delivery
- ♦ Malposition (OP) or presentation (breech)

INTERPRETATION OF A CARDIOTOCOGRAPH**Q. What is baseline FHR ?**

- Ans.** It is the mean level of FHR between the peaks and depressions. It is expressed as beats per minute (bpm).

Q. What is the baseline variability ?

- Ans.** It is the oscillation of baseline FHR excluding the accelerations and decelerations. A baseline variability of 10–25 bpm is a sign of fetal well-being.

Q. What is an acceleration ?

- Ans.** Acceleration is the increase in FHR by 15 bpm or more lasting for at least 15 seconds.

Q. What does an acceleration signify ?

Ans. Acceleration denotes a healthy fetus.

Q. What is a deceleration ?

Ans. It is the decrease in FHR below the baseline by 15 bpm or more.

Q. What are the different types of decelerations ? What is the significance of each type ?

Ans. A. Early deceleration: It is due to head compression (Type I dips).

B. Late deceleration: Indicates uteroplacental insufficiency and fetal hypoxia (Type II dips).

C. Variable deceleration: It may be due to cord compression.

Q. What is a reassuring (reactive) CTG ?

Ans. Presence of ≥ 2 acceleration of ≥ 15 bpm above the baseline and lasting for ≥ 15 seconds, in a 20 minutes observation is a reassuring pattern.

Q. What features in a CTG are suggestive of a healthy fetus ?

Ans. Presence of accelerations and a normal baseline variability (10–25 bpm) denote a healthy fetus.

ELECTRONIC FETAL MONITORING - CARDIOTOCOGRAPHY

Case Summary

Mrs SL 26 years old school teacher, presents in her first pregnancy at 36 completed weeks of gestation with diminished fetal movements. She was normotensive and without any obstetric and medical complications of pregnancy. Cardiotocograph was done and is shown in Fig. 5.6 : Cardiotocograph-1.

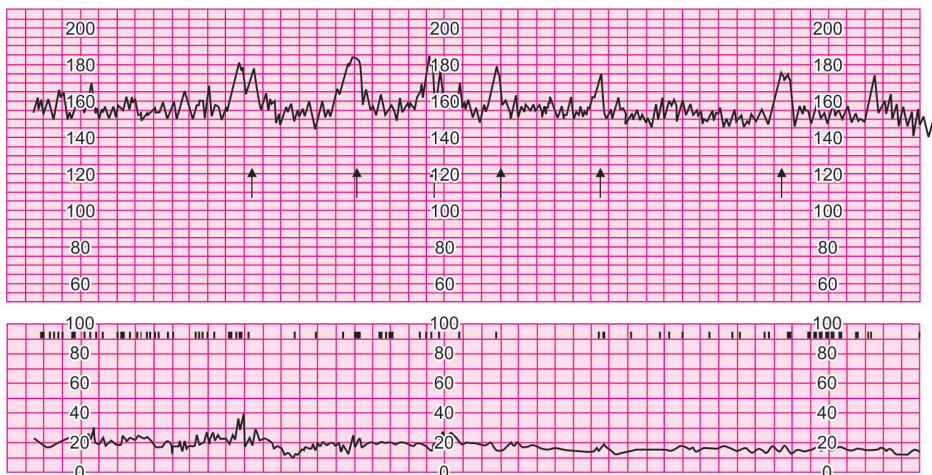


Fig. 5.6: Cardiotocograph – 1 : CTG trace of Mrs SL Fetal movements (black blocks) with cardiac accelerations are seen

Q. What is the baseline FHR for Mrs SL?

Ans. 150 beats/minute (bpm).

Q. What is the baseline variability ?

Ans. 10–20 bpm.

Q. Is there any sinusoidal pattern ?

Ans. Nil

Q. How many acceleration are there in the trace ?

Ans. Six within the period of 20 minutes.

Q. Is there any deceleration ?

Ans. Nil.

Q. What about the nonstress test ?

Ans. Fetal movements are evidenced by black-blocks in the graph. Simultaneous with the fetal movements there is acceleration of FHR.

Q. How do you categorize this CTG trace ?

Ans. All the four features are normal (reassuring). It is a normal trace indicating a healthy fetus.

Q. What about the tocograph in the trace ?

Ans. Tocograph showed absence of uterine contractions.

Case Summary

Mrs ZC, 26 years old house-wife, $P^{0+0+0+0}$ was admitted at 35.4 weeks of gestation because she was epileptic and the baby was small for gestation. A 30 minutes cardiotocography (CTG) trace was done when she complained of diminished fetal movements. The CTG trace is shown in the Fig. 5.7.

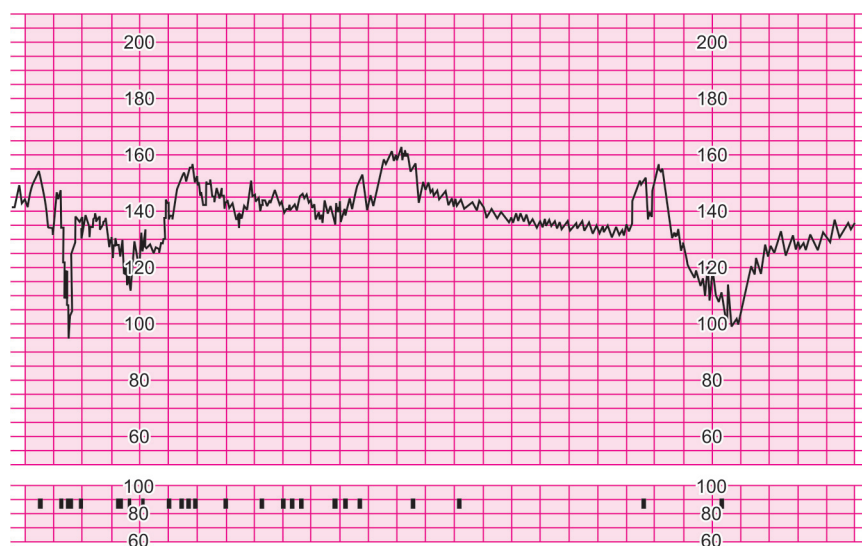


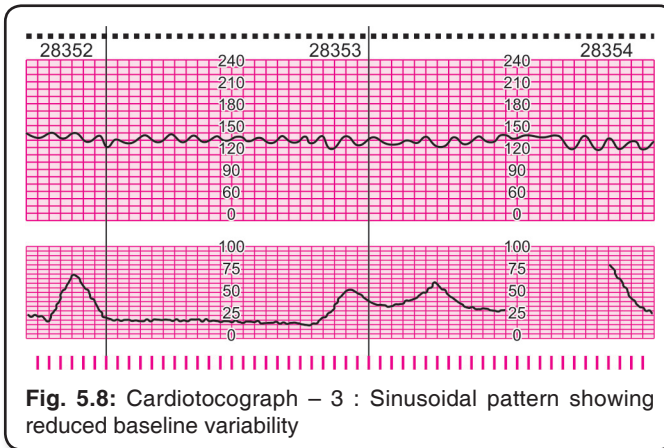
Fig. 5.7: Cardiotocograph – 2 : Abnormal non-stress test showing repeated decelerations 40 bpm and lasting > 3 min.

Q. What abnormalities are shown in the trace ?

Ans. Baseline fetal heart rate was 140 bpm with unprovoked repeated decelerations (20–40 bpm) lasting for more than 3 minutes

Q. What would be the next plan of management ?

Ans. Patient should be admitted for continuous monitoring and for biophysical scoring. Further CTG showed the trace as below (Fig. 5.8).



Q. What abnormalities are shown in the trace. This trace pattern remained persistent.

Ans. Sinusoidal pattern
Fetal baseline heart rate is 135 bpm
Baseline variability is ≤ 5 bpm
Acceleration : Nil

Q. What would be your advice ?

Ans. This trace is pathological. Fetus needs to be evaluated with biophysical profile including Doppler study of umbilical vessels, ductus venosus and middle cerebral artery.

Q. Both the parameters revealed the fetus is hypoxic. What would be your advice ?

Ans. ♦ To organize delivery.
♦ On examination cervix was found unfavorable. She was delivered by LSCS. The baby weighed is 1.2 kg.

CHAPTER

6

Obstetrics Short Questions

Chapter Objectives

Short Questions:

Model answers are provided to develop the art of writing in a concise way with important and updated information. Discussion need to be focused.

Q. 1**Magnesium sulphate is the drug of choice in the management of eclampsia—Justify**

Ans. Eclampsia is the leading cause of maternal death in India. Magnesium sulfate is used in severe pre-eclampsia **to prevent seizures (prophylactic use)**. It is used in eclampsia **to control seizures as well as to prevent its recurrence**. Other drugs occasionally used in the management of eclampsia are Lytic cocktail (Menon's regimen). Diazepam therapy (Lean's regimen) and phenytoin therapy. These drugs have got no prophylactic value. Moreover, compared to these drugs magnesium sulfate has got the superiority in the following areas:

- a. It is given either by IM (pritchard) or by IV regimen (zuspan)—it is relatively simple to administer.
- b. In majority of cases—clinical monitoring is sufficient enough to continue the drug. Clinical monitoring parameters are: (i) Presence of knee jerks, (ii) urine output is > 30 mL/hour and is (iii) respiratory rate 12/minute. Rarely serum magnesium level estimation is needed. (Normal therapeutic level is 4–7 mEq/l).
- c. Compared to other drugs it **prevents seizures more effectively and prevent its recurrence**.
- d. It acts by reducing motor end plate sensitivity to acetylcholine and it blocks neuronal calcium influx. It induces **dilatation of cerebral and uterine vessels** which is distinctly beneficial. Moreover **it does not alter maternal sensorium**. This is a major advantage over other drugs.
- e. It has excellent results with significantly **reduced maternal mortality (3%) and morbidity**.
- f. Compared to other drugs, it has **no detrimental effect on the fetus or the neonate**. This is a major advantage over the other drugs.
- g. **Side effects** (muscular paresis, respiratory failure) **are rare** once drug dose is monitored clinically and carefully. However, 10% calcium gluconate, 10 mL IV slowly, is a effective antidote.
- h. Compared to other drugs, perinatal mortality is also very low with MgSO_4 . The **other drugs have got significant fetal and neonatal depression effect**.
- i. Considering all these benefits over the other drugs, magnesium sulfate is considered the drug of choice in eclampsia.

(For further details: see p. 283 (Drugs in Obstetrics))

Q. 2**Active management of third stage of labor (AMTSL) should be done in all cases—Justify**

Ans. The third stage is the most crucial stage of labor. Unless managed properly it can lead to the following **complications** like: (i) Postpartum hemorrhage, (ii) Shock, (iii) uterine inversion, (iv) retention of placenta, (v) pulmonary embolism and (vi) maternal death. Previous uneventful first and second stage may become abnormal in the third stage and may lead to maternal death. To prevent such complications active management of third stage of labor is helpful.

Procedure: Injection oxytocin 10 IU IV (slowly)/IM or Injection methergin 0.2 mg IV (slowly) is given to the mother within one minute following birth of the baby. Injection oxytocin is preferred as it has less side effects compared to methergin (nausea, vomiting and rise in BP).

The **principles** of active management of third stage of labor are:

- (i) To stimulate powerful uterine contractions following birth of the baby by giving **parenteral (IM/IV) oxytocin**.
- (ii) To facilitate the **early separation of placenta**.
- (iii) To excite **uterine contractions (massaging the uterus)** to expedite the delivery of the placenta by controlled cord traction.
- (iv) To **prevent** postpartum hemorrhage.

The significant **advantages** of active management of third stage of labor are:

- (i) Third stage blood loss is reduced approximately to one-fifth (ii) Duration of third stage is reduced to its half. However timing of injection is important. Active management therefore needs more trained nursing personnel in the labor ward to give the injection in time. Besides the normal cases, this management certainly valuable in cases that are likely to develop postpartum hemorrhage (anemia, hydramnios, twins, grand multiparity, previous history of PPH and delivery under anesthesia). There are **few contraindications** of this management specially for methergin. These cases are women with heart disease, severe pre-eclampsia and in cases with twins until the 2nd baby is born. However, Injection oxytocin is safe in such cases compared to methergin. Considering all the benefits, active management should be done in almost all cases in the third stage of labor.

Q. 3 Maternal mortality is mostly avoidable—Comment

Ans. Maternal mortality ratio (MMR) in India is high (167/100,000 live births—SRS '11-'13). In India life time risk of dying for a woman during pregnancy is 1 in 70 compared to one in 48,000 in developed countries. The **direct causes** of maternal deaths are due to hemorrhage (20–25%), infection (15–20%), hypertension during pregnancy (15–20%), unsafe abortion (10–13%), and obstructed labor (8%). The important **indirect causes** of deaths are anemia (15–20%), viral hepatitis and heart disease. (p. 293).

The **factors associated** with high maternal mortality are advanced women's age, high parity and poor antenatal care. The **important social factors** associated are illiteracy, ignorance, unregulated fertility, poor socioeconomic condition, under utilization of existing health care services and lack of communication and referral facilities.

The **important steps** to reduce maternal mortality are:

- Utilization of basic antenatal, intranatal and postnatal care.
- Presence of skilled birth attendant.
- Availability of emergency obstetric care, safe abortion services and family planning services.
- Improvement of legislative and policy action to remove social inequalities on grounds of gender.

Moreover there are certain proven interventions to reduce maternal deaths. These are:

- a. **Hemorrhage** (APH, PPH, abortion, ectopic pregnancy): Proven interventions are to correct anemia, skilled attendant at birth, prevention and treatment of hemorrhage, use of oxytocics in time, to replace the blood loss by transfusion when indicated.
- b. **Infection** (labor and puerperium): Clean delivery practices, skilled birth attendant, use of antibiotics—when infection is evident.
- c. **Hypertension** (pre-eclampsia, eclampsia): Early detection, antiseizure prophylaxis (MgSO_4) and appropriate referral.
- d. **Unsafe abortion**: Safe abortion services, use of antibiotics.
- e. **Obstructed labor**: Use of partograph, and timely intervention or referral.
- f. **Anemia**: Routine supplementation of iron and folic acid during pregnancy.
- g. **Treatment** against hookworm, malaria and hospital admission when needed.
- h. **Medical disorders in pregnancy** (diabetes, chickenpox)—appropriate intervention or referral for optimum care.

Combining all the above factors (health, social and policy actions) and by proper implementation of interventions against the major causes, maternal mortality can be avoided significantly in India.

Q. 4 Prenatal counseling is must—Justify

Ans. Prenatal counseling means **evaluation and then counseling a woman about pregnancy, its course and the likely outcome well before the time of actual conception**. The objective of prenatal counseling is that woman should enter the pregnancy in an optimal state of health which would be safe both to herself and the fetus. Otherwise many adverse factors begin to exert their effects by the time woman is seen in the antenatal clinic. Generally women are first seen in the antenatal clinic at around 14 weeks of gestation. By the time they are seen, organogenesis is completed. Preconceptional phase evaluation **helps to identify the high risk factor**. At the same it helps to organize care to reduce or to eliminate risk factor so that pregnancy outcome is improved.

Few examples of such benefits are:

- a. **Folic acid supplementation (4 mg a day)** starting 4 weeks before conception and continued upto 12 weeks of pregnancy. This can reduce the incidence of **neural tube defects**.
- b. Women with **medical complications (hypertension and diabetes) in pregnancy**, need education and treatment before conception. This is done to minimize complication like IUGR (hypertension), fetal malformations, macrosomia, IUFD (diabetes mellitus) and to improve the outcome of pregnancy.
- c. Many drugs used during the nonpregnant state should be avoided during pregnancy because of fetal hazards. **Warfarin, oral antidiabetic drugs are replaced with other drugs like heparin and insulin respectively for the safety of the fetus**.

This can only be done once the woman is seen and counseled before pregnancy (prenatal counseling). Therefore prenatal counseling is a must to improve the pregnancy outcome.

Q. 5**External cephalic version (ECV) has got a place in the management of breech presentation—Critically evaluate**

Ans. External cephalic version is a **maneuver done externally to change the fetal presentation** and to bring the fetal head to the lower pole of uterus. The success rate of version is about 60–70%. Version is usually done from 36 weeks onwards upto early labor.

Successful version has the following benefits:

- a. Reduction in the incidence of breech presentation at term.
- b. Reduction in the incidence of vaginal breech delivery.
- c. Reduction in the incidence of associated complications.

However it is true that not all cases of breech presentation are fit to be considered for ECV.

There are certain **contraindications of ECV** (antepartum hemorrhage, multiple pregnancy, contracted pelvis, previous cesarean delivery, etc.).

Moreover **ECV has got some complications** of its own. These are fetal distress, placental abruption, premature rupture of membranes, etc. These may necessitate immediate delivery.

Considering all the benefits and the risks, it appears that **each case should be selected carefully excluding the contraindications. Each case needs proper evaluation before and after the maneuver.** Cardiotocography should be done before and after the procedure to assess fetal well-being. Tocolytics may be used. Anti D immunoglobulin should be given to a Rh-ve woman after the procedure. ECV is done at or beyond 36 weeks and in the labor ward. Facilities for cesarean delivery must be there, should any complications develop during procedure. Therefore it appears on critical evaluation that external cephalic version has got a place in the management of breech presentation in a well-selected case.

Q. 6 **Twin pregnancy is a high risk one—Justify**

Ans. High-risk pregnancy is defined as one which is complicated with factor (s) that adversely affects the pregnancy outcome—maternal or perinatal or both. Considering this, twin pregnancy outcome is affected adversely by many factors. The adverse outcome affects the health of the fetus, the neonate or the mother.

Complications of twin pregnancy that affects the **maternal health** are nausea, vomiting, anemia, PIH and pre-eclampsia, polyhydramnios/oligohydramnios, preterm labor, malpresentation, antepartum hemorrhage, mechanical distress (dyspnea, palpitation), prolonged labor, operative interference and postpartum hemorrhage.

The **fetal hazards** are miscarriage, vanishing twin, fetus papyraceus, preterm birth, fetal anomalies, discordant growth, intrauterine death of one fetus, twin transfusion syndrome, cord prolapse, locked twins and increased perinatal mortality.

Complications are more in monozygotic twins. Perinatal mortality is markedly increased due to prematurity. Considering all these complications affecting the mother, fetus and the neonate, twin pregnancy is considered as a “high-risk pregnancy”.

The importance of defining the high-risk situation is to anticipate the complications. Simultaneously we have to adopt the preventive measures to avoid or to minimize the complications. For example antenatal supplementation of increased amount of iron and folic acid can meet up the increased demand and thereby can prevent complications due to anemia. Similarly during labor postpartum hemorrhage is a major threat to the mother. So twin pregnancy needs careful antenatal care and intrapartum care to prevent all these complications. Such a woman should be delivered in a hospital equipped with neonatal intensive care unit (NICU).

Q. 7

Introduction of partograph has reduced the incidence of prolonged labor and cesarean delivery—Critically evaluate the statement

Ans. Partograph is a **composite graphical record** of cervical dilatation, descent of fetal head, FHR and well-being of both the fetus and the mother. All these are depicted in a single sheet of paper, against the duration of labor in hours. The components of a partograph are designed to assess the progress of labor and the well-being of the mother and the fetus. In **cervicograph** (Philpott and Castle—1972), the **alert line** starts at 3 cm of cervical dilatation (WHO – 4 cm) and ends at 10 cm dilatation (at the rate of 1 cm/hour). The **action line** is drawn 3–4 hours (WHO – 4 hours) to the right and parallel to the alert line. **In a normal labor, the cervicograph (cervical dilatation) should be either on the alert line or to the left of it.** Labor is said to be **abnormal** when cervicograph crosses the alert line and falls on **zone 2**. Here the case needs careful reassessment. Intervention is required (ARM, oxytocin or delivery), when it crosses the action line and falls on **zone 3**.

Partograph has got many advantages. The main advantage is that it can detect deviation from normal course of labor early.

In a partograph (WHO, 1994), the labor process is divided into (i) **latent phase** that ends when the cervix is 4 cm dilated, (ii) **active phase** starts from cervical dilatation of 4 cm and ends at 10 cm dilatation. In the active phase, cervix should dilate at least 1 cm/hour. First stage of labor is considered **prolonged** when the rate of cervical dilatation is < 1 cm/hour in primigravida and < 1.5 cm/hour in multigravida. Similarly if the rate of descent of the fetal head is < 1 cm/hour in a primigravida and < 2 cm/hour in a multigravida it is called **prolonged**. **Secondary arrest** can be diagnosed when the active phase of labor commences normally but stops or slows down significantly for 2 hours or more prior to full dilatation of the cervix.

Obstructed labor can be diagnosed when the progressive descent of the presenting part is arrested inspite of good uterine contraction. This is often associated with maternal features of dehydration, exhaustion and sepsis. Fetal distress often is there. **Partograph can detect both the prolonged labor or obstructed labor early before any adverse effect on the mother or the fetus sets in.** Partograph abnormality suggests either early referral to an equipped center or an early intervention. In majority of cases intervention is in the form of ARM with or without oxytocin. When intervention is done timely, majority of cases result in successful vaginal delivery. So introduction of partograph has reduced the incidence of prolonged labor and cesarean delivery.

Q. 8 Exclusive breastfeeding should be encouraged

Ans. Exclusive breastfeeding means giving nothing orally other than colostrum and breast milk. Breastfeeding has got **several advantages** whereas **artificial feeding has got several disadvantages**. Considering the benefits of exclusive breastfeeding, all babies regardless of the type of delivery should be given **early and exclusive breast feeding** upto 6 months of age.

Benefits of early and exclusive breastfeeding

- A. Breast milk has got the **ideal composition** of a food for the newborn (fat, protein and carbohydrate) with low osmotic load.
- B. **Protection against** infection and deficiency states:
 - i. • **Lactoferrin**, lysozyme, interferon
 - **Long chain Ω -3 fatty acids** prevent infection
 - ii. **Vit D** protects against rickets
 - iii. **Passive immunity** (IgA, sIgA, IgG) : prevents infection from GI tract.
- C. **Breast milk is readily available**, more convenient, no cost, no preparation, better for neurodevelopment.
- D. **Natural contraception**
- E. **Additional advantages**: Laxative action, no risk of allergy, psychological: mother-child bonding, helps uterine involution, reduces the risk of rickets and scurvy.

Short and long-term risks of artificial feeding

- Infection – diarrhea
- Sudden infant death syndrome
- Chronic diseases
- Childhood obesity
- Adult obesity
- Atopic dermatitis
- Reduced intelligence quotient
- Type II diabetes mellitus
- Hypertension

Considering all the benefits of breast milk and the long-term as well as short-term risks of artificial feeding, exclusive breastfeeding should be encouraged.

Q. 9 Iron should be given to all antenatal mothers—Justify

Ans. Iron deficiency anemia is the common type of anemia in pregnancy specially in the tropical countries. In a healthy individual daily intake of dietary iron is about 15 mg. Daily loss is about 1.5 mg. Daily absorption of iron from duodenum is about 1.5 mg. With an absorption rate of 10%, the normal daily intake can meet up the daily normal loss of iron. But considering the socioeconomic status, several factors interferes with the normal amount of daily iron intake and absorption.

- a. Presence of phosphate, phytate in the food containing mainly carbohydrate, **impairs the absorption of iron.**
- b. Intestinal infestation with hookworm, amebiasis and conditions like diarrhea, hypochlorhydria **reduces iron absorption.**
- c. During pregnancy there are several reasons for the poor iron absorption. These conditions are : (i) inadequate intake of diet due to nausea, vomiting in pregnancy, (ii) presence of chronic infections like, asymptomatic bacteria and tuberculosis.
- d. Conditions in pregnancy where **iron loss is more** (i) loss through sweat repeated pregnancies at short intervals, (ii) pre-existing anemia due to excessive blood loss during menstruation, (iii) bleeding in pregnancy (APH piles) and (iv) chronic infections—urinary tract and malaria. Many women enter pregnancy with a pre-existent anemic state.
- e. Sometimes the **demand of iron in pregnancy is increased.** Conditions are multiple pregnancy (i) pregnancies that are too frequent (< 2 years of last delivery) and (ii) teen age pregnancy.

During pregnancy, **fetus is generally not affected** due to placental transfer of iron from the mother. As a result **mother suffers from iron deficiency.** Total amount of iron needed during pregnancy is about 1000 mg. The amount of iron absorbed from the diet and that mobilized from the store are inadequate to meet this demand of pregnancy. Therefore most women develops iron deficiency anemia. This results in depletion of the maternal reserve iron. The woman who has got sufficient reserve iron and is on a balanced diet is unlikely to develop anemia during pregnancy. But due to increased demand of iron during pregnancy, her reserve iron is utilized. Therefore she runs the risk of developing anemia during puerperium unless the extra demand of iron is met with.

Therefore, considering all the factors supplementation of iron should be given to all antenatal women.

Q. 10 Once cesarean delivery is not always cesarean delivery—
Analyze critically

Ans. Longback (1916), Edward Cragin said, “once a cesarean section, always a cesarean section”. This was said to reduce the complications of pregnancy with prior cesarean delivery, mainly the rupture of uterus. Currently, the scenario has changed because of many developments in obstetric management.

Women with prior cesarean delivery is a ‘high risk’ one. She needs regular antenatal check up, timely admission in hospital and delivery under supervision. **However**, woman needs individualization as regard the decision for subsequent mode of **delivery**. This may be vaginal birth after cesarean—trial of labor (VBAC-TOL) or repeat cesarean delivery. There are **several factors to be considered before making such a decision. These are**: (i) indications of primary cesarean section (CS)—recurrent or non recurrent, (ii) type of primary CS (lower segment or classical), (iii) number of previous CS, (iv) estimated weight of the baby, (v) adequacy of the pelvis and (vi) presence of any associated obstetric complications in the present pregnancy.

Women for VBAC-TOL are: (i) Previous lower segment CS with transverse scar, (ii) nonrecurrent indication, (iii) adequate pelvis for the fetus, (iv) without any other obstetric complications (placenta previa) (v) where continued labor monitoring is possible and (vi) availability of other resources like anesthetist, blood transfusion and emergency CS facilities round the clock are there.

Women should be counseled and informed consent should be taken. Many women (60–70%) deliver successfully vaginally after previous CS once all the above mentioned selection criteria are fulfilled. **Successful VBAC is commonly observed in women who have** (i) previous vaginal delivery, (ii) where primary CS was done due to nonrecurrent indication (breech presentation, fetal distress), (iii) women who start their labor spontaneously and (iv) where primary cesarean section was done during labor rather than electively. **Advantages of successful VBAC are** reduced the incidence of postpartum morbidity, infection, blood transfusion and hospital stay.

Therefore, all women with prior delivery by cesarean section need not necessarily **be delivered by cesarean section during the next pregnancy**. She could be delivered successfully by VBAC-TOL provided she is selected carefully with all the criteria as discussed above. She needs to be monitored carefully during labor.

Q. 11 Evaluate critically the role of ultrasound scan examination in modern obstetric practice

Ans. Ultrasound scan examination is considered an asset in modern obstetric practice. The information obtained by USG scan **in the first trimester** specially using transvaginal scan is immense. Fetal presence, viability, location, number, gestational age are the invaluable information obtained by USG. Ultrasound parameters (nuchal thickness, nasal bone) are used to detect fetal anomaly also.

The second trimester scan has the major importance of **fetal anomaly detection**. However these soft markers need for confirmation with some other invasive procedure which again needs the help of sonography. Commonly used sonographic markers of chromosomal anomalies are choroid plexus cyst, short femur, cleft lip/palate, low set ears, nuchal translucency, renal anomalies and cardiac defects.

Fetal biometry is done for gestational age determination in the second trimester. Commonly used parameters are biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC) and femur length (FL). The variation is 10–14 days.

Obstetric intervention: Ultrasonography can be used as an adjunct to many interventions in obstetrics like amniocentesis, CVS or cordocentesis.

Doppler ultrasound is of value in assessing fetal well with fetal blood flow study in the umbilical artery, middlecerebral artery, the usual benefit of fetal biometry and other diagnostic benefits in diagnosis of placenta praevia (placenta previa).

USG for coexistent pathology: Ultrasound scan can detect any coexistent pathology (ovarian cysts) during pregnancy.

USG is valuable in postpartum period to detect any retained bits of placenta or the diagnosis of deep vein thrombosis. Unfortunately it has the limitations and that it suffers from the misuse. Ultrasound examination during pregnancy may cause anxiety to the woman due to its exposure to the fetus.

Considering the benefits of use in obstetric practice, ultrasonography is of immense value provided it is used rationally.

Q. 12 Prophylactic forceps delivery is beneficial—Give reasons

Ans. Forceps delivery is done to expedite the process of delivery during the second stage of labor. Provided the criteria are fulfilled prior to forceps operation and the operator is an experienced one, it is beneficial both to the mother as well as the baby. Indications of forceps operation may be (i) maternal (inadequate expulsive efforts) (ii) Fetal (fetal distress) or (iii) others (prolonged second stage of labor).

Prophylactic forceps are the applications of forceps in the second stage of labor to deliver the fetus when some complications either to the fetus or the mother are being anticipated.

Therefore it is done to cut short the second stage of labor before any maternal and/or fetal complication actually develops. The common indications of prophylactic forceps are: (i) Eclampsia (ii) heart disease (iii) severe pre-eclampsia (iv) prior cesarean delivery and (5) patients under epidural analgesia. The benefits of prophylactic use of forceps are:

- ♦ **In eclampsia:** Repeated convulsions and its associated complications can be reduced (Dutta Obs 8/e, p 274).
- ♦ **In heart disease:** Risks of cardiac failure can be reduced (Dutta Obs 8/e, p 323).
- ♦ **In severe pre-eclampsia:** Risk of eclampsia can be reduced (Dutta Obs 8/e, p 264-5).
- ♦ **In prior cesarean delivery:** Risk of scar rupture can be reduced (Dutta Obs 8/e, p 385).
- ♦ **In women under epidural analgesia:** Risk of prolonged second stage and the associated risks of fetal distress can be reduced (Dutta Obs 8/e, p 593).

Therefore prophylactic forceps delivery is beneficial both for the mother and the baby in some selected cases. However prophylactic forceps should not be applied until the criteria of low forceps are fulfilled. The operator must be an experienced one.

Q. 13 Prophylactic ergometrine should not be given to all laboring women to prevent postpartum hemorrhage—Discuss

Ans. Ergometrine is a powerful oxytocic. It excites powerful myometrial contraction which lasts for 3 hours. It is very effective when used as a prophylaxis against postpartum hemorrhage in the active management of third stage of labor. However in spite of its beneficial effects it is not completely free from risks and side effects.

There are certain risks of its use:

1. It causes nausea and vomiting. These side effects are more common.
2. It should not be given to any woman who is suffering from **organic cardiac disease**. It causes squeezing of blood from utero placental circulation into the systemic circulation. There is overloading of the right heart and the risk of heart failure.
3. When given in a woman with **severe pre-eclampsia and eclampsia**, there is further sudden rise of blood pressure due to its vasoconstrictor effect. This may precipitate further convulsions or other complications (cerebral hemorrhage).
4. In a woman with suspected **multiple pregnancy**, if given after the delivery of the first baby the second baby suffers from hypoxia. This is due to tetanic contraction of the myometrium.
5. It should not be given to a **Rh-negative woman**, as the risks of fetomaternal hemorrhage is more.

Besides the above mentioned contraindications methergin also has got few other side effects. These are—Rise in blood pressure, bronchospasm, poor lactation and even myocardial infarction. However oxytocin is a better substitute in such cases.

Q. 14 All pregnant women should undergo hemoglobin estimation during antenatal booking—Give reasons

Ans. Hemoglobin estimation

Estimation of hemoglobin and testing of ABO and Rh grouping is recommended as a routine to all pregnant woman throughout the world. These two tests are essential for all pregnant women for the following reasons:

During pregnancy any woman with hemoglobin level—11 gm/dL is considered anemic (WHO). Moreover any woman with hemoglobin level—9 gm/dl needs investigation to find out the cause of anemia and treatment.

Anemia is a common problem in many countries throughout the world during pregnancy. Anemia is a major (20%) cause of maternal death in India. It is entirely a preventable death. Benefits of estimating hemoglobin during pregnancy are many. Antenatal check up gives us an opportunity for screening anemia during pregnancy early. Once detected the woman is thoroughly investigated to find out the cause of anemia. This is helpful to treat anemia specifically. Once diagnosed and appropriately treated, many complications of anemia in pregnancy, labor and puerperium can be prevented. **Complications of anemia** like cardiac failure, preeclampsia, infection, postpartum hemorrhage or shock could be avoided. Thus maternal mortality can be reduced significantly.

Deficiency anemia, mainly the iron deficiency anemia is common in India. Depending upon the severity of iron deficiency treatment could be started by giving adequate diet and oral or parenteral iron or even blood transfusion. This will help to build up her hemoglobin early before the woman goes into labor. Blood transfusion may be given in few cases depending upon the duration of pregnancy and levels of hemoglobin.

Thorough investigations can diagnose few **cases of the hemoglobinopathies** which are not uncommon in India. Special management can be initiated so that maternal and perinatal deaths are avoided in such cases also. Thus estimation of hemoglobin is of immense value for all pregnant woman during antenatal booking.

Q. 15 All pregnant women should have ABO, Rh grouping in pregnancy—Discuss

Ans. ABO and Rh grouping: In the modern society knowledge of ABO and Rh grouping is essential to all individual not to speak of a pregnant woman. Accident and emergency never come with prior intimation. Prior knowledge of ABO and Rh saves much time in an emergency situation. This is in terms of either receiving blood transfusion or donating blood.

- ♦ Pregnancy complication like ectopic pregnancy, antepartum hemorrhage, post partum hemorrhage are often faced as emergency and are managed with urgent transfusion with appropriate group, type and cross-matching. Prior knowledge of ABO, Rh saves much valuable and golden moments to save a life.
- ♦ This knowledge also helps in prearranging donors or blood in a case when there is scarcity of blood availability or in cases with uncommon ABO-Rh grouping (Rh negative woman).
- ♦ Women who are found Rh-negative, are further investigated (indirect Coombs' test, amniocentesis, cordocentesis) to assess the severity of fetal affection during pregnancy and also for treatment. This helps to improve perinatal outcome in a rhesus negative woman.
- ♦ The knowledge of ABO-Rh grouping of the woman is also helpful in the diagnosis of jaundice and certain hemolytic disease of the newborn (Mother: O and fetus A or B).

Therefore the testing ABO-Rh grouping is of utmost importance to all pregnant woman in the antenatal clinic.

Q. 16 Emergency obstetric care (EmOC) is one of the effective strategies for preventing maternal deaths in India—Discuss

EmOC is the care provided emergently (urgently) to a pregnant woman during the time of emergency arising out of any obstetric complication.

In India lead causes of maternal deaths are:

1. Obstetric hemorrhage due to PPH, APH and hemorrhage related to abortion, ectopic pregnancy and molar pregnancy.
2. Hypertensive disorders in pregnancy: Preeclampsia, eclampsia and HELLP syndrome.
3. Sepsis: Puerperal sepsis and septic abortion.
4. Obstructed labor and rupture uterus.
5. Medical disorders in pregnancy: Anemia and jaundice.

These complications often arise as an emergency and without any warning. In India three delays are the important causes of maternal deaths. These delays prevent women with obstetric complications to access and receive treatment in time. Most of these women are admitted with a grave condition. Unless they are provided with an appropriate intervention urgently, most of them would die. Interventions may be different for an individual case. For example, blood volume replacement (crystalloids, colloids, blood transfusion) and use of oxytocics in a case with atonic PPH are the essential emergency obstetric care. Case of eclampsia and severe preeclampsia are often seen as an emergency in the periphery centers. Injection magnesium sulphate if given as an emergency case before referral, can save the life of the women. Time is an important factor for these women, to avail the EmOC. Once emergency care is provided, rest of the care could be organized with referral and time. It is now well known that nonavailability of EmOC, is the root cause of maternal mortality. However it is important to remember that not only the EmOC must be timely available but it should be a quality care. Only then it would be effective to prevent maternal deaths.

Therefore EmOC is an effective strategy in preventing maternal deaths in India.

Q. 17 Only antenatal care cannot prevent all maternal deaths—Discuss

Ans. Antenatal care (ANC) is the periodic, regular and systematic supervision of a woman during pregnancy. ANC is mainly focussed to screen the high-risk cases and to improve maternal health through education, counseling and care.

In India lead causes of maternal deaths are: (i) Hemorrhage, (ii) hypertensive disorders, (iii) sepsis, (iv) obstructed labor and rupture uterus and (v) medical disorders in pregnancy, like anemia, jaundice. Antenatal care is an important part of the total care during pregnancy, labor and puerperium. However ANC cannot prevent all obstetric complications that arise suddenly and without any warning during pregnancy, labor and puerperium. Delay in treatment or no treatment may end in maternal deaths due to complications arising at any of the stage of pregnancy, labor or puerperium. Therefore, emergency obstetric care (EmOC) is an essential service to save mothers from death. It has been known that majority (75%) of maternal deaths occur during intrapartum or immediate postpartum period and the rest (25%) occur in antenatal period. This highlights the importance of the time of labor.

Therefore, good antenatal care alone cannot reduce maternal mortality entirely. Only a good ANC cannot ensure an uneventful intrapartum and postnatal periods. This is because many complications during labor and immediate puerperium are grave and may arise suddenly and unpredictably. Risk screening approach in ANC has many limitations. Interventions made during ANC may not have a major impact in reducing MMR. Management done during ANC are not the same to manage the complications of labor and puerperium. Risk screening in ANC may not identify all women at risk of deaths. Every pregnancy is at risk till she passes the course of labor and puerperium uneventfully. Therefore only ANC cannot prevent all maternal deaths.

Q. 18 Oxytocin should be used judiciously in the management of labor

Ans. **Oxytocin** is a nonapeptide released from the posterior pituitary. Synthetic oxytocin is currently used in obstetrics as a powerful uterotonic drug. Common indications of use are: 1. **Therapeutic (mainly)** and 2. **Diagnostic** (not commonly used).

1. **Therapeutic use** may be in (A) pregnancy, (B) labor and (C) puerperium

(A) **Pregnancy:** Early pregnancy: To induce abortion, to stop bleeding in following evacuation of uterus (incomplete abortion).

Late pregnancy: To induce labor.

(B) **Labor:** Augmentation labor (therapeutic), **active management of third stage of labor (Preventive use-against PPH).**

(C) **Puerperium:** To control post partum hemorrhage.

Use of oxytocin is very much beneficial. But it must be used judiciously otherwise complications occurs that may endanger the mother, baby or the both.

- One must be careful to exclude the **contraindication of its use** in late pregnancy and labor like:
 - (a) Grand multipara, (b) contracted pelvis, (c) history of prior cesarean delivery, (d) malpresentation, (e) presence of fetal distress and (f) obstructed labor. Moreover when oxytocin is being used in infusion, it has to be monitored very carefully. Otherwise many complications may occur.

The important complications are:

- a. **Uterine hyperstimulation**—leading to fetal distress
- b. **Uterine rupture**—leading to maternal and fetal death
- c. **Fetal distress**—due to fetal hypoxia
- d. **Others**—water intoxication and hypotension

For all these reasons, use of oxytocin must be judicious to get the benefits otherwise complications may occur.

Q. 19 Active management of third stage of labor (AMTSL) should be done as a routine—Discuss

The principles of third stage labor management are:

- To ensure since vigilance
- To follow the guidelines strictly in practice.

The **purpose** is to prevent complications, mainly the postpartum hemorrhage (PPH).

PPH is the lead cause of maternal deaths in India.

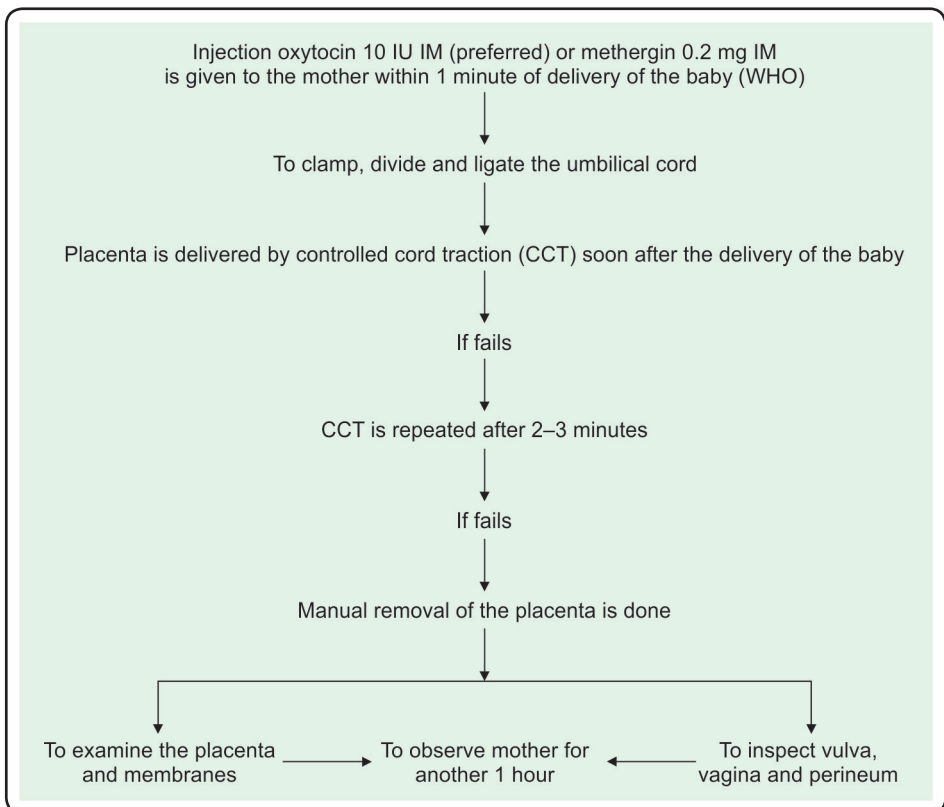
Active management is preferred over expectant management

Advantages are:

- It stimulates powerful uterine contractions when given within 1 minute of delivery of the baby by parental (IM) oxytocics (WHO).
- There is early separation of placenta.
- Third stage blood loss is reduced to one-fifth.
- There is shortening of the duration of third stage.

Procedures

Injection oxytocin 10 IU intramuscular (IM) (preferred) or methergin 0.2 mg intramuscular (IM) is given to the mother within 1 minute of delivery of the baby (WHO).



SPACE FOR NOTES

CHAPTER

7

Operative Obstetrics

- **Dilatation and Evacuation**
- **Suction Evacuation**
- **Episiotomy**
- **Forceps Delivery**
- **Ventouse Delivery**
- **Cesarean Section**
- **Destructive Operations**

Chapter Objectives

To demonstrate knowledge and understanding of:

- Surgical anatomy of abdomen and the pelvic organs
- Outlines of common surgical procedures
- Case selection (indications of surgery)
- Principles of the surgical procedure
- Principles of homeostasis and hemostasis
- Post-operative care
- Surgical complications
- Follow-up procedures

1. DILATATION AND EVACUATION (D and E)

Indications: (i) Incomplete abortion, (ii) inevitable abortion, (iii) MTP (6–8 weeks) and (iv) evacuation of hydatidiform mole.

Principal steps: The preliminary steps are A. Antiseptic cleaning with savlon / povidone - iodine solution B. Perineum is draped with sterile towels.

- (i) Sims's posterior vaginal speculum is introduced, anterior lip of the cervix is grasped by an Allis tissue forceps. The uterine sound is avoided as it may cause perforation or bleeding.
- (ii) The cervix is dilated using the metal dilator (Hegar's or Hawkin Ambler's) upto the desired extent.
- (iii) The products are removed by the ovum forceps. The uterine cavity is curetted gently by a blunt curette. Injection methergin (0.2 mg) is given IV.
- (iv) The speculum and the Allis forceps are removed. The uterus is massaged bimanually. The vagina and the perineum are cleaned and a sterile vulval pad is placed.

Complications of D and E operation

Immediate: (i) Hemorrhage, (ii) Injury (cervix), (iii) uterine perforation, (4) Infection (sepsis) and (v) shock.

Remote: (i) Pelvic inflammation, (ii) infertility, (iii) cervical incompetence, (iv) uterine synechiae.

Q. How do you manage a case of uterine perforation diagnosed during D and E?

- Ans. A.** Small perforation with a sound or with a small size dilator - usually conservative management is done. Patient is kept admitted, and the vital parameters, bleeding P/V are monitored.
- B.** When the perforation is a big one patient may need laparotomy or laparoscopy to manage the perforation.

2. SUCTION EVACUATION

Indication: (i) Medical termination of pregnancy (first trimester), (ii) Incomplete abortion. (iii) Inevitable abortion (first trimester) and (iv) Hydatidiform mole.

Important steps:

1. Initial steps upto dilatation of the cervix are the same as discussed in D and E operation.
2. The suction cannula (Fig. 7.1) is filled to the suction apparatus. The cannula size is generally the same to the weeks of pregnancy to be terminated (e.g. size 7 is for 7 weeks of pregnancy). The cannula is introduced into the uterus.
3. The pressure (negative) of the suction machine is raised to 400–600 mmHg. The cannula is moved up and down and also rotated within the uterine cavity to get the

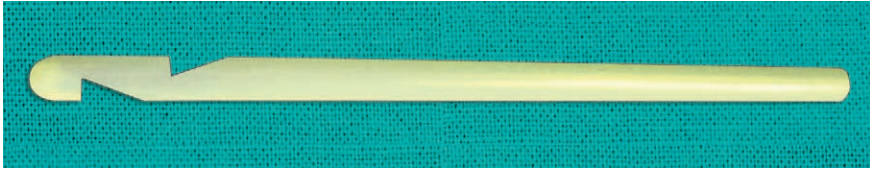


Fig. 7.1: Plastic suction cannula (Karman's type)

curette like effect. **The end point of suction is denoted by:** (i) No more material is being sucked out, (ii) gripping of the cannula by the uterus, (iii) grating sensation, (iv) appearance of bubbles in the cannula.

4. The vacuum is broken and the cannula is withdrawn. The uterine cavity is gently curetted by a blunt flushing curette.
5. The vagina and vulva are cleaned and a vulval pad is placed.

Q. What are the complications of suction and evacuation?

Ans. Complications are similar to D and E (see above). However the risk of uterine perforation is less.

Q. What are the signs of completion of the procedure?

Ans. ♦ No more products of conception is seen to come out.
 ♦ Air bubbles are seen to come out
 ♦ Uterus contracts around the cannula (gripping effect)
 ♦ Gritty sensation is felt

Q. How the cannulas are sterilized ?

Ans. The cannulas are sterilized with ethylene oxide and remain sterile as long as the package is intact.

3. MVA (MANUAL VACUUM ASPIRATION)

Q. How to charge the aspirator ?

Ans. 1. To check the instruments (Figs 7.2 and 7.3):
 a) The valve, cap, liner all are in place
 b) The plunger is pushed all the way inside the cylinder
 c) Collar stop in place
 2. Push the valve buttons downwards and forwards until they lock
 3. Pull the plunger back until the arms snap outward and catch on the cylinder base. The aspirator is now charged.

Q. Outline the procedure of MVA?

(Initial steps are the same to that of suction evacuation)

- a) The appropriate size cannula is inserted and the cannula tip should go beyond the internal OS and to remain inside the uterine cavity.
- b) The cannula is attached to the charged aspirator
- c) Buttons are released to create vacuum

- d) Products of conception are evacuated by rotating the cannula 1800 in each direction and also with in and out motion.
- e) When finished, the buttons are depressed and the instruments are withdrawn. If the procedure needs to be repeated, the aspirator is emptied, recharged and may be used again or a second aspirator may be used.

Q. What are the signs of completion of the procedure ?

Ans. Same as that of suction evacuation.

Q. How the cannulas are sterilized ?

The cannulas (Fig. 7.3) are sterilized with ethylene oxide and remain sterile as long as the package is intact.

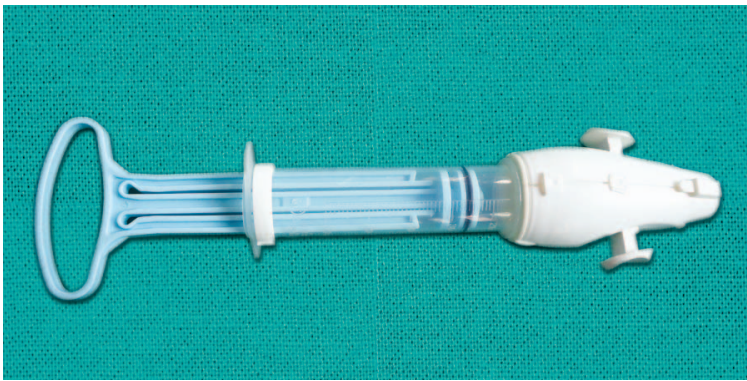


Fig. 7.2: MVA Syringe



Fig. 7.3: MVA Cannula

4. EPISIOTOMY

Q. What are the common indications of episiotomy?

Ans. (i) Rigid perineum, (ii) malpresentation and malposition: Breech delivery, face to pubis delivery, shoulder dystocia, (iii) operative vaginal delivery: Forceps, ventouse and (iv) previous perineal surgery: Pelvic floor repair.

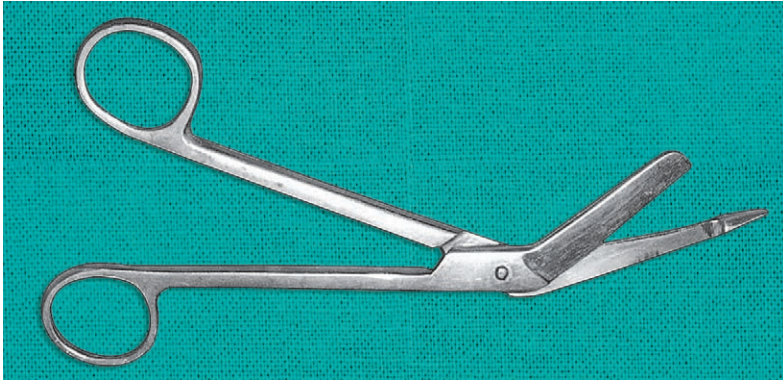


Fig. 7.4: Episiotomy scissors

Q. What are the different types of episiotomy?

Ans. Episiotomy could be made as: (i) Mediolateral, (ii) median, (iii) lateral or (iv) J. Shaped. However commonly mediolateral episiotomy is done. Mediolateral episiotomy is safe and it can be extended if necessary. However blood loss may be little bit more.

Q. What are the structures cut in episiotomy?

Ans. (i) Posterior vaginal wall, (ii) superficial and deep transverse perineal muscles, including bulbospongiosus and levator ani, (iii) fascia covering those muscles, (iv) transverse perineal branches of pudendal vessels and nerves and (v) subcutaneous tissue and skin.

Q. What are the important steps in the repair of episiotomy?

Ans. Repair of episiotomy is done in three layers.

1. Vaginal mucosa and submucosal tissues
2. Perineal muscles
3. Skin and subcutaneous tissues.

Suture material commonly used is No "0" chromic catgut for all the layers, interrupted sutures are used. In that case patient could be discharged after 24–48 hours.

Q. Mention some of the important complications of episiotomy?

Ans. A. Immediate. B. Remote.

A. Immediate

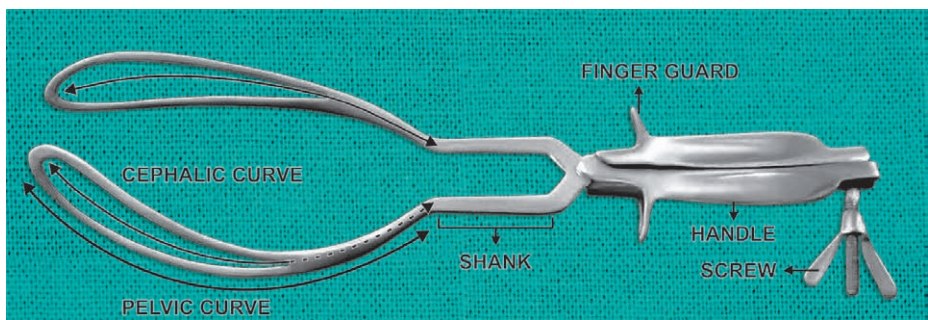
- i. Extension of the incision to involve rectum. This is more common in median episiotomy.
- ii. Vulval hematoma
- iii. Infection and wound dehiscence

B. Remote:

- i. Dyspareunia
- ii. Painful scar

5. FORCEPS**Q. What are the different varieties of obstetric forceps?****Ans.** Varieties are:

- a. Long curved obstetric forceps with or without axis traction (Das's variety) device (Fig. 7.5).
- b. Short curved (Wrigley's) forceps
- c. Kielland's (rotational) forceps.

**Fig. 7.5:** Long curved obstetric forceps**Q. What are the different parts of a long curved obstetric forceps?****Ans.** P. 265**Q. What are the different types of forceps delivery?****Ans.** Types of forceps delivery are:

- a. Outlet forceps (commonly done),
- b. Low forceps,
- c. Mid forceps, and
- d. High forceps (abandoned).

Q. What are the different functions of the forceps?**Ans.** P. 265**Q. What are the indications of forceps delivery?****Ans.** Indications are grouped into (A) maternal, (B) fetal and (C) others.**A. Maternal**

- i. Maternal distress
- ii. Cardiac disease
- iii. Severe pre-eclampsia

B. Fetal

- i. Fetal distress
- ii. Aftercoming head of vaginal breech delivery

C. Others: Prolonged second state of labor.

Q. What are the conditions that should be fulfilled prior to application of forceps?

Ans. The important ones are:

- a. Fetal head must be engaged
- b. Cervix must be fully dilated
- c. Membranes must be ruptured
- d. Pelvis must be adequate
- e. Bladder must be emptied
- f. Fetal head position, rotation and station must be correctly known
- g. Patient's consent (verbal or written) to be taken.

Q. What are the complications of forceps delivery?

Ans. Complications are:

A. Maternal and B. Fetal

A. Maternal

- a. Injury – vaginal laceration and cervical injury
- b. Postpartum hemorrhage
- c. Infection

B. Fetal

- a. Cephalhematoma
- b. Intracranial hemorrhage
- c. Injury to face

Q. What is prophylactic forceps?

Ans. see p 221 and 266

Q. What is trial of forceps?

Ans. see p 266

Q. What is failed forceps?

Ans. see p 266

STEPS OF FORCEPS DELIVERY

Case Summary

Mrs. AS, 34 years old lady, was seen in labor in her first pregnancy. It was a term pregnancy that had spontaneous onset of labor. She progressed into the second stage of labor uneventfully. After one and half hour of second stage of labor fetal bradycardia was observed. It remained persistent for another 10 mins. She was reassessed. Pelvic examination fulfilled the criteria for low forceps delivery. She was prepared for low forceps delivery.

FIGS 7.6 TO 7.13 LOW FORCEPS DELIVERY



Fig. 7.6: Left blade of the forceps is introduced first. The left handle is held by the three fingers (index, middle and the thumb) of the left hand. Thumb pressure is used to introduce the blade under guidance of the fingers of the right hand.

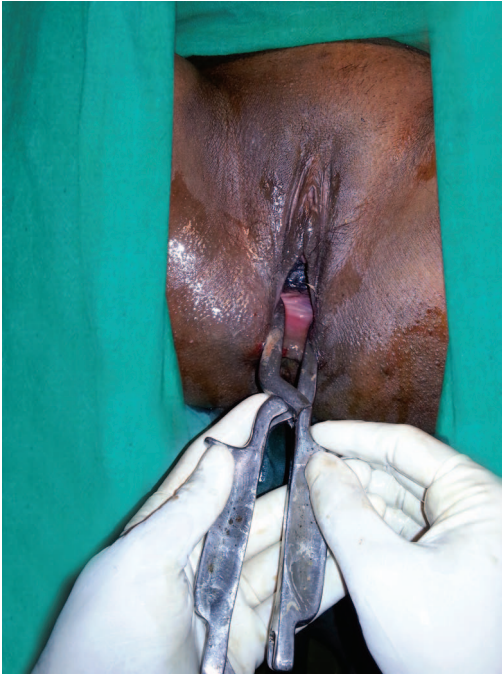


Fig. 7.7: Locking of the blades. Blades are locked easily when applied correctly (bimalar, biparietal placement)



Fig. 7.8: Direction of pull: First: Downwards and backwards until the head is in perineum → Straight and horizontal (seen) towards the operator.



Fig. 7.9: Pull is now changed and directed upwards and forwards towards the mother's abdomen. The head is delivered slowly by extension.



Fig. 7.10: The blades are removed. Head is delivered slowly. Ritgen's maneuver is seen.



Fig. 7.11: Delivery of the shoulder. Note that the bisacromial diameter lies in the antero-posterior diameter of the outlet of the pelvis. Also note that the anterior shoulder is being released slowly from under the symphysis pubis.



Fig. 7.12: Delivery of the trunk and that of the baby was done completely.



Fig. 7.13: Immediate care of the newborn was done. Cord clamping and Apgar rating was done (Apgar score: 8 and 10)

6. VENTOUSE

Q. How ventouse works?

Ans. Ventouse is an instrumental device (Fig. 7.14) used to assist delivery by creating a vacuum between the cup and the fetal scalp.

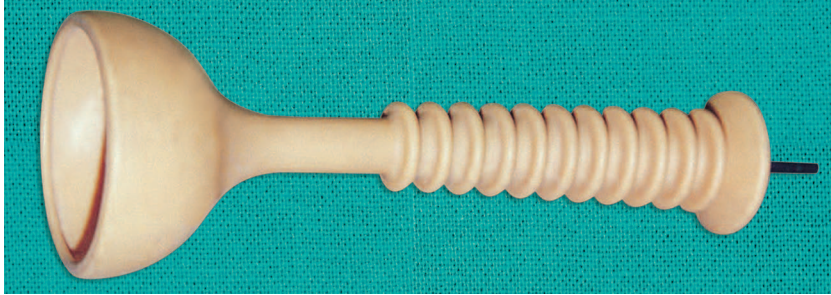


Fig. 7.14: Ventouse cup—Silastic

Q. What are the indications of ventouse delivery?

Ans. Indications are the same as that of forceps delivery

Common indications are:

- a. Maternal exhaustion, b. fetal distress and c. prolonged second stage of labor.

Q. What conditions should be fulfilled before application of ventouse?

Ans. Criteria to be fulfilled are the same as that of forceps. This is according to the guidelines (ACOG 2000).

Q. What is the flexion point ?

Ans. It is an imaginary site located midsagittally on the fetal head about 6 cm behind the center of the anterior fontanella or 2 cm in front of the posterior fontanelle.

Traction force centered over this site by either ventouse or forceps, promotes flexion and brings the smallest cranial diameter to the pelvis.

Q. What are the contraindications of ventouse delivery?

Ans. Important contraindications are:

- a. Any presentation other than vertex
- b. Preterm fetus <34 weeks.

Q. What are the advantages of ventouse over forceps?

Ans. Important advantages of ventouse over the forceps are:

- a. It can be used in unrotated head (occiput posterior position) as it helps autorotation.
- b. It does not occupy any space like the forceps.
- c. Perineal and pelvic floor injuries are less.
- d. Easier to learn and apply.

Q. What are the advantages of forceps over ventouse?

Ans. Advantages of forceps over ventouse are:

- a. Forceps can quickly deliver the baby as in a case of fetal distress.
- b. Higher rate of successful delivery compared to ventouse (ventouse has higher failure rates).
- c. Forceps are used effectively where moderate force is required.
- d. It can be used for any gestational age fetus.

Q. What are the complications of ventouse delivery?

Ans. Important complications of ventouse delivery are:

- A. Neonatal: (a) Scalp abrasion, (b) cephalhematoma (less), (c) Retinal hemorrhage.
- B. Maternal (a) Injuries are less compared to forceps.

7. CESAREAN SECTION

Q. Mention some of the common indications of cesarean section.

Ans. Common indications are:

- | | |
|-------------------------------|----------------------------|
| ◆ Failed induction of labor | ◆ Fetal distress |
| ◆ Cephalopelvic disproportion | ◆ Antepartum hemorrhage |
| ◆ Previous cesarean delivery | ◆ Malpresentation (Breech) |

Q. Mention the important steps in lower segment cesarean section.

Ans. i. Preoperative preparation

ii. Anesthesia: general or spinal or epidural

iii. Antiseptic painting (povidone iodine 7.5%) and draping.

iv. Skin incision — suprapubic transverse (commonly used).

v. Opening up of the peritoneal cavity — Doyen's retractor is introduced.

vi. Peritoneal incision → lower segment transverse incision → uterine muscle incision → lower segment transverse.

vii. Delivery of the head: The membranes are ruptured → The Doyen's retractor is removed. The hand is insinuated and the palm is placed below the head. The head is delivered by the hand → suctioning of the baby's mouth is done.

viii. Delivery of the trunk of the baby is done slowly. The cord is cut in between two clamps. The baby is handed over to the pediatrician/nurse. The Doyen's retractor is reintroduced.

ix. Delivery of the placenta and membranes slowly and completely.

x. Repair of the uterine wound. The margins of the uterine wounds are picked up by Allis tissue (Green Armytage) forceps (Total 4; one on each corner of the incision and one each on upper and lower margin).

Q. What are the complications of cesarean section?

Ans. The complications are mainly maternal. These may be:

- A. Intraoperative: • Extension of uterine incision • Injury to bladder, ureter • Hemorrhage • Fetal/neonatal: inadvertent injury, scalpel cut.
- B. Post-operative: (a) Immediate: PPH, shock, infections (wound)
- (b) Remote: Incisional hernia, scar rupture in future pregnancy.

OPERATIVE PROCEDURE OF LOWER SEGMENT CESAREAN SECTION

FIGS 7.15 TO 7.26



Fig. 7.15: Operation trolley with all the instruments for cesarean section

1. Towels for draping, 2. Suction tube (with canula), 3. Electrodialthermy set, 4. Mops (Large swabs), 5. Towel clips, 6. Kidney dish Gauze pieces, 7. Bowl with povidone iodine, 8. Empty bowl, 9. Needle holders (curved and straight variety), 10. Sponge holding forceps, 11. Knives, 12. Dissecting forceps (toothed and non-toothed), 13. Scissors (3), 14. Artery Forceps (short variety), 15. Kochers forceps, 16. Allis tissue forceps, 17. Lanes tissue forceps, 18. Little Wood's forceps, 19. Green Armytage Forceps, 20. Obstetric Forceps, 21. Doyen's retractor, 22. Suture Packets

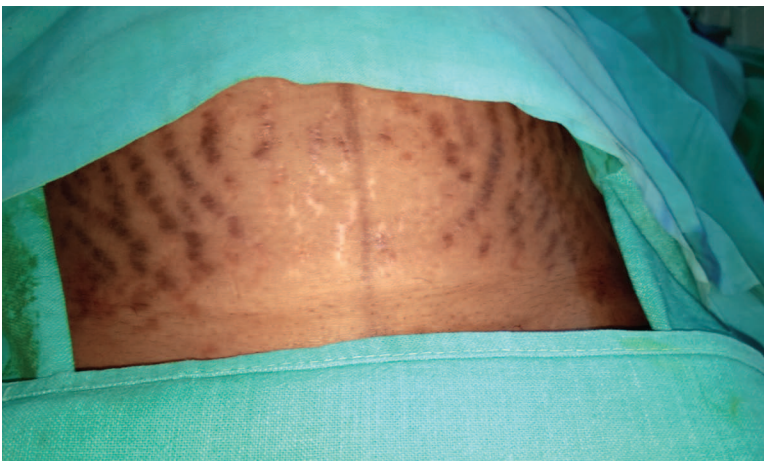


Fig. 7.16: Abdomen is painted with povidone iodine solution and is draped with sterile towels. Only the area of operation is exposed.

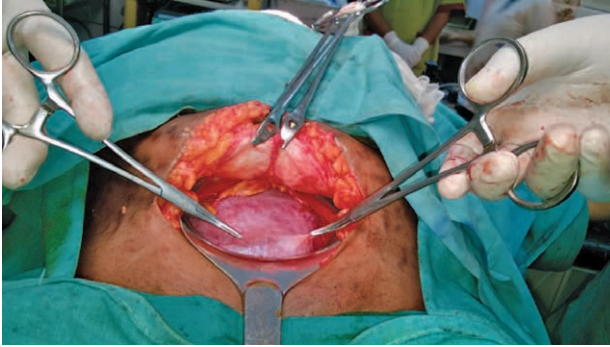


Fig. 7.17: Abdomen is opened by modified Pfannenstiel incision. Loose peritoneum of the uterovesical pouch is being stretched out and shown. It is incised transversely.

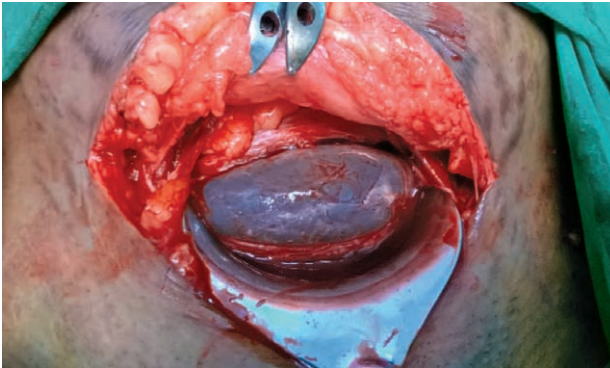


Fig. 7.18: Uterine Muscle incision (low transverse) has been made in this lower segment of the uterus (LSCS). The amniotic membrane is seen to bulge out with the pressure of amniotic fluid. This amniotic membrane needs to be ruptured to deliver the baby. Doyen's retractor is seen in place.



Fig. 7.19: Delivery of the head. The amniotic fluid is sucked out following rupture of the membranes. Doyen's retractor is removed. The head is delivered slowly with the fingers of the right hand, insinuated between the head and the lower uterine flap. Assistant applies some pressure on the fundus at this time.



Fig. 7.20: Delivery of the baby is on progress. It is to be done slowly. The head is delivered by elevation and flexion using the fingers to act as a fulcrum. Note that Doyen's retractor has been taken out.



Fig. 7.21: Delivery of the head in cesarean section. Suctioning of the mouth, pharynx, is being done gently before delivery of the trunk



Fig. 7.22: Baby is delivered slowly. The cord is clamped and cut in between (See details of steps in the CD incorporated). Baby is handed over to the neonatologist for immediate care of the new born

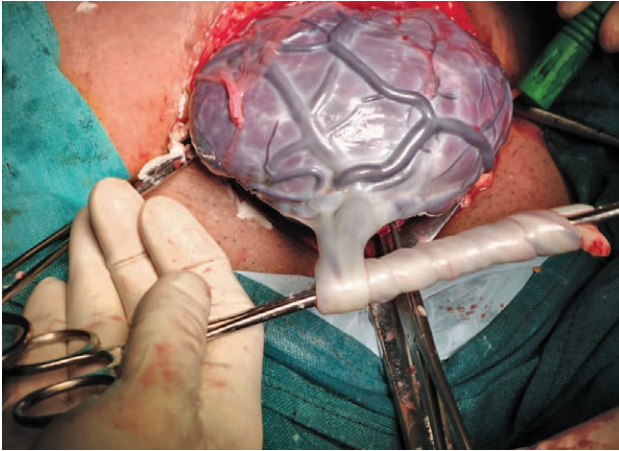


Fig. 7.23: Delivery of the placenta and membranes: Placenta is allowed to separate spontaneously. Placenta is delivered by traction on the cord (right hand). Simultaneously the uterus is pushed upwards using the left hand. Note the abdominal retractor (Doyen's) is reintroduced

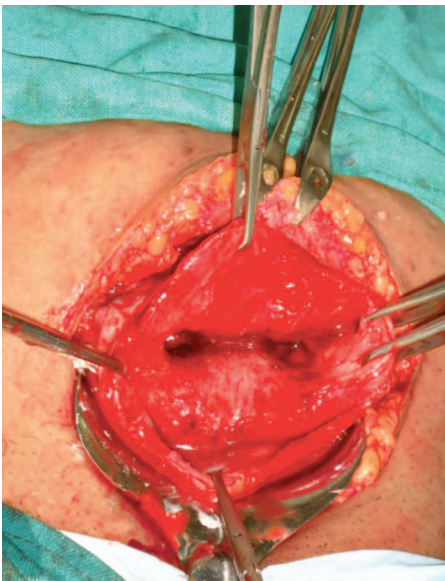


Fig. 7.24: The uterine wound is seen following delivery. Usually four Allis's tissue forceps (Green Armytage forceps) are used to hold the incision margins, two (one each) on the angles of incision. Another two (one each) on the upper and lower uterine flap

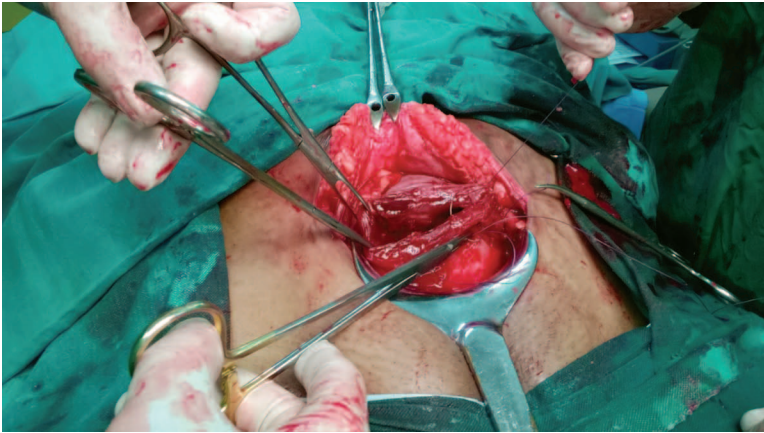


Fig. 7.25: Suturing of the uterine wound. It is done in two or three layers. It may be done keeping the uterus in the abdominal cavity or delivering it out (eventration). Suture material is No. '0' chromic catgut or Vicryl-0 with round bodied needle. A continuous running suture taking deeper muscles is made. A similar suture is placed taking the superficial muscles overlapping the first layer. Non closure of the visceral peritoneum is preferred.

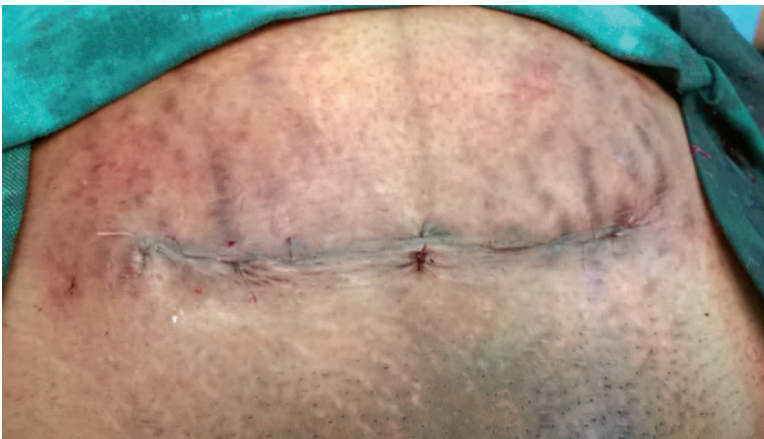


Fig. 7.26: Closure of the abdomen. The mops are removed and the number verified. Peritoneal toileting is done. Doyen's retractor is removed. The abdomen is closed in layers. The vagina is cleaned of blood and blood clots. A sterile vulval pad is placed.

7. DESTRUCTIVE OPERATIONS

Q. Name some of the destructive operations?

Ans. (i) Craniotomy, (ii) Evisceration, (iii) Decapitation, (iv) Cleidotomy.

Q. What are the indications of craniotomy?

Ans. i. Fetus with hydrocephalic head, either living or dead
ii. Obstructed labor with a dead fetus in cephalic presentation.

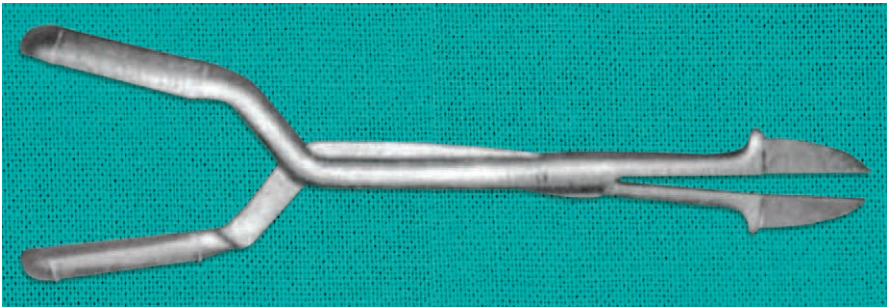


Fig. 7.27: Perforator (Oldham's)

Q. What are the contraindications of craniotomy?

Ans. (i) Severely contracted pelvis, where the fetus cannot be delivered even if the head contents are evacuated. (ii) Rupture of uterus — laparotomy should be done. Rupture uterus must be excluded before doing craniotomy.

Q. What should be the postoperative care following any destructive operation?

i. A self retaining (Foley's) catheter is inserted for 3–5 days
ii. Antibiotics is to be continued.

Q. What are the complications of a destructive operation?

Ans. (i) Injury to the uterus, cervix, vagina, (ii) rupture of uterus, (iii) postpartum hemorrhage — atonic and/or traumatic, (iv) shock, (v) injury to the adjacent organs: vesicovaginal or rectovaginal fistula, (vi) puerperal sepsis, (vii) subinvolution and (viii) prolonged ill health.

CHAPTER

8

Practical Obstetrics

- **Obstetric Instruments**
- **Specimens**
- **Imaging Studies**
 - ❖ **Ultrasonograms (USG)**
 - ❖ **Magnetic Resonance Imaging (MRI)**
- **Drugs in Obstetrics**



PRACTICAL OBSTETRICS

Fig. 8.1: Clinical thermometer: Celsius temperature scale ($^{\circ}\text{C}$) is SI derived unit and is known as Celsius after the name of the scientist who introduced it. *Conversion of Fahrenheit to Celsius* — Subtract 32, multiply by 5 and then divide by 9. *Conversion of Celsius to Fahrenheit* — Multiply by 9, divide by 5 and then add 32.

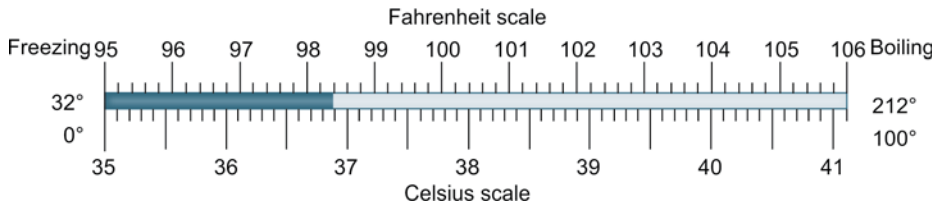


Fig. 8.1: Clinical thermometer

Fig. 8.2: Dipsticks (Uro-dip reagent Strips) for Urinalysis

Principle: Reagent strips are used for rapid determination of the following in Urine:

- Urobilinogen ➤ Glucose ➤ Bilirubin
- Ketones ➤ Specific gravity
- Blood ➤ PH ➤ Protein
- Nitrite ➤ Leukocytes and
- Ascorbic acid

Specimen Collection: Urine is collected in a clean dry container that allows all the test field of the strip to be completely immersed. Use of fresh morning specimen is commonly used.

Test Procedure: 1. Dip the strip into urine up to the test required, for no more than two seconds. 2. Turn the strip on its side and tap on a piece of tissue paper to remove any excess of urine. 3. To compare the colors of reagent pads within a minute with the color chart on the vial under good light keeping the strip horizontal to prevent any possible mixing of chemicals between the adjacent pads.

Results: Each color block gives a range of values. Positive result for nitrites suggests infection.



Fig. 8.2: Dipsticks (Uro-dip reagent Strips) for Urinalysis

OBSTETRIC INSTRUMENTS

Fig. 8.3: Rubber catheter

Description: It is made of rubber. It has different sizes. Slit openings are (usually two) there close to the tip one on either side for drainage of bladder.

Sterilization: Boiling

It is used to empty the bladder in cases with **retention of urine** during — (a) **Pregnancy** [Retroverted Gravid Uterus; (b) **labor** — (i) when the woman fails to pass urine by herself, (ii) before and after any operative interventions (forceps delivery p. 237, destructive operations p. 248); (c) **postpartum** — (i) during management of postpartum hemorrhage p. 93, retained placenta; (d) **other uses** — (i) as a tourniquet, (ii) to administer O₂ when nasal catheter is not available, (iii) as a mucus sucker — when it is attached to a mechanical or electric sucker.

Chapter Objectives

Basic knowledge and understanding of:

- Identification of the instrument
- Uses
- Related surgical procedures with its use (Obstetric)
- Complications out of its use (as applicable)

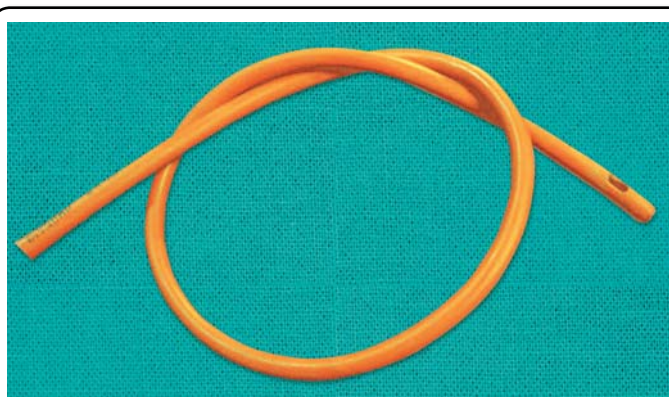


Fig. 8.3: Simple rubber catheter

Self assessment: (i) Length of female urethra (Dutta Obs 8/e, p 15), (ii) causes of retention of urine during pregnancy, labor and puerperium. (iii) Why a metal catheter is not used in obstetrics ?

Ans. To avoid trauma to the soft and vascular urethra.

Fig. 8.4: Foley's self retaining catheter

Description: It is made of silicon rubber. The catheter tip has two slit openings one on either side for drainage of urine. The other end goes to the urinary bag for collection of urine. The catheter has two channels within. One channel for drainage of urine and the other channel is used to push some water through it. Water inflates the catheter bulb that makes the catheter self-retaining. The bulb capacity is written on the catheter. The catheters are of different sizes. The commonly used sizes in female are 14F, 16F or 18F.

Sterilization: It is available in a sterile package following sterilization with Ethylene Tetra Oxide (ETO). It is disposable.

It is used for continuous drainage of bladder in cases with—(i) Eclampsia (p. 58), (ii) retroverted gravid uterus, (iii) To give rest to the bladder following any destructive operation and/or in a case with suspected bladder injury (p. 248). It is usually kept for 7–10 days, (iv) in the management of atonic PPH (p. 92), (v) to control atonic PPH. The catheter is inserted within the uterine cavity and the catheter balloon is inflated with normal saline. The balloon provides a tamponade (p. 94) to the uterine surface. The catheter drains the blood from the uterine cavity if there is any.

Selfassessment: (i) Indications of continuous bladder drainage (Dutta Obs 8/e, p 677, 362), (ii) Causes of atonic PPH (Dutta Obs 8/e, p 475).

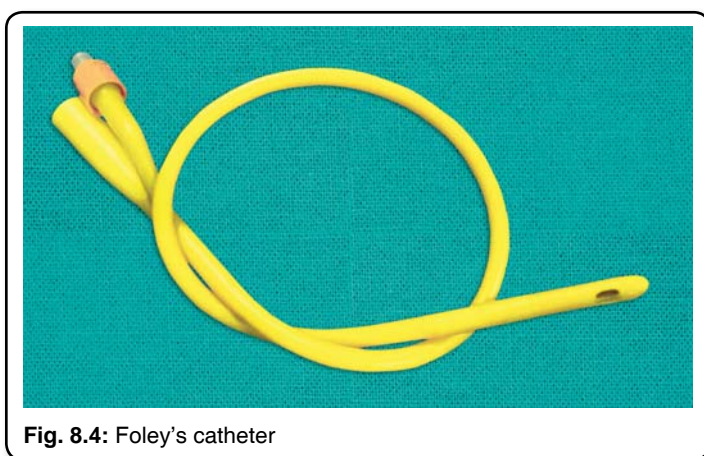


Fig. 8.4: Foley's catheter

Fig. 8.5: Sims' double-bladed posterior vaginal speculum

Description: This double bladed speculum has a groove in the handle (located in between the blades). This groove is in continuity at either end, with the concave inner surface of each blade. The purpose of the groove is to allow drainage of blood, urine (in case of aVVF), or secretions to collect such body fluid samples for tests.

Sterilization: Boiling or Autoclaving

The blades are of unequal breadth to facilitate introduction into the vagina depending upon the space available (narrow blade in nulliparous and the wider blade in parous women). It is used in obstetrics—(1) to inspect the cervix and vagina to detect any injury following delivery, (2) to clean the vagina following delivery, (3) to inspect the cervix and vagina to exclude any local cause for bleeding in APH (Cusco's speculum preferred), (4) during D and E operation (p. 231).

Selfassessment: (i) Common sites of traumatic PPH (Dutta Obs 8/e, p 475), (ii) diagnosis of traumatic PPH (Dutta Obs 8/e, p 479), (iii) indications of D + E (p. 231), (iv) what are the local (extra-placental) causes of APH (p. 85) (v) What is Sims' position and what is Sims' triad? (See section 2, p. 339).

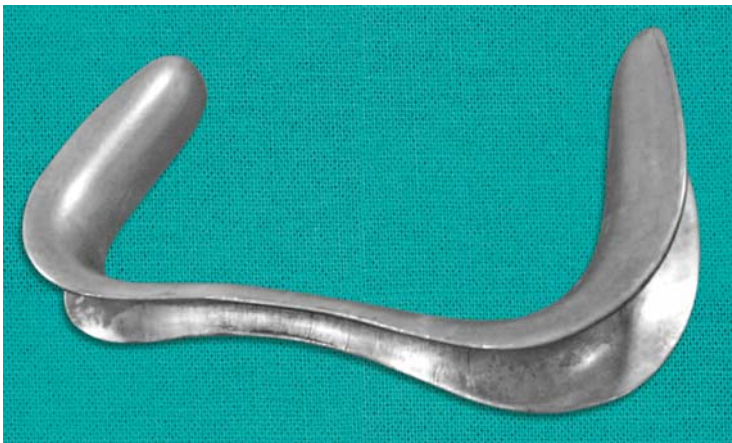


Fig. 8.5: Sims' double-bladed posterior vaginal speculum

Fig. 8.6: Cusco's Bivalve, Metallic, Self-retaining, Adjustable, Vaginal Speculum

Description: It has two blades joined by screws that allow the blades to open and close around a transverse axis. The blades are concave inside. The handle is designed to open and close the blades and to adjust the space with the blades with a separate rod and screw system. This also makes the blades self-retaining during examination. This speculum does not need any assistant to hold it.

Sterilization: Boiling or Autoclaving

Uses: (i) To visualize the cervix and vaginal fornices for any local cause (polyp and ectopy) of APH, (ii) To inspect the cervix and to prepare cervical smear for cytology screening, (iii) to detect leakage of liquor from the cervical os in a case of suspected PROM (Dutta Obs 8/e, p 369).

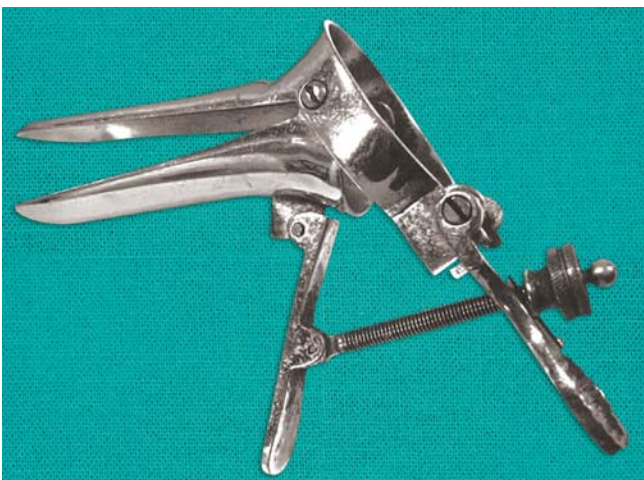


Fig. 8.6: Cusco's bivalve self-retaining vaginal speculum

Fig. 8.7: Multiple toothed vulsellum

Description: It is a long metallic instrument having the handle at one end with a catch. The other end has teeth (3-4) which bite the tissue when grasped to have a fixed grip. The instrument has a smooth curvature which allows good vision of the tip while working at a depth.

Sterilization: Boiling or autoclaving

It is used to catch hold the anterior lip of the cervix in D + E operation, suction evacuation (p. 231). As it produces trauma to the soft and vascular cervix, Allis tissue forceps is used instead.



Fig. 8.7: Multiple toothed vulsellum

Fig. 8.8: Allis tissue forceps

Description: It is a metallic instrument having two ends. One end is the handle with the provision of ratchet and catch. The other end has the arrangement of multiple teeth (4-6). The blades allow some space within in locked position so that the tissue hold is not crushed. This forceps may be of different sizes.

Uses: (i) To catch hold of the anterior lip of the cervix in D + E operation, (ii) to hold the apex of the episiotomy wound during repair, (iii) to catch hold of the margins of the peritoneum, rectus sheath, vaginal mucosa during repair, (iv) to catch hold of the torn ends of the sphincter ani externus prior to suture in repair of complete perineal tear, (v) to catch hold the margins and angles of the uterine flaps in LSCS after the delivery of the baby as an alternative to Green-Armytage hemostatic clamp.

Self-assessment: (i) **Episiotomy** — see p 234, (ii) what are the obstetric causes of perineal tear [p. 345 (Section 2)] (iii) what are the different degrees of perineal tear (p. 345)? (iv) when and how a recent perineal tear is repaired? (Section 2, p 345)

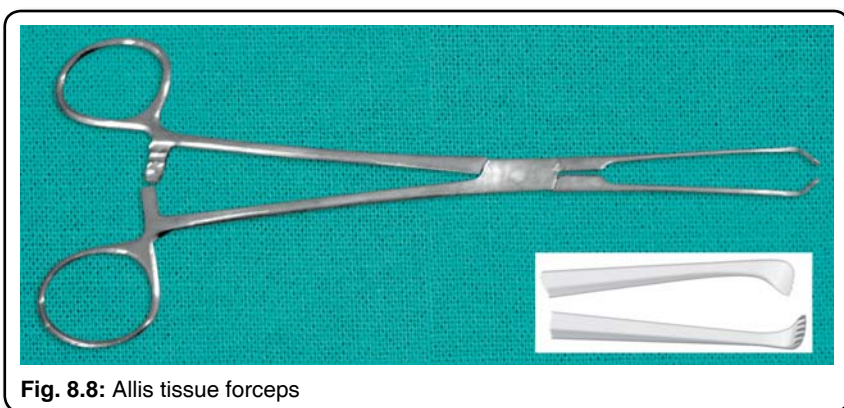


Fig. 8.8: Allis tissue forceps

Fig. 8.9: Little Wood's Forceps

Description: It is a metallic instrument used to hold tissues. The design is similar to that of Allis tissue forceps except that the blades are curved with concavity inwards. Uses are similar to that of Allis tissue forceps.

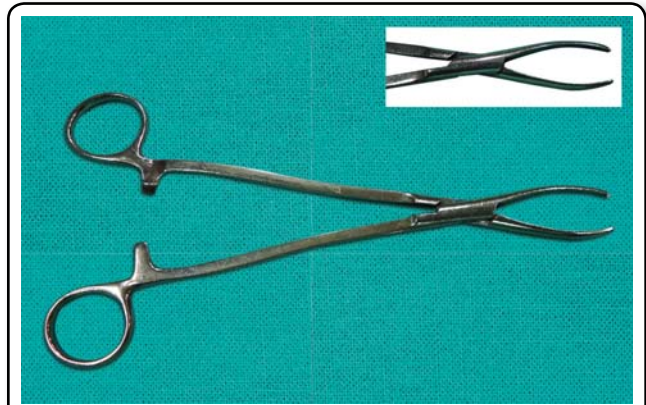


Fig. 8.9: Little wood's forceps

Fig. 8.10: Long straight hemostatic forceps

Description: It is a long metallic instrument. It has a handle at one end provided with a ratchet and catch. The blades, on the other side, are having transverse serrations on the inner surface. Spencer wells variety either straight or curved are commonly used.

Use: This is not commonly used in obstetrics. It can be used to clamp the pedicle while removing the uterus as in rupture uterus. The umbilical cord may be clamped as an alternative to Kocher's.

Self assessment: (i) What are the causes of rupture uterus (See p. 274)? (ii) How to suspect scar dehiscence (p. 37)?, (iii) How a case of rupture uterus is managed (p. 274)?.

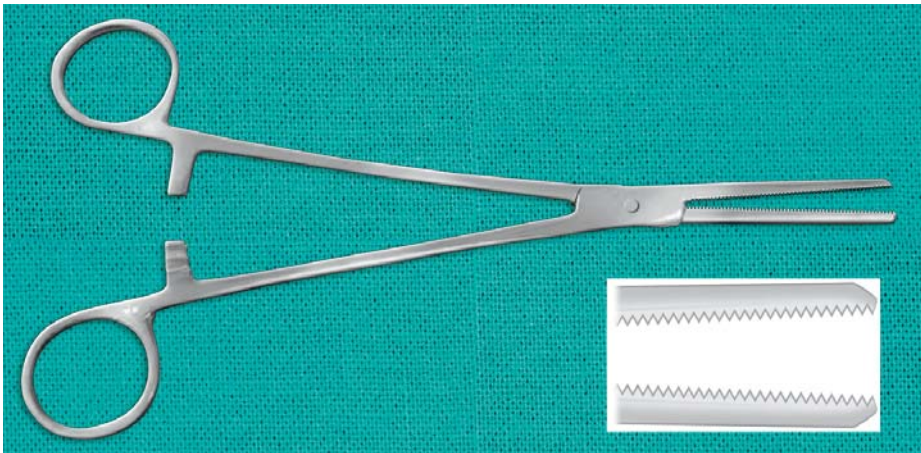


Fig. 8.10: Long straight hemostatic forceps

Fig. 8.11: Kocher's hemostatic forceps

Description: It is a long metallic instrument having handle (racket and catch) at one end and the tissue holding blades are on the other end. This instrument has a tooth at the tip of one blade and a corresponding groove on the other blade. This names the instrument is used to hold tissues (umbilical cord) firmly when locked and the risk of slipping is negligible.

Sterilization: Boiling or autoclaving

Uses: (i) To clamp the umbilical cord/for better grip and effective crushing effect to occlude the vessels, (ii) in low rupture of the membranes as surgical induction of labor or augmentation of labor.

Self-assessment: (i) Structures of umbilical cord (Dutta Obs 8/e, p 44), (ii) significance of single umbilical artery (Dutta Obs 8/e, p 254), (iii) indications of induction of labor (Dutta Obs 8/e, p 598), (iv) indications of surgical induction of labor (Dutta Obs 8/e, p 601), (v) dangers of induction of labor [medical and surgical (Dutta Obs 8/e, p 601)], (vi) what is the preinduction cervical scoring system (Dutta Obs 8/e, p 600)? (vii) what immediate attention we should pay following ARM (Dutta Obs 8/e, p 602)?

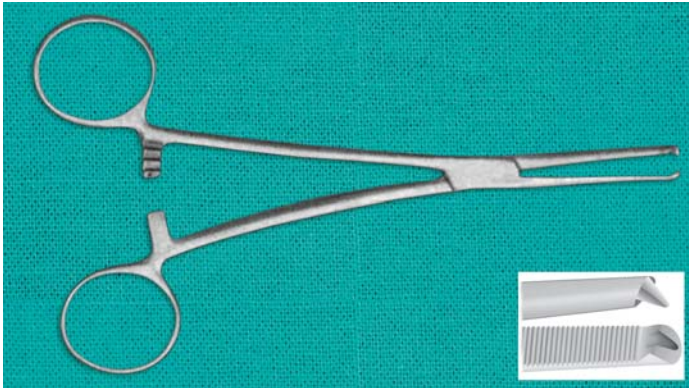


Fig. 8.11: Kocher's hemostatic forceps

Fig. 8.12: Long straight scissors

Uses: It is commonly used to cut the (i) umbilical cord, (ii) to make episiotomy (iii) to cut suture materials as in cesarean section.

Self-assessment:

(i) When should the umbilical cord be clamped and cut (p. 183)? (ii) What are the indications of early cord clamping and cutting? (iii) At what distance from the umbilicus the cord is clamped and cut?

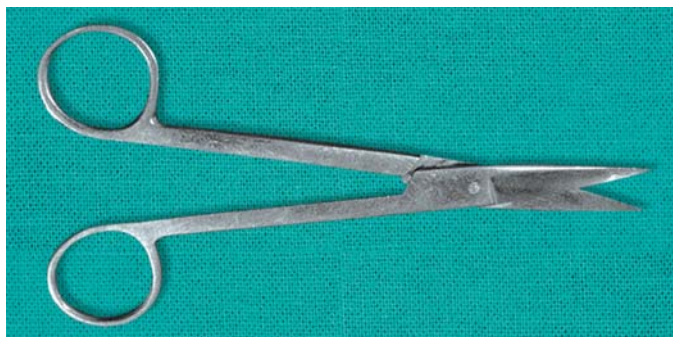


Fig. 8.12: Long straight scissors

Fig. 8.13: Uterine sound

It is an olive pointed, graduated, malleable, metallic uterine sound. **Uses:** (i) To know the position (ante or retroversion) of the uterus and the length of the uterocervical canal prior to dilatation of the cervix in D + E operation, (ii) to sound the uterine cavity to detect any foreign body (IUCD), (iii) It acts as a first dilator of the cervical canal.

Self assessment: (i) What are the instruments required for D + E or suction evacuation (p. 231, 232.)? (ii) What are the important steps of S + E or D + E (p. 231-2.)? (iii) what are the complications of S + E or D + E operation (see p 232)?



Fig. 8.13: Uterine sound

Fig. 8.14: Cervical dilators: Hawkin-Ambler (Fig. 8.14A) and Das or Hegar's Dilators (8.14B)

Hawkin Ambler: It is a single ended metallic cervical dilator. The disc shaped end is the handle and the other pointed side, is the dilating end. It has a smooth curvature with the tip directing upwards to follow the anteversion and anteflexion of the uterus.

Sterilization: Boiling or Autoclaving

It has got 16 sizes, the smallest one being 3/6 and the largest one being 18/21. The number is arbitrary in the scale of Hawkin-Ambler. The smaller one denotes measurement at the tip and the larger one measures the maximum diameter at the base in mm.

Das or Hegar's dilators: Description: This double ended metallic dilator with a S shaped curvature. The minimum size is 1/2 and the maximum size is 11/12. The number represents the diameter in mm. Both the sides are used with the lower number first.

Use: It is used in dilatation of the cervical canal prior to evacuation operation. Das/ Hegar's Dilators, both are functionally the same.



Fig. 8.14: Cervical dilators: (A) Hawkin-Ambler and (B) Das / Hegar's dilator

Degree of dilatation required: (i) Incomplete abortion — sufficient to introduce the index finger (usually 16/19), (ii) in suction evacuation — one size smaller than the size of the suction cannula, (iii) in MTP by D + E — sufficient dilatation to introduce ovum forceps (usually 9/12).

Self-assessment: (i) How to know the end point of suction procedure (p. 232)? (ii) What is the management protocol when there is uterine perforation (p. 231)? (iii) What are the indications of laparotomy following perforation?

Ans. Laparoscopy is helpful to assess the situation, (i) lateral uterine wall injury with intraperitoneal hemorrhage or broad ligament hematoma, (ii) suspected injury to bowel and/or omentum, (iii) deterioration of vital signs during the period of observation, (iv) perforation prior to complete evacuation.

Fig. 8.15: Flushing curette

Description: It is a long metallic instrument with a channel inside. The stout end is used as the handle and the other end is spoon shaped and fenestrated. This end is used as the blunt curette. The channel present inside the curette was designed to flush the endometrial cavity with antiseptic solution. Currently flushing system is not used. It is a blunt curette used in the operation of D + E. Previously, it was used to flush the uterine cavity with lukewarm antiseptic solution— passing through the communicating channel.

Self-assessment: Questions are similar as in Figs 8.13 and 8.14.



Fig. 8.15: Flushing curette

Fig. 8.16: Doyen's retractor

Description: It is long metallic instrument. It has a stout handle at one end. The other end has a wide retracting blade (fan shaped and curved) . It needs an assistant to hold the instrument.

Sterilization: Boiling or autoclaving

Uses: It is used to retract the abdominal wall as well as the bladder for proper exposure of lower uterine segment during LSCS. It is to be introduced after opening the abdomen; to be temporarily taken off while the baby is delivered, to be reintroduced after delivery of the baby and finally to be removed after toileting the peritoneal cavity.

Self-assessment: (i) Types of CS (Dutta Obs 8/e, p 671) (ii) Common indications of LSCS (p. 242), (iii) Principal steps of LSCS (p 242) (iv) merits and demerits of LSCS over classical (Dutta Obs 8/e, p 676 Table 37.4), (v) complications of CS (p. 242), (vi) measures to reduce caesarean delivery (Dutta Obs 8/e, p 679).



Fig. 8.16: Doyen's retractor

Fig. 8.17: Sponge holding forceps

Description: It is a long metallic (steel) instrument. It has two ends—(1) One end is the handle with ratchet and catch. (2) The other end is ring shaped with transverse serration inside for better grip.

Sterilization: Boiling or Autoclaving

Uses: (i) Toileting the vulva, vagina and perineum prior to and following delivery. (ii) antiseptic painting of the abdominal wall prior to cesarean section, (iii) to catch hold the membranes if it threatens to tear during delivery of the placenta, (iv) to catch hold the cervix (2 pairs are needed) for inspection in suspected cervical tear, (v) to catch hold the cervix during encirclage operation.

Self-assessment: (i) What antiseptic solutions are commonly used to clean the vulva and vagina prior to and following delivery (p. 231)?, (ii) how the antiseptic painting of the abdominal wall is done before CS and what antiseptic solution is commonly used (p. 243)? (iii) what happens if bits of placental tissue or membranes are left behind (Dutta Obs 8/e, p 483)? (iv) how a cervical tear is repaired (Dutta Obs 8/e, p 492 Fig. 29.2)?

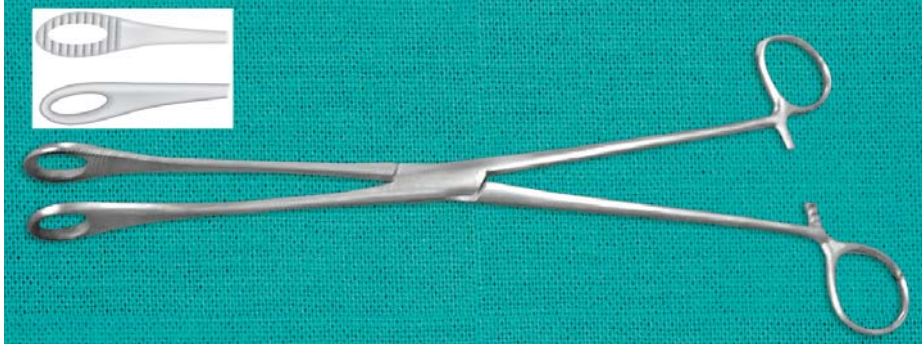


Fig. 8.17: Sponge holding forceps

Fig. 8.18: Ovum forceps

Description: It is a long metallic (steel) instrument with two ends and a shaft. The handle has no catch. For this reason risk of crushing any tissue, if it is grasped inadvertently, is less. The fenestrated end has no serrations inside. This way ovum forceps differs from a sponge holding forceps.

Sterilization: Autoclaving or Boiling

It has got no catch and the blades are slightly bent and fenestrated. Absence of catch minimizes uterine injury, if accidentally caught. It prevents crushing of the conceptus. It is to be introduced with the blades closed, to open up inside the uterine cavity, to grasp the products and to take out the instrument with a slight rotatory movement. The rotatory movements not only facilitate detachment of the products from the uterine wall but also minimize the injury of the uterine wall, if accidentally grasped.

Self-assessment: (i) How to differentiate it from a sponge holding forceps, (ii) How the absence of catch made it advantageous (See above)?, (iii) What are the indications of its use?

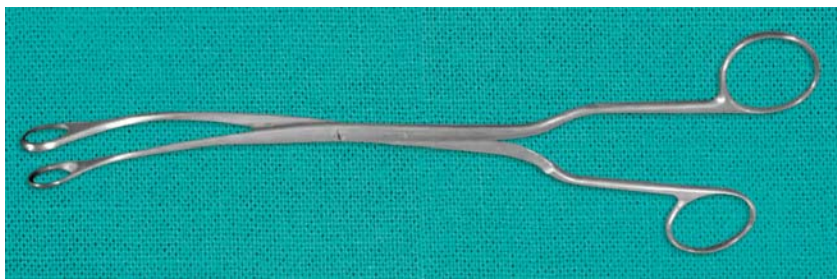


Fig. 8.18: Ovum forceps

Fig. 8.19: Uterine curette

Description: It is a long metallic instrument with a small fenestrated end at each side and a shaft in between. The shaft is used as the handle. The edge of the fenestration is sharp at one end and on the other end it is blunt. The blunt and the sharp edges are directed in opposite direction.

Sterilization: Boiling or autoclaving.

It may be sharp at both ends or sharp at one end and blunt at the other. Its common use in obstetrics is in the operation of D + C for incomplete abortion. In D + E operation, the curettage is done by blunt curette as the uterine wall is very soft. It can also be used in D + C operation 1 week following evacuation of hydatidiform mole.

Self-assessment: (i) Questions as in Figs. 8.13, 8.14, 8.15, 8.17, 8.18, (ii) place of curettage following evacuation of hydatidiform mole (Dutta Obs 8/e, p 227), (iii) drawbacks of vigorous curettage, (iv) what is post abortion care (Dutta Obs 8/e, p 643)?



Fig. 8.19: Uterine curette

Fig. 8.20: Uterine dressing forceps

It is a long metallic instrument with a handle with racket and catches at one end and the transversely serrated long blades at the other end. The instrument has a smooth S shaped curve designed to accommodate the blades within the uterine cavity.

Sterilization: Boiling or autoclaving

The instrument is most often confused with laminaria tent introducing forceps. The blades are transversely serrated while in the latter, there is a groove on either blade.

Uses: (i) To swab the uterine cavity following D + E with small gauze pieces (ii) to dilate the cervix in lochiometra or pyometra.

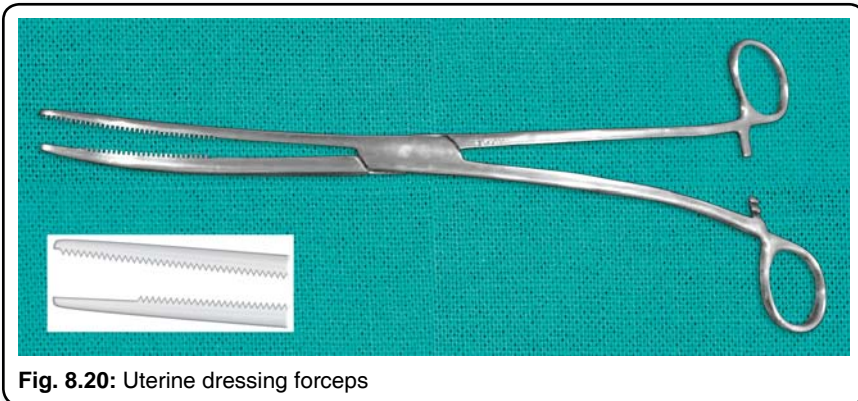


Fig. 8.20: Uterine dressing forceps

Fig. 8.21: Laminaria tent and the tent introducing forceps with laminaria tent

The instrument is almost similar to uterine dressing forceps. There is a groove on either blade to catch the laminaria tent.

Laminaria tent: It is dehydrated, compressed, Chinese sea-weeds. It is sterilised by keeping it in absolute alcohol at least for 24 hours. Usually more than one tents are to be introduced to prevent dumbing of the ends. It produces slow dilatation of the cervical canal, as it swells up due to hygroscopic action (Dutta Obs 8/e, p 371).

Isabgul tents (Isogel): It is dried granules prepared from the husks of “certain mucilaginous tropical seeds”.

Self assessment: (i) Steps of introduction of tents (Dutta Obs 8/e, p 643) and (ii) What are the other alternatives of tent used for slow dilatation of the cervix (see above)?

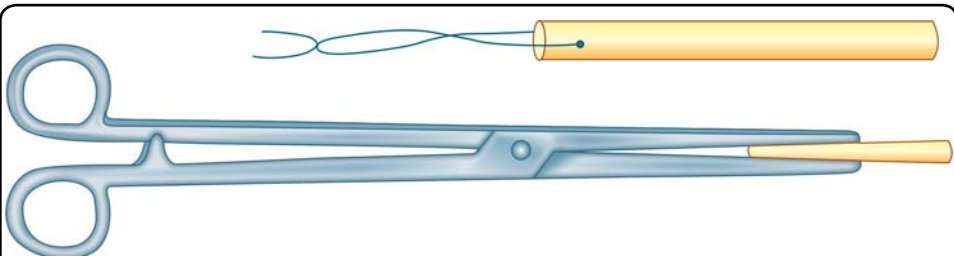


Fig. 8.21: Laminaria tent and the tent introducing forceps with laminaria tent

Figs 8.22 to 8.24: Manual vacuum aspiration (MVA) syringe

Use: This is used for evacuation of the uterus (MTP) by creating a vacuum. It is used upto 12 weeks of pregnancy (Dutta Obs 8/e, p 646).

Other uses: Evacuation of the uterus in cases — (i) Menstrual regulation, (ii) incomplete/missed abortion (up to 12 weeks), (iii) molar pregnancy (upto 12 weeks), (iv) blighted ovum (p. 97), (v) Endometrial sampling / biopsy.

Advantages of MVA: (i) It is simple, (ii) safe, (iii) can be done as an outpatient basis (without electricity), (iv) with local anesthesia, (v) effective (98%), (vi) less traumatic and (vii) it takes less time (10–15 minutes).

Selfassessment: (i) Methods of termination of pregnancy in the first trimester (Dutta Obs 8/e, p 203), (ii) complications of MVA (p. 232), (iii) how one can ensure that the procedure is completed (p. 232), (iv) what are the precautions that we should take (p. 232)?

Parts of MVA syringe (Fig. 8.23): (i) Cylinder, (ii) hinged valve (valve liner inside), (iii) valve cap, (iv) valve button, (v) plunger with handle, (vi) collar stop, (vii) cannula—dimensions and sizes are similar to Karman's (see below) (Fig. 8.25). The winged adaptor is fixed at the base (Fig. 8.24).

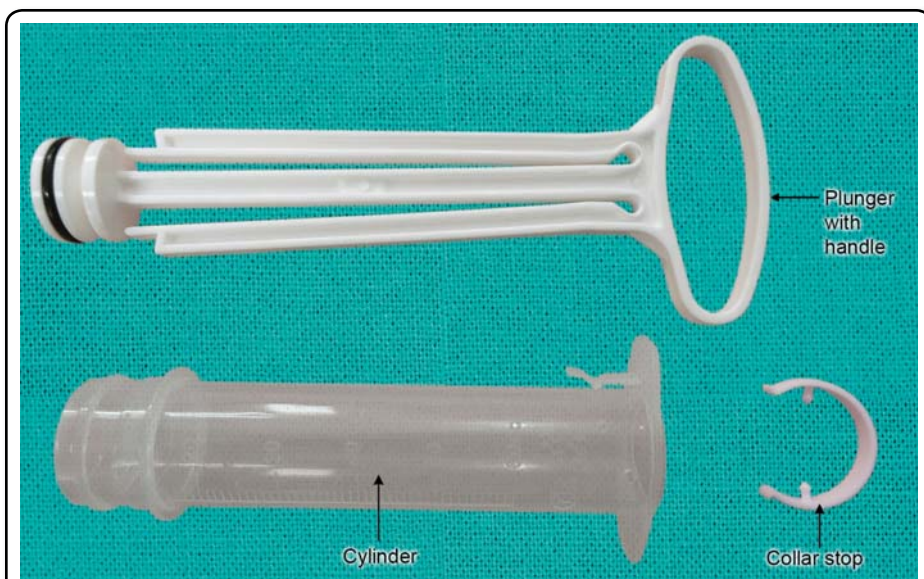
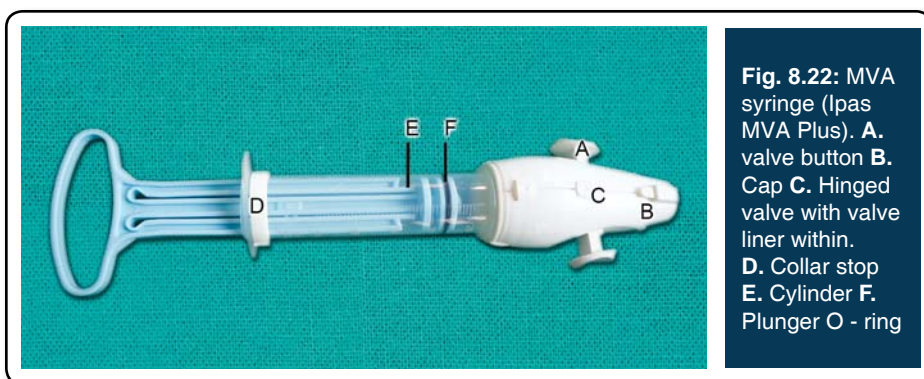


Fig. 8.23: Parts of MVA syringe



Fig. 8.24: Valve cup and valve liner

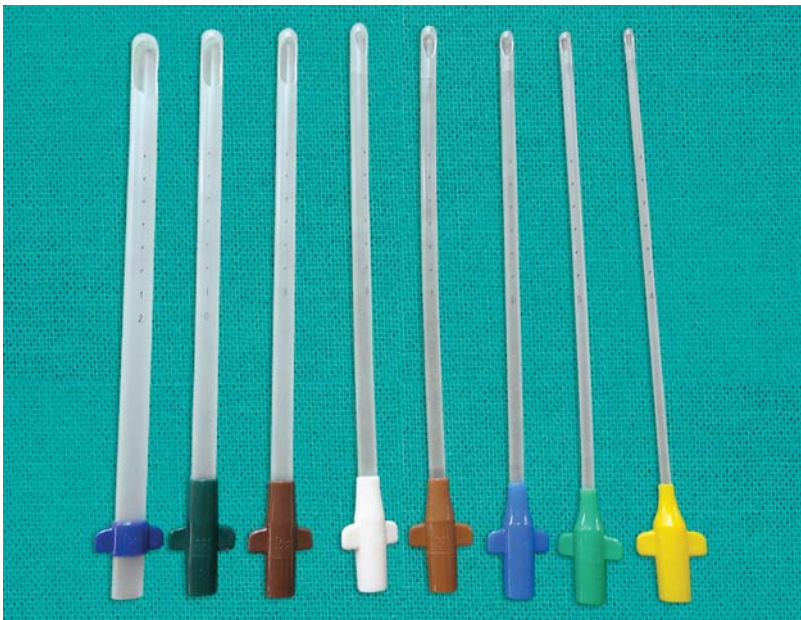


Fig. 8.25: MVA—cannulas of different sizes; the winged adaptor

Fig. 8.25: Plastic suction cannula (Karman's type)

It is of different sizes and the approximate size required for a particular case equals to the weeks of pregnancy to be terminated. The plastic cannula has got advantages over the metallic one — as it causes less damage to the uterine wall and the product sucked out is visible. **The vacuum must be broken before its withdrawal.** It is of different sizes (4, 5, 6, 7, 8, 9, 10, and 12 mm). It is used for S + E and MVA.

Self assessment: (i) How is the size of the cannula determined?, (ii) during S + E procedure, how is the cannula to be moved?, (iii) how much suction pressure is generally used (p. 231)?

Fig. 8.26: Operation trolley for suction and evacuation



Fig. 8.26: Operation trolley for suction and evacuation

1. Towels for drapings, 2. Kidney dish with sterile gauze pieces, 3. Towel clip, 4. Bowl with povidone iodine, 5. Suction tube, 6. Sponge holding forceps, 7. Sim's vaginal speculum, 8. Uterine sound, 9. Suction cannulas (3), 10. Cervical dilaters (Hegar's), 11. Uterine curette (sharp and blunt), 12. Multiple toothed vulsellum, 13. Uterine dressing Forceps, 14. Ovum forceps (2)

Fig. 8.27: Long curved obstetric forceps

It is commonly used in low forceps operation.

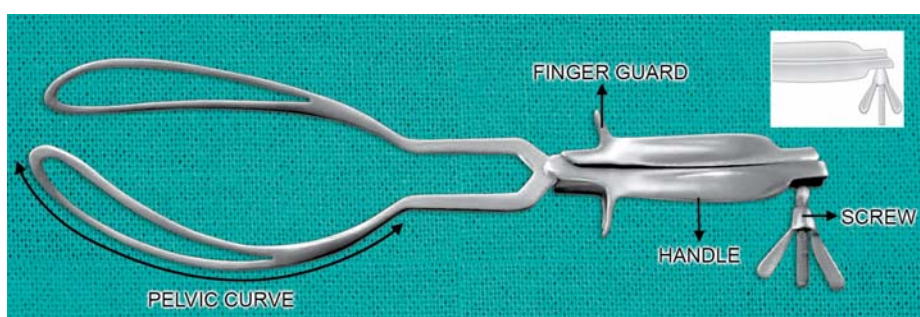


Fig. 8.27: Long-curved obstetric forceps

Self assessment:**Q. What are the different types of obstetric forceps?**

- Ans.** 1. Long curved obstetric forceps with or without axis traction during (Fig. 8.27)
2. Short curved forceps (Fig. 8.28)
3. Kielland's forceps (Fig. 8.29)

Q. What are the different parts and the curvatures?**Ans. 1. Parts of forceps:**

- Blades—two (right and left)
- Shank
- Lock
- Handle

2. Curvatures:

- Pelvic curve—curve on the edge
- Cephalic curve—curve on the flat surface

Q. How do you identify the blades?

- Ans.** 1. The tip of blade should point upwards
2. Cephalic curve is to be directed inwards
3. Pelvic curve is to be directed forwards

Q. What are the different types of forceps application?

- Ans.** 1. **Outlet forceps:** Fetal skull; at pelvic floor, sagittal suture is in antero-posterior diameter of the pelvis
2. **Low forceps:** Station is at +2 or more
3. **Mid forceps:** Head is engaged but station is above +2 cm
4. **High forceps (abandoned):** Head is not engaged

Q. What are the functions of the obstetric forceps?

- Ans.** 1. Traction (20 kg in primigravida, 13 kg in multi)
2. Rotation of the head
3. Protective cage for the head
4. Controlled delivery of the aftercoming head of breech
5. One blade may be used as a vectis during cesarean section

Q. What are the common indications of forceps delivery?

- Ans.** 1. Poor expulsive efforts of the mother (maternal distress)
2. Fetal distress in second stage of labor
3. Prolonged second stage of labor
4. To cut start the second stage of labor

Q. Conditions to be fulfilled before applications of forceps.

- Ans.** 1. Head must be engaged
2. Cervix must be fully dilated
3. Membranes must be ruptured
4. Pelvis must be adequate
5. Bladder must be emptied
6. Adequate analgesia
7. Informed consent (written or verbal)

Q. What are the steps of forceps application?

- Ans.**
1. Identification of the blades
 2. Introduction of left blade first
 3. Introduction of right blades
 4. Locking of the blades
 5. Traction
 6. Delivery of the head of the baby
 7. Removal of the blades
 8. Delivery of the baby

Q. What is the direction of pull during delivery?

- Ans. Direction:** Straight horizontal then upwards and forwards. Downwards and backwards → the straight pull → finally upwards and forwards.

A. **Outlet forceps delivery**

B. **Low forceps delivery**

Q. What are the difficulties in forceps delivery?

- Ans.** Difficulties may be—

- A. During application of the blades due to:
 - a. Incompletely dilated cervix or (b) unrotated head or (c) non-engaged head.
- B. During locking of blades due to:
 - a. Unrotated head
- C. During traction due to
 - a. Undiagnosed occiput posterior

Q. What is prophylactic forceps?

- Ans.** When forceps are applied to shorten the second stage of labor in anticipation to some complications either to mother or to the fetus.
Indications are: (i) Eclampsia, (ii) fetal growth restriction (FGR).

Q. What is trial forceps?

- Ans.** It is a tentative attempt of forceps delivery in a case with suspected midpelvic contraction with a preamble declaration that the procedure may be abandoned, if moderate force fails to deliver the baby. In that case baby is delivered by immediate cesarean section. The trial of forceps delivery is conducted in an operation theater keeping everything ready for cesarean section so that no time is wasted to deliver the baby. It has the advantage of reducing many unnecessary cesarean sections.

Q. What is failed forceps?

- Ans.** When there is failure of forceps delivery in spite of deliberate attempt to deliver the baby. Common reasons are:
- a. Incompletely dilated cervix
 - b. Cephalopelvic disproportion
 - c. Unrotated head.

Fig. 8.28: Short curved obstetric forceps (Wrigley's forceps)

It can only be used as outlet forceps for extraction of the head.

Self assessment: (i) Difference with long curved forceps (Dutta Obs 8/e, p 651), (ii) define outlet forceps (p. 265), (iii) what is the direction of pull (p. 238)?.

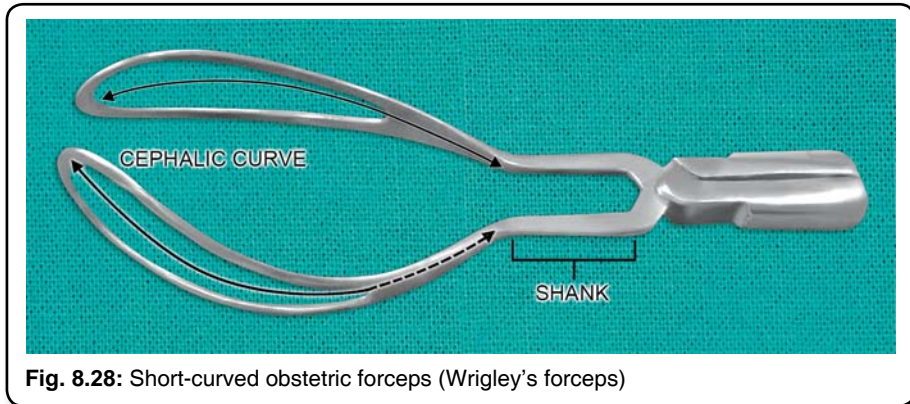


Fig. 8.28: Short-curved obstetric forceps (Wrigley's forceps)

Fig. 8.29: Kielland's forceps

It is usually used as rotation forceps in deep transverse arrest of occipitoposterior position of the head or in unrotated vertex or face presentation.

Self assessment: (i) Identification of blades (p. 265), (ii) special advantages over the long-curved forceps (see below), (iii) methods of application, (iv) hazards of its use (see below).

Ans: Advantages over long curved forceps are—(i) This can be used in unrotated (ii) Facilitates grasping the head with correction of asynclitism.

Complications are: (A) Fetal: Facial injury—bruising or laceration, skull fracture, intra-cranial hemorrhage (B) Maternal: Perineal injury: sulcus tear, vaginal laceration

Methods of application are: (a) wandering method (superior blade first). It is commonly done (b) Direct method or the (c) Classical method.



Fig. 8.29: Kielland's forceps

Fig. 8.30: Forceps' axis traction devices

It includes axis traction rods (right and left) and handle. The rods are assembled in the blades of long-curved obstetric forceps prior to introduction and lastly the handle is attached to the rods. The devices are required where much forces are necessary for traction as in midforceps operation. These are less commonly used now.

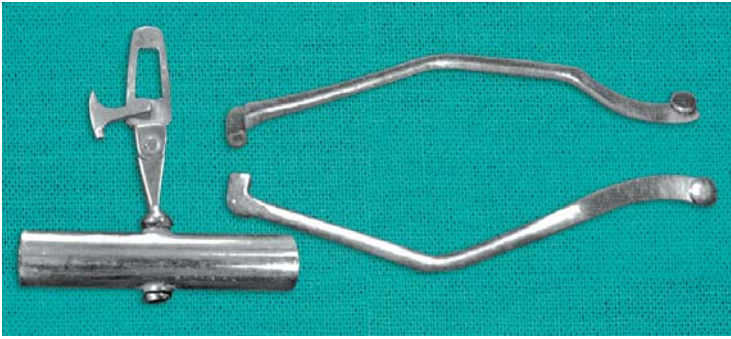


Fig. 8.30: Forceps' axis traction devices

Advantages are: Axis traction devices are used in mid greens delivery and in cases following manual rotation of the head. It provides traction in the correct axis of the pelvic curve. Less force is needed to deliver the head.

Self assessment: (i) Identification of traction rods and (ii) indications of use (Dutta Obs 8/e, p 653).

Fig. 8.31: Episiotomy scissors

It is bent on edge. The blade with blunt tip goes inside the vagina. This is designed to avoid trauma to the baby while making the perineotomy (incision).

Self assessment: Common indications of episiotomy (p. 234), (ii) should episiotomy be made in all cases?, (iii) types of episiotomy (p. 234), (iv) structures cut (p. 234) and (v) complications of episiotomy (p. 234).

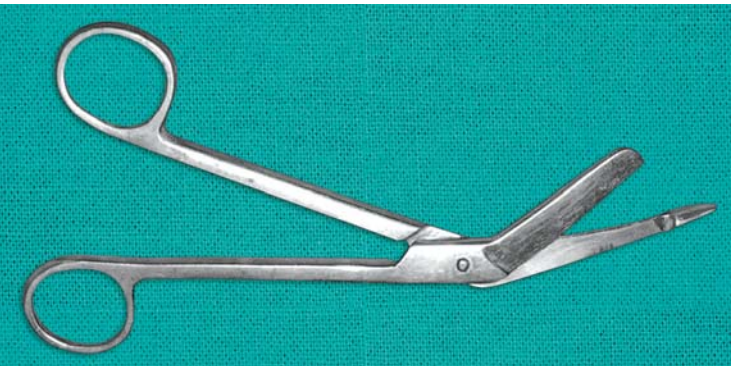


Fig. 8.31: Episiotomy scissors

Fig. 8.32: Ventouse cup with traction device

Use: It is used in the operation of vacuum extraction of the head. The cup is to be fitted to the scalp of the forecoming head by producing “chignon” with the help of vacuum. The cup has got various sizes (see p 241 Fig. 8.32).

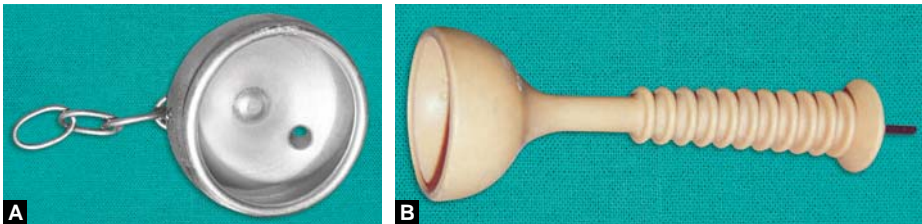


Fig. 8.32: Ventouse cup (A) Metal and (B) Silastic

Self assessment: (i) Indications of its use, (ii) Advantages over forceps (see p 241), (iii) Conditions to be fulfilled for its application, (iv) Methods of its use, (v) Hazards of ventouse delivery, (vi) Advantages of a silastic cup over the metallic one. **Ans.** Silastic cups are soft, can be molded, and causes less trauma, and (vii) What is flexion point? **Ans.** (see p 241).

Fig. 8.33: Green armytage hemostatic forceps

Description: It is a long metallic instrument. Handle is at the one end with ratchet and catch. The other end is the tissue holding broad end. This end has got transverse serrations. **Uses:** This forceps is used in lower segment cesarean section. Total four forceps are ordinarily required — one for each angle and one for each flap. Its functions are hemostasis and to catch hold of the margins so that they are not missed during suture. It cannot be used in classical cesarean section. Alternative to this Allis tissue forceps may be used.



Fig. 8.33: Green armytage hemostatic forceps

Self assessment: (i) Factors for rise in CS rate (Dutta Obs 8/e, p 669), (ii) methods of suturing the uterine wound (see p 242, 247), (iii) criteria for VBAC (see p 39, 219), (iv) intraoperative complications of CS (see p 242).

Figs 8.34A and B: Mucus Sucker

(A) Disposable, (B) metal — It is used to suck out the mucus from the naso-opharynx following delivery of the head of the baby. To be of value, the mucus should be sucked prior to the attempt of respiration, otherwise the tracheobronchial tree may be occluded leading to inadequate pulmonary aeration and development of asphyxia neonatorum. The metal sucker requires a **sterile simple rubber catheter** to be fitted at one end and a sterile piece of gauze to the other end. Currently electric or the disposable sucker is being used.



Fig. 8.34A: Mucus sucker — Disposable



Fig. 8.34B: Mucus sucker — Metal

Self assessment: (i) Immediate care of the newborn (p. 183), (ii) management of the cord round the neck (iii) causes of asphyxia neonatorum (Dutta Obs 8/e, p 542), (iv) how Apgar Scoring is done (p. 183)? and (v) How do you manage an asphyxiated neonate (Dutta Obs 8/e, p 544)?

Fig. 8.35: Cord-Clamp (Disposable)

It is made of plastic and is supplied in a sterile pack. The serrated surface and the lock make its grip firm. It occludes the umbilical vessels effectively. The cord-clamp is to be kept in place until it falls off together with the detached stump of umbilical cord.

Self assessment (See also Fig. 8.35): (i) What is the purpose of the cord-clamp that is applied on the maternal end (p. 183)? (ii) What are the different abnormalities of cord attachment (Dutta Obs 8/e, p 253)? (iii) What is the significance when the cord is unduly long or short (Dutta Obs 8/e, p 253)?

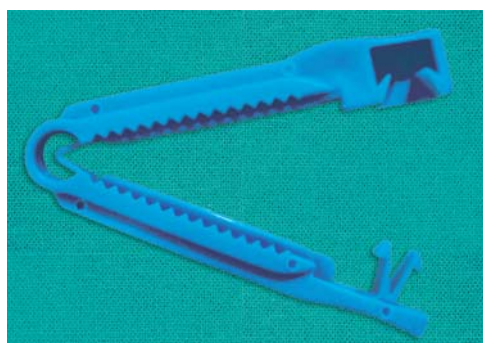


Fig. 8.35: Cord-clamp (disposable)

Fig. 8.36: Pinard's stethoscope

Use: It should be held firmly at right angle to the point on the abdominal wall. The ear must be firmly closed to the aural end. **It should not be touched by hand while listening.**

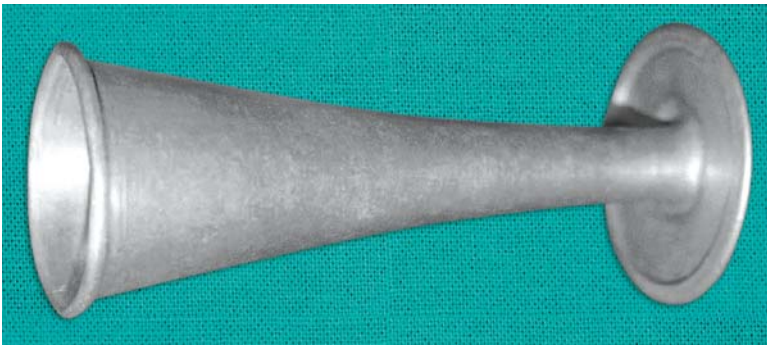


Fig. 8.36: Pinard's stethoscope

Self assessment: (i) Earliest at what weeks, FHS could be detected with a stethoscope (p. 281)?, (ii) what are the different sites where maximum intensity of FHS is obtained in relation to fetal presentation and position (p. 20)?, (iii) what are the clinical conditions where FHS may not be audible Ans. Maternal obesity, Hydramnios, occiput posterior position.

Fig. 8.37: Perforator (Oldham's)

The instrument is required in craniotomy to perforate the skull bone for decompression of the fetal head.

Self assessment: (i) Indications of craniotomy (p. 248), (ii) contraindications of craniotomy (p. 248), (iii) conditions to be fulfilled prior to craniotomy (Dutta Obs 8/e, p 666), (iv) what specific postoperative care is essential in such a case (p. 248)?, (v) important steps of the operation (p. 248), (vi) procedure to do after delivery of the placenta (p. 248) and (vii) complications of destructive operations (p. 248).

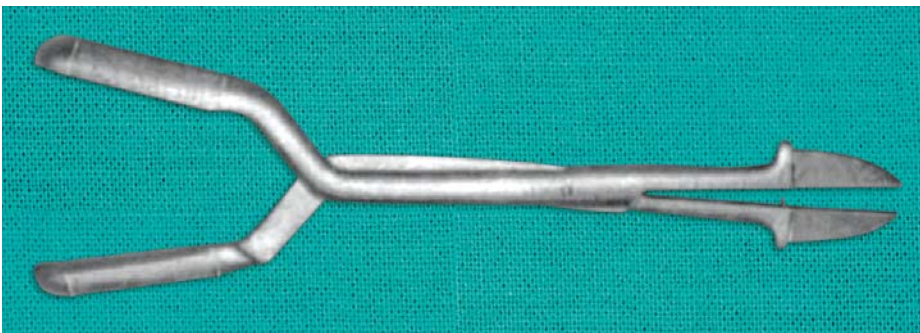


Fig. 8.37: Perforator (Oldham's)

Fig. 8.38: Giant vulsellum

It is used in destructive operation specially in evisceration to have a good grip of the fetal parts for giving traction.

Self assessment: (i) Indications of use, (ii) what is meant by neglected shoulder presentation (Dutta Obs 8/e, p 457)? and (iii) mention the postoperative care following any destructive operation (see p 248).

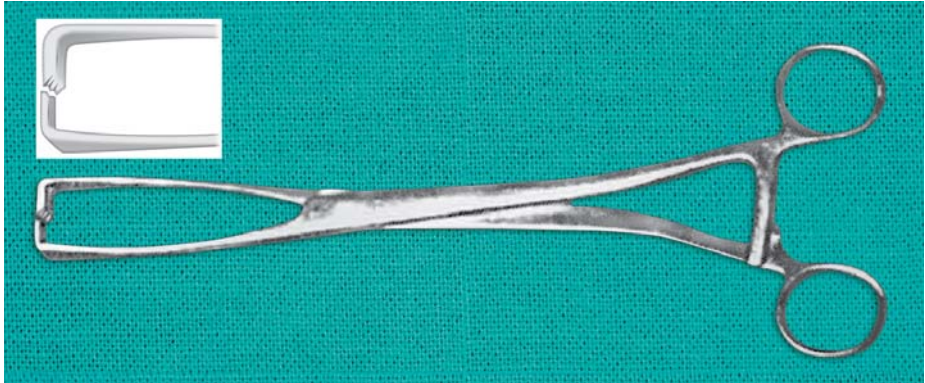


Fig. 8.38: Giant vulsellum

PROCESSING OF INSTRUMENTS

A. Disinfection is done by any one of the methods: Immersing instruments in (i) boiling water for 20 minutes, (ii) 2% glutaraldehyde (cidex) solution for 20 minutes or, (iii) 0.5% chlorine solution for 20 minutes (0.5% of chlorine solution is made by adding 3 teaspoons (15 gm) of bleaching powder in 1 liter of water)

B. Cleaning: Instruments are disassembled and washed on all surfaces in running (*preferably warm*) water. The cannulas should be flushed repeatedly

C. Sterilization: Either by, (i) autoclaving at 121°C (250°F), under pressure of 15 lbs/in² (106 kPa) for 30 minutes or, (ii) immersing in 2% glutaraldehyde (cidex) solution for 10 hours. All metallic instruments are sterilized by autoclaving or boiling. Rubber goods (Catheters) are sterilized by boiling.

SPECIMENS

- **Normal Placenta and Placenta Succenturiata**
- **Rupture Uterus**
- **Unruptured Tubal Ectopic Pregnancy**

Chapter Objectives

Good knowledge and understanding of:

- Macroscopic description of the organ(s) with associated pathology
- Surgical procedures done in relation to such pathology
- Obstetric (Maternal and fetal) complications related to this pathology
- Expected histopathology
- Management options
- Follow up management

Fig. 8.39: Normal placenta and placenta succenturiata

Photographs showing maternal surface of a normal placenta (Fig. 8.39A) and the fetal surface of a placenta succenturiata. Fig. 8.39B. Maternal surface looks rough and shaggy. It shows 15–20 convex polygonal areas as lobes or cotyledons bounded by fissures. Membranes are seen at the margin. Fig. 8.39B shows the fetal surface of a placenta succenturiata. The fetal surface looks smooth and shiny as it is covered by amnion layer. The umbilical cord is attached at/ or near the center. There is one small lobe (size of a cotyledon) situated at a distance from the main placental margin. It has vascular communication (arrow mark). It is a placenta with a succenturiate lobe.

Self assessment: (i) What are the surfaces of a normal placenta and how they could be identified (see above)? (ii) What is the weight of a normal placenta? (iii) what is the normal attachment of a placenta (see above)? (iv) clinical significance of placenta succenturiata: **Ans.** Increased risk of abortion, antepartum haemorrhage. (v) What other abnormalities of placenta are commonly seen? **Ans.** Battledore placenta (cord inserted at the margin of placenta).



Fig. 8.39A: Normal placenta (maternal surface)

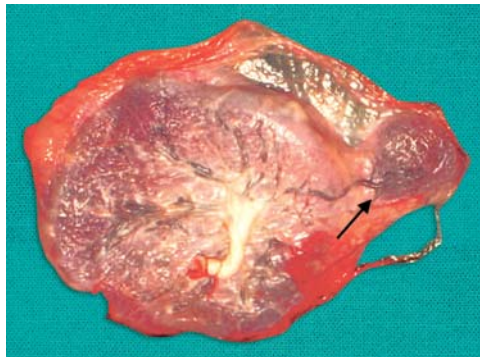


Fig. 8.39B: Placenta succenturiata (fetal surface) Vascular communication is seen (arrow showing)

Fig. 8.40: Rupture uterus

It is a specimen of gravid uterus showing ragged, irregular, blackish necrosed margin along the lateral wall of the uterus. Cervix is not seen. It is a specimen of rupture uterus. Subtotal hysterectomy with conservation of ovaries had been done.

Self assessment:

Q. What are the common causes of rupture uterus?

Ans. A. Obstructed labor, Injudicious oxytocin use in labor B. rupture of uterine scar (C.S).

Q. Differentiation of scar dehiscence from scar rupture?

Ans. see p 37.

Q. How the diagnosis of rupture uterus (spontaneous as well as scar) is made?

Ans. see p 37.

Q. How do you manage a case of rupture uterus?

Ans. Resuscitation and laparotomy. Laparotomy and Hysterectomy (commonly subtotal). Repair of uterus may be done in a selected case with scar rupture. Repair and bilateral tubal ligation may also be done.

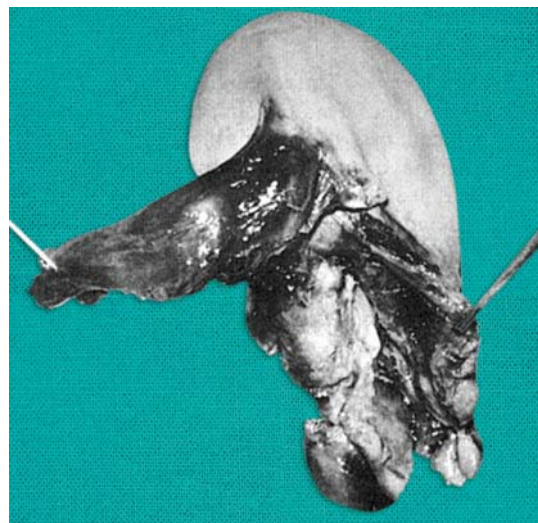


Fig. 8.40: Rupture uterus

Fig. 8.41: Unruptured tubal ectopic pregnancy

It is a photograph (endoscopic panoramic view) of an unruptured tubal ectopic pregnancy. Ectopic pregnancy is seen at the region of ampulla of the tube (Rt.).

Self assessment:

- i. How a case of acute (ruptured) tubal ectopic pregnancy is diagnosed? **Ans.** Symptoms: amenorrhoea, acute abdominal pain, vaginal bleeding, Signs: Pallor, features of hypotension, shock, positive pregnancy test.
- ii. How a case of unruptured tubal ectopic pregnancy is diagnosed? **Ans.** (estimation of serum β -hCG (positive in low concentration), TVS (adnexal mass, empty uterine cavity) and laparoscopy (confirmation of diagnosis, see Fig below).
- iii. Management of acute tubal ectopic pregnancy. **Ans.** Resuscitation and laparotomy for salpingectomy is done. Blood transfusion is often needed.
- iv. Management of an unruptured tubal pregnancy. (see below: Fig. 8.41)

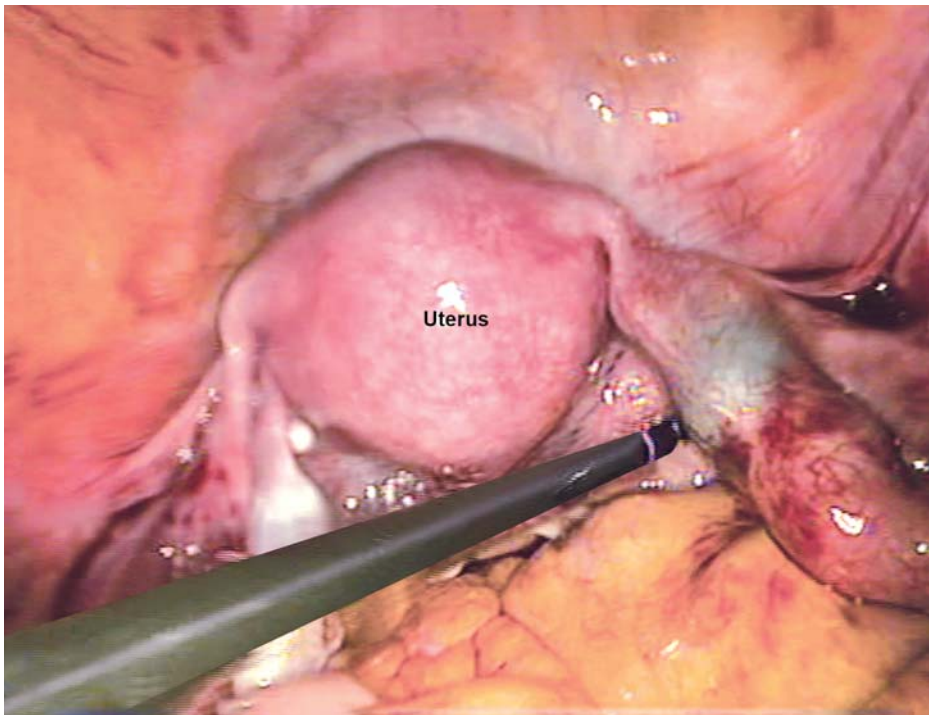


Fig. 8.41: Unruptured tubal ectopic pregnancy (laparoscopic view)

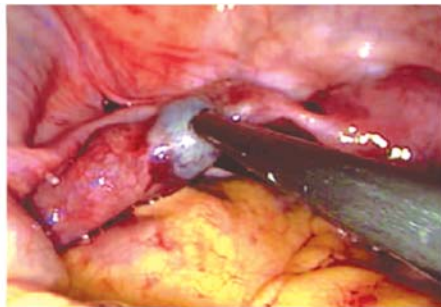


Fig. 8.41A: Unruptured tubal ectopic pregnancy. Salpingostomy is being done laparoscopically

IMAGING STUDIES

Chapter Objectives

Imaging Studies

Basic knowledge and understanding

- Ultrasonogram
- Magnetic Resonance Images



- Rational use
- Assessment of fetal wellbeing and maternal health
- Interpretation of results
 - Adverse effects (if any)
- To screen/diagnose maternal and fetal complications

ULTRASONOGRAM

Gestational Sac (Fig. 8.42)

Q. *What is seen in the Ultrasonogram?*

Ans. A well-defined gestational sac (GS) within the uterine cavity is seen. The sac is located eccentrically within the uterine cavity.

Q. *What is the usual location of the GS within the uterine cavity?*

Ans. GS is normally located eccentrically within the uterine cavity. This is an important observation to differentiate it from a pseudosac.

Q. *How ultrasonographically we can differentiate a normal gestation sac from a pseudosac?*

Ans. Normal gestation sac is eccentric in position within the endometrium of fundus or body of the uterus. Pseudo gestational sac is irregular in outline and usually located centrally in the uterus. The pseudo sac remains empty and has no double decidual sign.

Q. *What is double decidual sign?*

Ans. Double decidual (Fig. 8.43) sign of gestational sac is due to the interface between the decidua and the chorion. It appears as two distinct layers of the wall of the gestation sac.



Fig. 8.42: Gestational sac

Q. *At what early weeks of gestation the GS could be seen?*

Ans. Gestation sac could be seen as early as 4.5 to 5 weeks period, with the use of transvaginal ultrasonography.

Q. *How is the shape of the gestation sac?*

Ans. Normal gestation sac appears round in early weeks and gradually it becomes oval in shape.

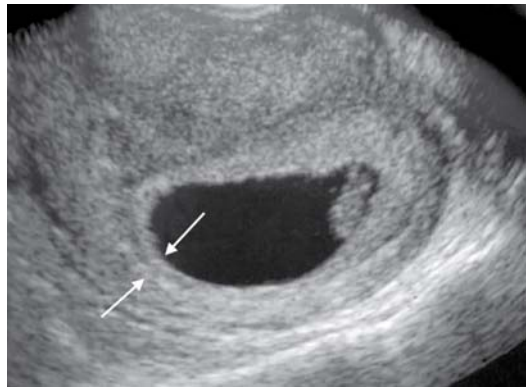


Fig. 8.43: Double decidual sign

Q. *What is the significance of the diagnosis of gestation sac?*

- Ans.**
- (a) Presence of an intrauterine gestational sac is a reliable evidence of intrauterine pregnancy.
 - (b) Presence of gestation sac outside the uterine cavity suggests ectopic pregnancy.
 - (c) Fetal gestational age could be estimated measuring the *mean sac diameter* (MSD)
 - (d) Abnormal size of the GS is an indication of abnormal outcome.

Yolk Sac (Fig. 8.44)

Q. *When does yolk sac (YS) appear?*

Ans. Yolk sac is the first structure seen normally within the gestation sac (GS). Yolk sac is seen normally with Transabdominal Sonography (TAS) when the mean GS diameter is 10-15 mm. With the use of Transvaginal Sonography (TVS), yolk sac is seen with the mean sac diameter of 8 mm (5.5 weeks)

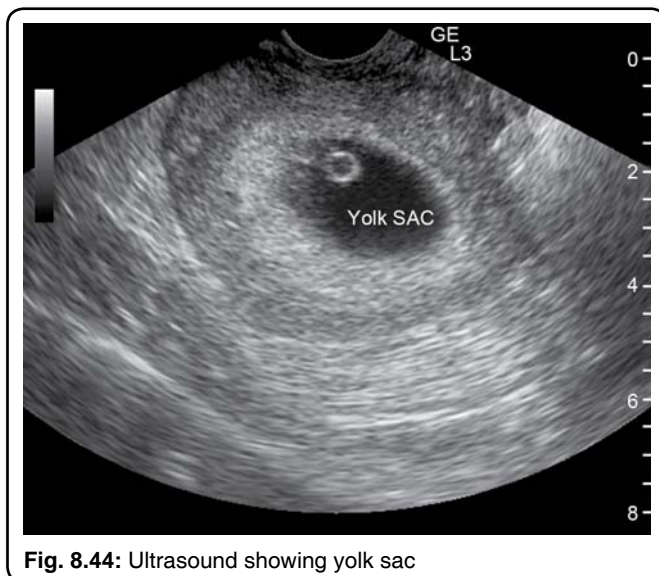


Fig. 8.44: Ultrasound showing yolk sac

Q. What are the significance(s) of the detection of yolk sac?

- Ans.** (a) Presence of yolk sac is diagnostic of intrauterine pregnancy
 (b) Presence of yolk sac differentiates an early intrauterine GS from a pseudo sac
 (c) Number of yolk sacs and the number of amniotic sacs are the same.

Q. What are the functions of the yolk sac?

- Ans.** (a) It plays an important role in embryonic development by transfer of nutrients
 (b) Fetal angiogenesis starts in the wall of the yolk sac.
 (c) Fetal hematopoiesis occurs in the yolk sac
 (d) Primitive gut is formed from the dorsal wall of the yolk sac

Crown Rump Length (CRL) (Fig. 8.45)**Q. At what time of gestation the embryo appears?**

- Ans.** Embryo first appears adjacent to the yolk sac at 6 week of gestation

Q. How the CRL is measured?

- Ans.** CRL is measured with caliper placed from the top of the head to the end of bottom (excluding the limbs)

Q. What is the importance of CRL measurement?

- Ans.** (a) Measurement of CRL in the first trimester can predict the fetal gestational age more accurately ($\pm 5-7$ days)
 (b) Screening of aneuploidy is best done by late first trimester ultrasonography

Embryonic Cardiac Activity**Q. What period of gestation embryonic heart begins to beat?**

- Ans.** Tubular embryonic heart begins to beat at 36-37th day of gestational age.

Q. What is the rate of embryonic heart?

- Ans.** Normal embryonic cardiac activity is >100 beats per minute

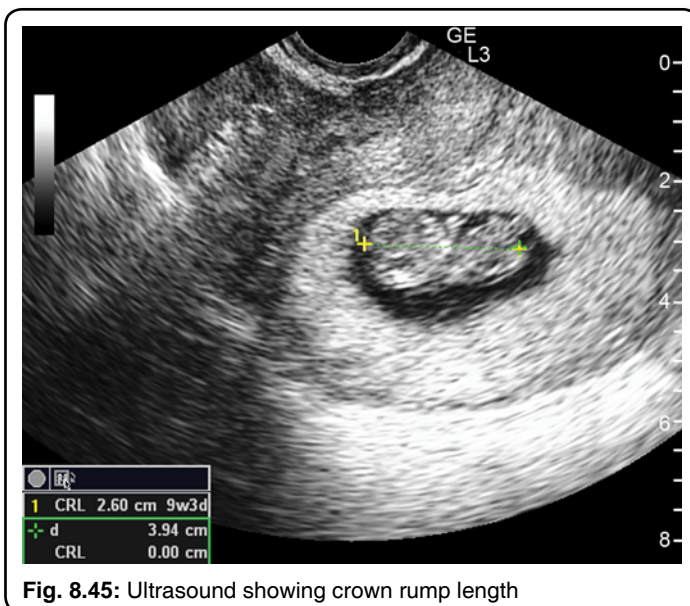


Fig. 8.45: Ultrasound showing crown rump length

Q. What is the significance of detection of embryonic cardiac activity?

Ans. Presence of cardiac activity indicates a viable embryo. Absence of embryonic cardiac activity is the most important factor to predict poor pregnancy outcome

Fetal Cardiac Activity

Q. What is the normal fetal heart rate?

Ans. Normal fetal heart rate varies between 100 and 160 beats per minute

Q. How early diagnosis of IUFD could be made using Sonography?

Ans. Sonography can make the diagnosis of IUFD earliest. The evidences of IUFD are:

- Absence of fetal cardiac motion
- Absence of all other fetal movements during a careful observation period with sonography.
- Careful observation of absent fetal cardiac activity with real time sonography is a strong presumptive evidence of fetal death.

Fig. 8.46: BPD and HC: It is an ultrasonogram showing the fetal head. In this view the biparietal diameter (BPD) and the head circumference (HC) had been measured as a part of fetal biometry (Dutta Obs 8/e, p 735)

Self assessment:

Q. What is the importance of BPD measurement?

Ans. BPD is most accurate for assessment of fetal gestational age from 14–24 weeks (variation ± 8 days).

Q. How BPD is measured?

Ans. It is measured from outer edge of proximal skull to the inner edge of the distal skull. It is measured at the level of thalami and cavum septum pellucidum

Q. What is the importance of HC?

Ans. Head shape dolichocephaly (flattened) or (brachycephaly) rounded is known. HC is more reliable than BPD.

Q. What other fetal parameters are measured to determine fetal gestational age?

Ans. Femur length (FL) and abdominal circumference (AC). AC is measured at the level of fetal stomach and umbilical vein.

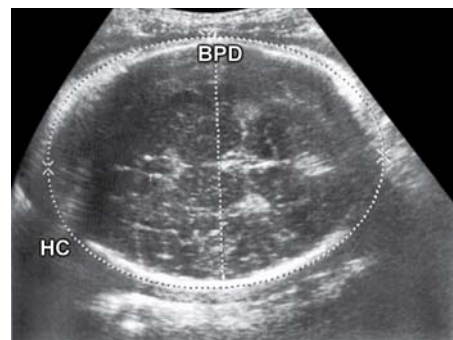


Fig. 8.46: BPD and HC

Fig. 8.47: Ultrasonogram showing two fetal heads in twin pregnancy

Self assessment:

Q. How the diagnosis of twin pregnancy can be made clinically?

Ans. see p 72.

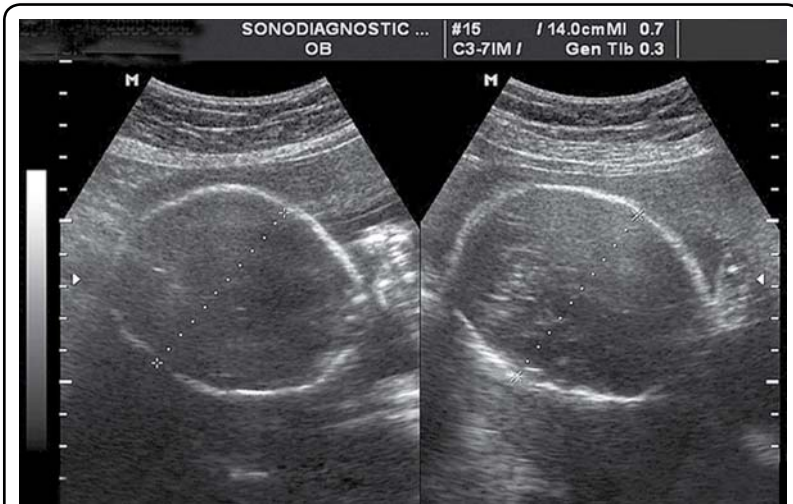


Fig. 8.47: Ultrasonogram showing two fetal heads in twin pregnancy

Q. *What other information can be obtained from sonography besides the confirmation of diagnosis?*

Ans. see p 72

Q. *What are the complications (maternal and fetal) of twin pregnancy?*

Ans. see p 72, 73

Q. *Outline the management of twin pregnancy in labor.*

Ans. see p 73

Fig. 8.48: Ultrasonogram: Placenta Previa

It is an ultrasonogram showing placenta praevia where the placenta is seen implanted over the anterior wall of the lower segment approaching the internal os.

Self assessments:

Q. *What are the common causes of antepartum hemorrhage?*

Ans. see p 85

Q. *What are the types of placenta previa?*

Ans. see p 86

Q. *How do you differentiate a case of placenta previa from abruptio placenta?*

Ans. see p 90

Q. *What are the complications of placenta previa?*

Ans. see p 86

Q. *How do you manage a case of placenta praevia?*

Ans. see p 86

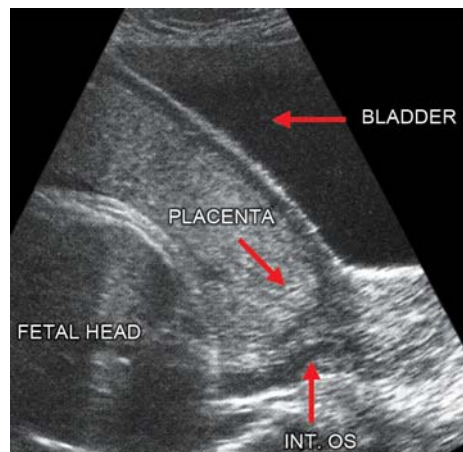


Fig. 8.48: Ultrasonogram: Showing placenta praevia

Fig. 8.49: Ultrasonogram: Hydatidiform mole

Fig. 8.49(A) showing grape-like vesicles of varying sizes. These are the tissues of molar pregnancy.

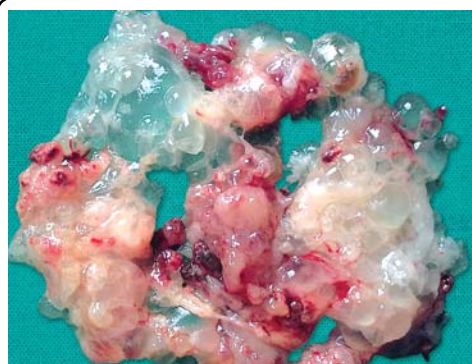
**Fig. 8.49A****Fig. 8.49B**

Fig. 8.46B is an ultrasonogram showing snowstorm appearance of a molar pregnancy.

Self assessment:

Q. How a case of molar pregnancy commonly presents?

Ans. see p 354

Q. What are the complications of a molar pregnancy?

Ans. Hemorrhage, shock, preeclampsia, sepsis, acute pulmonary insufficiency and rarely coagulation failure. The late complications are development of persistent trophoblastic neoplasia and choriocarcinoma.

Q. How do you manage a case of hydatidiform mole?

Ans. Principles of management are—(a) Supportive therapy (blood transfusion), (b) Suction evacuation of the uterus and (c) follow up (p. 355).

Fig. 8.50: Doppler (ultrasound) Fetal Monitor—(A) Device and (B) In use**Self assessment:**

Q. Earliest at what weeks the FHS could be detected with a Doppler.

Ans. Using Doppler Ultrasound fetal cardiac motion could be detected as early as 7th week of pregnancy. FHS is heard using a hand held Doppler at around 10 th week of pregnancy.

Q. What are the other alternatives when FHS is not audible with a stethoscope?

Ans. (a) Hand held Doppler, (b) CTG, (c) Ultrasound for cardiac motion.

Q. What are the advantages of EFM over the clinical?

Ans. see p 204

Q. What are the causes of fetal bradycardia?

Ans. see p 204

Q. What are the characteristics of an abnormal CTG?

Ans. see p 205

Q. What other tests could be done when a CTG is abnormal?

Ans. see p 208

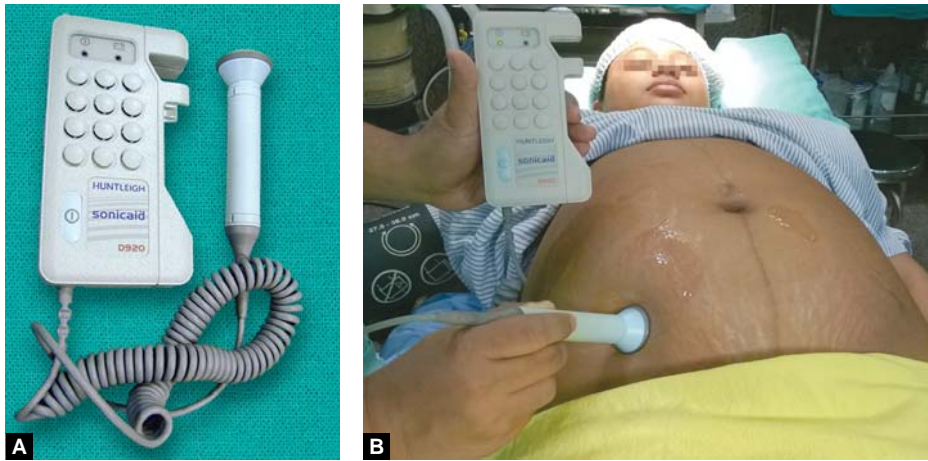


Fig. 8.50: Doppler (ultrasound) fetal monitor is being used

MAGNETIC RESONANCE IMAGING (MRI)

MRI (Fig. 8.51) is useful to obtain high soft tissue contrast and for acquisition of images in different planes. MRI could be used for assessment of: **A. Fetal:** anatomy survey, fetal biometry and also as a complement to sonography. **B. Maternal:** cerebral vascular flow study, evaluation of placenta praevia and accreta.

Q. Is MRI safe in pregnancy?

Ans. MRI has got no ionizing radiation effect. MRI studies during pregnancy are found safe to the fetus and the mother.

Q. Is there any complications of MRI?

Ans. MRI needs a higher level of cooperation from the patient. The patient is placed on a table that goes into a space surrounded by the magnet. Claustrophobia have been observed in about 5% of patients. Movement of the fetus during MR sequence may distort the images.

Q. What are the contraindications of MR imaging?

Ans. Common contraindications are :

- Cardiac pacemaker
- Ocular metallic foreign body
- Cochlear Prosthesis
- Magnetic dental implants

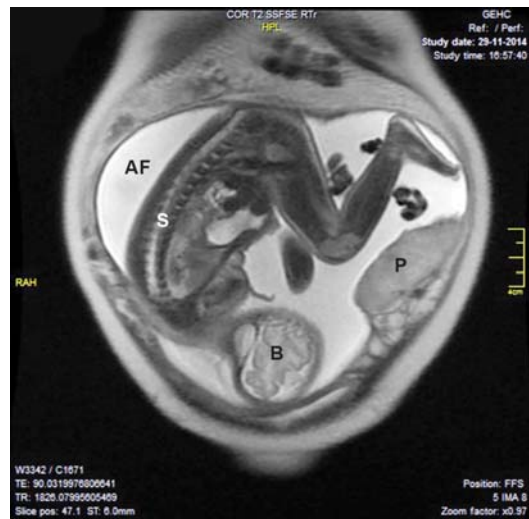


Fig. 8.51: A sagittal balanced MR image of a fetus at 31 weeks of gestation (AF = amniotic fluid; S = spine; P = placenta; B = brain)

DRUGS IN OBSTETRICS

- **Oxytocics**
- **Antihypertensives**
- **Anticoagulants**
- **Anticonvulsants**
- **Tocolytic Drugs**

Chapter Objectives

Good knowledge and understanding with the effects on mother and the fetus

- Rational therapy in relation to period of gestation (safety issues)
- Drug dose, route of administration and duration
- Response evaluation
- Adverse effects

I. OXYTOCICS

Q. What are oxytocics ?

Ans. Oxytocics are the drugs that stimulate myometrial contractions. Drugs belonging to this group are (Fig. 8.52):

- ♦ Oxytocin
- ♦ Methylethergometrine (methergin)
- ♦ Prostaglandins PGE_1 , PGE_2 , $\text{PGF}_{2\alpha}$



Fig. 8.52: Oxytocics: Oxytocin, methergin, misoprostol (PGE_1); carboprost ($\text{PGF}_{2\alpha}$), prostin (PGE_2)

Oxytocin is a nonapeptide. It stimulates myometrial contractions during pregnancy, labor and puerperium.

Storage: Injection: Refrigerate $2^\circ\text{--}8^\circ\text{C}$. Stable for 3 months at room temperature $15^\circ\text{--}25^\circ\text{C}$.

Oxytocin

Synthetic oxytocin ■ Syntocinon is commonly used. (One ampule containing 5 IU/ml).

Mode of administration: IV—slow, IV infusion, and IM

Onset of action: IV—almost immediate, IM 3–5 minutes.

Duration of action: IV—20 minutes to 1 hour. IM: 2–3 hours.

Indications

Pregnancy:

- a. Early:
 - To accelerate abortion process (inevitable and missed)
 - To expedite to expulsion of molar pregnancy
 - To control bleeding following evacuation of the products of conception from the uterus.
- b. Late:
 - To induce labor.
- b. Labor:
 - Active management of third stage of labor.
- c. Postpartum:
 - To control (prophylactic) PPH.

Q. What are the dangers of oxytocin use ?

Ans. Maternal: Uterine hyperstimulation, uterine rupture and water intoxication.
 Fetus: Fetal distress, hypoxia and fetal death.
 Contraindications: Grandmultipara, contracted pelvis, malpresentation, fetal distress and obstructed labor

Methergin (Methylergometrine)

It is a semisynthetic ergot alkaloid that acts directly on the myometrium.

Methergin stimulates powerful (tetanic) uterine contractions.

(1 ampule = 0.2 mg/ml).

Routes of administration: IM, IV and per oral

Onset of action: IV—40 to 60 seconds; IM: 6–7 minutes; oral 10 minutes

Duration of action: 3 hours.

Indications of use:

- a. In the active management of third stage of labor.
- b. To control atonic postpartum hemorrhage.
- c. To control hemorrhage following evacuation operation in cases with incomplete/missed abortion and molar pregnancy.

Hazards:

- a. Nausea and vomiting
- b. Rise in blood pressure, myocardial infarction and bronchospasm

Contraindications of use:

1. In twin pregnancy until the second baby is delivered
2. Organic heart disease — may cause heart failure
3. Severe preeclampsia
4. Eclampsia
5. Rh-negative mother

Q. What are the reasons that prophylactic ergometrine should not be given to all cases?

Ans. See SAQ, p. 222.

Prostaglandins (PGE_1 , PGE_2 , PGF_{2a})

Use in obstetrics:

1. Induction of abortion: PGE_1 , PGE_2
2. Induction of labor: PGE_1 , PGE_2
3. Cervical ripening: PGE_2 , PGE_1
4. Management of atonic PPH: PGE_1 , PGF_{2a} (p. 93)

II. ANTIHYPERTENSIVES

Methyldopa

It works as a central and peripheral anti adrenergic drug. Once in the brain, it is converted into α - methylnorepinephrine by the enzyme dopa decarboxylase. α - methylnorepinephrine lowers arterial blood pressure through activation of α_2 - adrenergic receptors and also by lowered sympathetic outflow. It is the drug of first choice in pregnancy hypertension. It is effective and is proved to be safe both for the mother and the fetus.

Dose: It is given orally 250mg, 2-3 times daily. Dose may be increased to a maximum 3gm daily in divided doses.

Side effects: Maternal, Dry mouth, postural hypotension, sedation, bradycardia, headache, depression, hepatitis, hemolytic anemia, mild psychosis

Fetal: Intestinal ileus

Contraindications and Precaution: Hepatic disorders, psychic patients, congestive cardiac failure and postpartum depression.

Labetalol

It is used as an antihypertensive in pregnancy. It works as a combined α and β adrenergic receptor blocking agent. It has mild α and predominant β adrenergic receptor blocking actions. Labetalol blocks the β adrenoreceptors in the heart and in addition it has an arteriolar vasodilating action. It lowers the peripheral vascular resistance.

It is also used parenterally for the control of hypertensive crises in pregnancy.

Dose:

- ♦ Orally 100 mg tid; may be increased maximum up to 2.4 gm daily
- ♦ IV injection (hypertensive crisis): 20-40 mg IV over at least 1 minute, It may be repeated at every 10-15 minutes, until the desired effect is observed, maximum up to 200 mg.

Side effects: Postural hypotension, tremors, headache, bronchospasm, congestive cardiac failure. *Efficacy and safety* with short term use appear equal to methyldopa.

Contraindications and precautions: Asthma, Cardiac failure, hepatic disorders and bradycardia. Labetalol may block the signs of acute hypoglycemia.

Hydralazine

It works by peripheral vasodilatation as it relaxes the arterial smooth muscle. It is used as an adjunct to other agent like methyldopa or β blockers. It increases the cardiac output and renal blood flow. It is prescribed for cases with moderate to severe hypertension (adjunct therapy) and in cases with hypertensive crisis in pregnancy.

Dose: Orally: 25 mg twice daily, may be increased maximum up to 100 mg a day.

IV: 5-10 mg diluted with 10 ml normal saline, may be repeated after 20-30 minutes maximum- 20 mg

Side effects:

Maternal: Tachycardia, palpitation, hypotension, flushing, arrhythmia, lupus like syndrome (following long term therapy), thrombocytopenia

Fetal: Reasonably safe

Neonatal: Thrombocytopenia

Contraindications and precautions: Severe tachycardia, systemic lupus erythematosus, high output failure, hepatic and renal impairment, breastfeeding (harmful effect not known -to monitor infant).

III. ANTICOAGULANTS

Heparin and Low Molecular Weight Heparin (LMWH)

Heparin

It inhibits the action of thrombin. It enhances the action of antithrombin III, and increases factor Xa inhibitor.

It is used for the initial treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE).

As prophylaxis it is used in patients undergoing surgical procedures (caesarean section, hysterectomy)

Dose: Loading dose of 5000 units – 10000 units followed by continuous IV infusion of 15-25 units/kg/hr. (with monitoring)

Pregnancy: 5000-10000 units SC every 12 hours (with monitoring)

Low molecular Weight Heparin (LMWH): LMWHs (Enoxaparin) are effective and safe as unfractionated heparin. They have longer duration of action. They are used with single daily SC injection. Prophylactic regimen of LMWH does not need monitoring.

Dose: 20 mg (2000 units) to 40 mg (4000 units)

SC injection every 24 hours

Side effects: Maternal: Haemorrhage, thrombocytopenia, hyperkalemia, osteoporosis (prolonged use) and alopecia.

Fetal: Does not cross the placenta, and these drugs are not teratogenic

Contraindications & Precautions:

Haemorrhagic disorders, thrombocytopenia, peptic ulcer, severe hypertension, recent cerebral haemorrhage, hepatic and renal impairment

Antidote: Protamine sulphate

IV. ANTICONVULSANTS

Commonly used anticonvulsants are: Magnesium sulfate (MgSO_4), diazepam and phenytoin.

Magnesium sulfate ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$)

Magnesium sulfate: It is the drug of choice, in the management of eclampsia (p. 210). It is a membrane stabilizer and neuroprotector. It is given IV and IM (p. 210). Monitoring of drug dose is simple.

Magnesium sulfate is continued for 24 hours after the last seizure or delivery which ever is later. Therapeutic level of serum Mg is 4-7 mEq/l. Antidote to MgSO_4 toxicity is—Injection calcium gluconate 10 ml (10%) to be given slow IV.

Pharmacology: Magnesium (Mg) is essential mineral present mostly in the intracellular compartment. It decreases release of acetylcholine at the neuromuscular junction and also reduces the sensitivity of motor end plate to acetylcholine. Magnesium has got its, depressant effects on CNS and respiratory system. These effects are antagonized by calcium. magnesium causes vasodilation. When used in pregnancy Magnesium reduces uterine vascular resistance and increases the uteroplacental blood flow. This is beneficial to the mother as it reduces the systemic arterial pressure. It is also beneficial to the fetus to increase the fetoplacental blood circulation.

Uses of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$:

1. Prevention and control of seizures in obstetrics—eclampsia, severe pre-eclampsia (prophylactic use).
2. Tocolysis (preterm labour).
3. Hypomagnesemia (acute or chronic).

Dose schedule: Eclampsia, Pre-eclampsia, Tocolysis

A. Intramuscular dose schedule

- a. MgSO_4 4 gm: 20% solution IV slowly (1gm/minute)
- b. MgSO_4 10 gm 50% solution; 5 gm deep IM in the upper and outer quadrant of each buttock.
- c. MgSO_4 5 gm 50% solution deep IM (same as in b) every 4 hours on alternate buttock.
- d. In case of recurrence of fits: MgSO_4 2 gm IV 20% solution slowly (at the rate of 1gm/minute).

B. Intravenous dose schedule

- a. 4 gm diluted in 100 ml of normal saline given over 15–20 minutes
- b. 1-2 gm/hour in 100 ml of normal saline
- c. Monitor for magnesium toxicity.

- C. Tocolysis: Dose schedule the same as that in eclampsia.
- D. Hypomagnesemia:
- IV-10 mg/kg (20% solution) of MgSO_4 over 15–20 minutes then IV infusion 1 gm/hour.
 - IM 10 mg/kg every 6 hours four doses.
 - Normal plasma level: 1.5 – 2.2 mEq/l
 - Therapeutic plasma level: 4 – 6 mEq/l
 - Magnesium is eliminated via the kidneys.
- Supplied as injection 10% (0.8 mEq/100 mg/mL), 50% (4 mEq/500mg/mL)

Pharmaco-kinetics:

| | |
|---------------------|-----------------------------------|
| Onset of action: | IV immediate IM within an hour |
| Peak effect: | IV: Few minutes IM: 1–3 hours |
| Duration of action: | IV: 30 minutes IM: 3–4 hours. |

Drug interaction:

- It potentiates the effects of both depolarizing and nondepolarizing group of muscle relaxants
- Potentiates the CNS depressant effects of sedatives, narcotics, volatile anesthetics.

Monitoring parameters of MgSO_4 ,

- Respiratory rate: 16/min
- Urine output: 30 ml/hour
- Presence of deep tendon reflexes (Petellar reflex)
- Serum level of magnesium should be <10 mEq/l

Toxicity of magnesium:

- Respiratory depression
- Neuromuscular paralysis
- Renal suppression.

Precautions of use and management of magnesium toxicity:

- Life-threatening hypermagnesemia:
 - Calcium gluconate 1gm-IV (10 mL–10%)
 - Fluid loading and forced diuresis.
- Periodic measuring of plasma magnesium level in selected cases besides clinical monitoring (see above). Knee jerk reflex to be tested before each dose of magnesium sulfate. Repeat dose should be withheld when knee jerks are absent.
- Magnesium is contraindicated in patients with—*a)* heart block and *b)* myasthenia gravis.

Side effects/Toxicity of magnesium sulphate

- A. Cardiovascular:
- Hypotension

- b. Heart block
- c. Circulatory collapse.
- B. CNS: Depressed reflexes; flaccid paralysis
- C. Pulmonary: Respiratory paralysis
- D. Metabolic hypocalcemia
- E. Others: Flushing, sweating.

Magnesium toxicity resulting in maternal death is rare.

MgSO₄ is the drug of choice to treat and prevent subsequent convulsion in eclampsia. Recurrence of fits following MgSO₄ therapy only 10%.

In these cases bolus of 2 gm of magnesium sulfate can be given IV over 3–5 minutes.

Magnesium toxicity should be considered in those women who do not regain consciousness. Compared to the other drugs (diazepam, phenytoin and lytic cocktail) MgSO₄ was associated with significantly lower rate of recurrent seizures (9.4% versus 23.1%) and lower rate of maternal death (3% versus 4.8%).

V. TOCOLYTIC DRUGS

Tocolytics are drugs that inhibit uterine contractions. Tocolytics are commonly used in the management of preterm labour. The commonly used drugs are—calcium channel blockers (nifedipine), magnesium sulphate, betamimetics (ritodrine) or oxytocin antagonists (atosiban).

Betamimetics

Ritodrine is given IV infusion. Isoxsuprine (duvadilan) can be given orally or IV infusion. Drugs are effective for short-term benefit.

Side effects: Betamimetics — Headache, palpitation, tachycardia and pulmonary edema.

Calcium Channel antagonists (Nifedipine, Nicadepine)

Nefidipine: These drugs interfere with the inward displacement of calcium ions through the cell membranes. These drugs influence the myocardial cells and the cells of the vascular smooth muscle. Nifedipine relaxes the vascular smooth muscles dilates the coronary and peripheral arteries. It is used for the management of hypertension, hypertensive crises as well as for tocolysis.

Dose: Oral: 10-20 mg every 4-6 hours

Side effects: Headache, flushing, tachycardia, palpitation, nausea, fall in blood pressure, visual disturbances.

Contraindication and precautions: Aortic stenosis, ischaemic chest pain, hypotension, poor cardiac reserve, diabetes mellitus.

SPACE FOR NOTES

CHAPTER

9

Maternal Health—Global Scenario and India

- **Safe Motherhood**
- **National Rural Health Mission (NRHM)**
- **Millennium Development Goals (MDGs)**
- **Maternal Health Beyond 2015**



Fig. 9.1

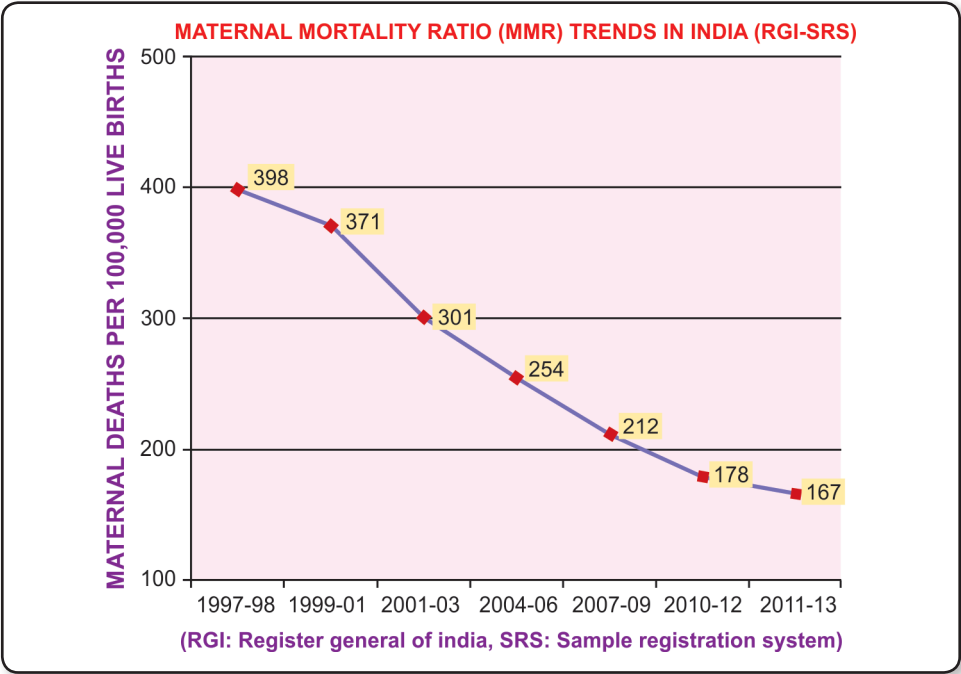
Maternal Mortality Ratio (MMR), Maternal Mortality Rate and Life Time Risk

Levels of Maternal Mortality Ratio (MMR) by Regions

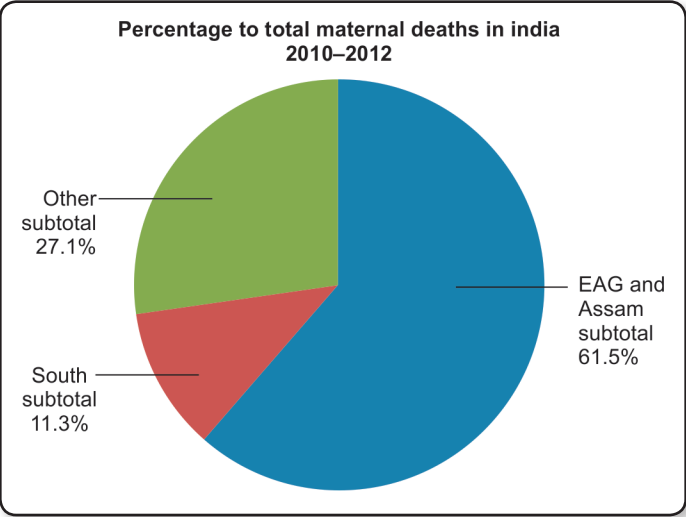
| Region | MMR | Maternal mortality rate | Lifetime risk | % to total maternal deaths |
|------------------|-----|-------------------------|---------------|----------------------------|
| India | 178 | 12.4 | 0.4% | 100.0 |
| EAG and Assam | 257 | 23.3 | 0.8% | 61.5 |
| South (subtotal) | 105 | 5.9 | 0.2% | 11.3 |
| Other (subtotal) | 127 | 7.8 | 0.3% | 27.1 |

EAG and Assam, Southern Subtotal, Other Subtotal, and India: 2010–2012
(EAG: Empowered Action Group States and Assam)

Levels of Maternal Mortality Ratio (MMR), 1997–2012



Percentage to total maternal deaths in India, 2010–2012



Maternal mortality and neonatal death is a matter of great concern worldwide. Maternal death is a strong indicator of the quality of health care delivery system for any country.

Maternal Mortality Ratio in India (SRS 2011-2013)

| India 167 / 100,000 Live births | | | | | |
|--|-----------|-------------|----------------|---------|-------------|
| States in India that have reached the MDG target and the states that are in close proximity to MDG are as below: | | | | | |
| Kerala | Tamilnadu | Maharashtra | Andhra pradesh | Gujarat | West Bengal |
| 61 | 79 | 68 | 92 | 112 | 113 |

MILLENNIUM DEVELOPMENT GOALS (MDG 4 and 5)

Q. What is understood by MDGs ?

Ans. These are global movements of academics, governments, international agencies, health care professional associations, donors and nongovernmental associations with the Lancet as key partners for effective interventions to improve maternal, newborn and child health. The interventions also include policies, financial flow and equity.

Q. Mention the important MDGs and their goals.

MULTIPLE MDGs

MDG 4: Reduction of child mortality

MDG 5: Improvement of maternal health

MDG 1: Eradication of extreme poverty and hunger

MDG 6: Combating HIV/AIDS, malaria and others

MDG 7: To ensure environmental sustainability (improved access to safe water and access to improved sanitation).

Count down tracks progress in the 68 countries throughout the globe where more than 95% of all maternal and child deaths occur. MDG 5 aims reducing maternal deaths by 75% over 1990–2015 with an average annual rate of reduction of 5.5%. Current (1990–2008) observation states that annual reduction rate is around 1.3% which is well short of the target (MDG 5).

♦ **India is to achieve the target of reducing maternal deaths to 109 per lakh live births by 2015 according to MDG, NRHM.**

Q. What is the current situation ?

Ans. The states in India that have reached MDG target in 2007–2009 are Kerala, Tamil Nadu, Maharashtra and Andhrapradesh. The sates that are in close proximity to MDG target are West Bengal, Gujarat and Haryana.

Q. How do you define a maternal death and what is maternal mortality ratio ?

Ans. Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by pregnancy or its management but not due to accidental or incidental causes.

Maternal mortality ratio (MMR) is expressed in terms of maternal death per 100,000 live births. In India MMR is 178 per 100,000 live births. In the developed world, it is below 10 per 100,000 live births. Globally it is 400/100000 LB.

Maternal mortality rate is defined as the number of maternal deaths to women in the ages 15–49 per 100,000 women in that age group.

Life time risk is defined as the probability that, one woman of reproductive age (15–49 years) will die due to complications of pregnancy, childbirth or puerperium, assuming that chance of death is uniformly distributed across the entire reproductive span.

Q. What do you understand by the term maternal near miss (MNM) or severe acute maternal morbidity (SAMM)?

Ans. MNM or SAMM is understood in simpler term in this way. Normal pregnancy ⇒ Complications ⇒ Maternal morbidity due to the complications ⇒ Severe morbidity ⇒ Severe life threatening morbidity ⇒ **Maternal near miss (the woman survived) or maternal death (the woman died).**

Q. How do you define maternal near miss or SAMM?

Ans. A woman who nearly died but survived a complication that occurred during pregnancy childbirth or within 42 days of termination of pregnancy.

Q. What is understood by maternal near miss?

Ans. Maternal near miss is defined as a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy (WHO). Any life-threatening complications of pregnancy that results in an organ dysfunction, is used to identify as maternal near miss. The classification of causes are the same as that of maternal deaths (Dutta Obs 8/e, p 683). Maternal near miss is also an important indicator for assessment of the quality of care provided to a pregnant woman for that country.

Q. What are the common life-threatening conditions in pregnancy, labor and puerperium?

Ans.

- A. Hemorrhage (APH, PPH, ectopic pregnancy and abortion)
- B. Hypertensive disorders in pregnancy (pre-eclampsia and eclampsia)
- C. Sepsis (puerperal, postabortal)
- D. Other systemic disorders: Renal failure, pulmonary edema, disseminated intravascular coagulopathy (DIC).

Millennium development goals (MDG)**MDGs time-bound targets: India**

| Goal No. | Goals | Indicators | Target by 2015 |
|----------|-------------------------|--------------------------------|----------------|
| 5 | Improve maternal health | Maternal mortality ratio (MMR) | 109 |
| 4 | Reduce infant mortality | Infant mortality rate (IMR) | 28 |

GLOBAL ESTIMATES OF THE CAUSES OF MATERNAL DEATHS (WHO : 1997-2007)

| Causes | Percentage (%) |
|---|----------------|
| ♦ Hemorrhage | 35 |
| ♦ Hypertension (pre-eclampsia, eclampsia) | 18 |
| ♦ Sepsis | 8 |
| ♦ Abortion | 9 |
| ♦ Embolism | 1 |
| ♦ Other direct | 11 |
| ♦ Indirect | 18 |

NB: Hemorrhage and hypertension account for more than half (53%) of all maternal deaths

GLOBAL CAUSES OF DEATHS AMONG CHILDREN AGES 0–59 MONTHS (WHO)

| Neonatal (41%) | | Postneonatal (59%) | |
|------------------|----------------|-----------------------------|----------------|
| Causes | Percentage (%) | Causes | Percentage (%) |
| • Preterm | 12 | • Pneumonia | 14 |
| • Birth asphyxia | 9 | • Infections | 9 |
| • Sepsis | 6 | • Non-communicable diseases | 4 |
| • Pneumonia | 4 | • Meningitis | 2 |
| • Congenital | 3 | • Pertussis | 2 |
| • Tetanus | 1 | • AIDS | 2 |
| • Diarrhea | 1 | • Malaria | 8 |
| • Other neonatal | 5 | • Injury | 3 |
| | | • Measles | 1 |
| | | • Diarrhea | 14 |

Magnitude of the problem: Out of total 5,36,000 maternal deaths, each year globally, 1,36,000 (27.7%) deaths are in India. For every one woman who dies around 20, women suffer some serious and/or life long disability (morbidity).

Maternal Health in Rural India: Currently maternal mortality in India is 167 per 100,000 live births (SRS: 2011-2013). India is committed to meet the MDG 5 target of less than 100 deaths per 100,000 live births by the year 2015 (see p. 297).

In India 52.3% of birth take place at home and of these just 5.7% of births are attended by a skilled person. Presence of an SBA at every birth, along with availability of an effective referral system, can reduce maternal morbidity and mortality to a considerable extent.

Evidence-based practices have demonstrated that presence of skilled birth attendant (SBA) can effectively reduce maternal mortality.

Government of India pointed out three types of delays that results in an increase in maternal mortality and morbidity.

Delay – I: Delay in recognizing the problem and deciding to seek care.

Delay – II: Delay in reaching the health facility (due to nonavailability of transport, referral facility).

Delay – III: Delay in receiving treatment at the center (due to unequipped health facility, lack of trained personnel, medicines, blood, etc).

| GOALS AND TARGETS TO REDUCE MATERNAL DEATHS IN INDIA | | | |
|--|------|--------------------------|-----------------|
| Organization | Year | Target of MMR reduction | Target year set |
| 1. National Population Policy (NPP) | 2000 | MMR < 100 per 100,000 LB | 2010 |
| 2. National Health Policy (NHP) | 2002 | MMR < 100 per 100,000 LB | 2010 |
| 3. National Rural Health Mission (NRHM) | 2005 | MMR < 100 per 100,000 LB | 2012 |
| 4. 8th MDG 4 and 5 | 1990 | IMR < 30 per 1000 LB | 2015 |
| | | MMR reduction by 75% | |
| | | IMR reduction by 66% | |

Q. What is the action plan for NRHM ?

National Rural Health Mission (NRHM) action plan is to:

- A. Strengthen all primary health centers (PHCs), community health centers (CHCs) and first referral units (FRUs).
- B. Provide basic and comprehensive emergency obstetric care (EmOC) and essential newborn care (see below).
- C. Janani Suraksha Yojana (JSY) under the umbrella of NRHM is to implement the interventions in all the states and union territories (UTs) with a special focus on **low-performing states (LPS)** that they have low institutional deliveries (UP, Uttarakhand, Bihar, Jharkhand, MP, Chattisgarh, Assam, Rajasthan, Orissa, Jammu and Kashmir). The remaining states have been named as **high performing states**.

NRHM and RCH-II

THE KEY MATERNAL HEALTH STRATEGIES IN NRHM and RCH – II

- Providing essential obstetric care, quality antenatal care (ANC) and postnatal care (PNC).
- Providing skilled attendance at every birth
- Promoting institutional delivery
- Operationalizing emergency obstetric care
- Strengthening referral system
- Safe abortion services
- Services to deal reproductive tract infections (RTI) and sexually transmitted infections (STI)

Q. Who is a skilled birth attendant ?

Ans. Skilled birth attendant (SBA) is defined as an accredited health professional (doctor, midwife or nurse) who has been educated and trained to achieve proficiency in the skills, needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period and in the identification, management and referral of complications in women and newborns. Besides doctors, SBAs include auxiliary nurse midwives (ANMs), lady health visitors (LHVs) and staff nurse (SNs). SBAs are trained and made competent to take certain life-saving measures.

PROCEDURES AND DRUGS PERMITTED FOR USE BY SKILLED BIRTH ATTENDANTS (ANMs, LHV's and SNs)

| Sl No. | CONDITION | |
|--------|--|--|
| 1. | Labor management | <ul style="list-style-type: none"> ♦ Partograph plotting for every labor ♦ Safe delivery and care to newborn |
| 2. | Active management of third stage of labor (AMTSL) | <ul style="list-style-type: none"> ♦ Use of uterotonic drugs (oxytocin/ tablet misoprostol) ♦ Controlled cord traction ♦ Uterine massage |
| 3. | Prevention of PPH | <ul style="list-style-type: none"> ♦ AMTSL ♦ Use of oxytocin 10 IU IM or giving misoprostol 600 mcg (for home deliveries) |
| 4. | Management of PPH | <ul style="list-style-type: none"> ♦ Giving Injection oxytocin 10 IU IM ♦ Administering 20 IU oxytocin in 500 mL ringer lactate, IV at 60 drops per minute ♦ Referring to FRU |
| 5. | Management of eclampsia | <ul style="list-style-type: none"> ♦ Giving one dose of Injection MgSO_4 (10 mL) of 5 gm, deep IM in each buttock ♦ Referring to RFU |
| 6. | Vaginal or perineal tears | <ul style="list-style-type: none"> ♦ Identifying tears ♦ Managing first degree tears by use of pad and pressure |
| 7. | Management of puerperal infections/ PROM/secondary PPH | <p>Giving first dose of the following antibiotics and referring:</p> <ul style="list-style-type: none"> ♦ Injection gentamicin 80 mg IM ♦ Capsule ampicillin 1 gm PO ♦ Tablet metronidazole 400 mg PO |
| 8. | Incomplete abortion with bleeding P/V | <ul style="list-style-type: none"> ♦ Digital removal of retained products of conception |

JANANI SURAKSHA YOJANA (JSY)
A Government of India (GOI) Scheme

JSY is an intervention for safe motherhood under the NRHM. The main objective is to reduce maternal and neonatal mortality to promote institutional delivery. The scheme was launched in 12th April, 2005. This scheme is being implemented at all the states and union territories (UTs), with a special focus on **low-performing states (LPS)**. Under the JSY, accredited social health activist (ASHA) works as an effective link between the government and poor pregnant women in the village.

- ♦ JSY focuses specially on poor pregnant women for states that have low institutional delivery (LPS).
- ♦ Each women (beneficiary) registered under the scheme, should have a JSY card along with MCH card.
- ♦ Each pregnant woman is eligible for cash assistance (in Rs.) for institutional delivery as mentioned below:

| Category | Rural area | | Total | Urban area | | Total |
|----------|------------------|----------------|-------|------------------|----------------|-------|
| | Mother's package | ASHA's package | | Mother's package | ASHA's package | |
| | | | | | | |
| LPS | 1400 | 600 | 2000 | 1000 | 200 | 1200 |
| HPS | 700 | 200 | 900 | 600 | 200 | 800 |

Eligibility for cash assistance:

LPS: All pregnant women delivering in government institutions or accredited private institutions.

HPS: Pregnant women below the poverty line.

LPS and HPS: All SC/ST women delivering in a government institutions or accredited private institutions.

Q. Who is an ASHA (accredited social health activist)? What is her role in the community?

Ans. ASHA is a female (preferably a daughter in law) accredited social health worker of 25–45 years age. She is to work in a village with population > 1000 under the NRHM scheme. She is trained over a period of 3–4 weeks for this work.

- She acts as a link person among the beneficiary at the village level with the ANMs, LHVs, doctors at the FRU (Government).
- She arranges escort to the pregnant woman, sick child and provide DOTs, ORS, IFA tablets for the needful.
- She works along with Anganwadi workers (AWWs) and TBAs to provide service under JSY.

Q. What are the components of essential obstetric care and what includes comprehensive EmOC ?

| ESSENTIAL OBSTETRIC CARE AND EMERGENCY OBSTETRIC CARE (EmOC) | |
|--|--|
| THE COMPONENTS OF ESSENTIAL OBSTETRIC CARE | COMPREHENSIVE EmOc (At FRUs under NRHM Scheme) |
| <ul style="list-style-type: none">♦ Early registration of pregnancy (12–14 weeks)♦ Minimum 4 antenatal visits (1st visit: 12–14 weeks; 2nd visit: 14–26 weeks; 3rd visit: 28–34 weeks and 4th visit: 36–40 weeks).♦ Identification of high-risk factors–♦ Delivery: Institutional or with SBA♦ Provision of prompt referral♦ Postnatal care (two)♦ Essential newborn care♦ Early and exclusive breastfeeding♦ Family planning counseling | <ul style="list-style-type: none">• Vacuum extractions• Anesthetic services• Blood transfusion facilities• Cesarean delivery• Manual removal of placenta• Suction evacuation (MVA)• Safe abortion services• Contraceptive services (IUCDs)• Sterilization operations• Referral and transport facilities |

WOMEN’S HEALTH BEYOND 2015

There have been good progress in Millenium Development Goals (MDGs) 4 and 5 to reduce child mortality and to improve maternal health in many parts of the world. The global maternal mortality ratio has declined from 400 per 100,000 live births to 210 between 1990 and 2010. Only 16 countries have achieved the MDG 5 target for maternal mortality by 2015.

There is much concern about the low performance of many countries specially in parts of South Asia and Sub Saharan Africa to achieve the MDG objectives.

It has been thought to develop some strategic actions in the post 2015 era.

1. To reframe health from the poverty reduction focus of the MDGs
2. To embrace the social sustainability
3. To construct universal sustainable developmental goals (SDGs).

Moreover it has been stressed that good strategic actions must also incorporate a **human rights approach** to women’s health. These includes accountability, participation, ownership, transparency, equity and non-discrimination.

Sustainable and continued support for women’s health needs a collective action to develop.

CHAPTER 10

Drug Therapy, Charts, Illustrations and Medications

- **Drug Therapy, Teratogenicity**
- **Charts**
- **Illustrations**
- **Tables**

DRUG THERAPY IN PREGNANCY AND TERATOGENECITY

FOOD AND DRUG ADMINISTRATION FETAL RISK CATEGORIES

| Category | Definitions |
|--|--|
| A | Well-controlled studies in pregnant women have failed to demonstrate a fetal risk |
| B | No evidence of risk in humans: Well-controlled studies in pregnant women have not shown any increased risk of fetal malformation despite adverse findings in animals. The chance of fetal harm is remote but remains a possibility |
| C | Risk cannot be ruled out: Adequate, well-controlled human studies are lacking. Animal studies have shown a risk to the fetus or are lacking as well. Potential benefit may outweigh the risk |
| D | Positive evidence of risk: Studies in human have demonstrated fetal risk. Potential benefits from use of the drug (life-threatening situation) may outweigh the potential risk |
| X | Contraindicated in pregnancy: Proven fetal risks clearly outweigh any possible benefit. Drugs in this group are: Alcohol, ACE inhibitors, lithium, methotrexate, valproic acid, mifepristone, danazol, isotretinoin, radioactive iodine and others |
| Teratogen information data bases: Organization of Teratology Information Services (OTIS): http : #www.otispregnancy.org . | |

MEDICATIONS CATEGORIZED AS CATEGORY X

| | |
|--|---|
| <ul style="list-style-type: none">• Aminopterin• ACE inhibitors• Coumarin derivatives• Cyclophosphamide• Danazol• Diethylstilbestrol• Ethanol• Etretinate• Flurazepam• Isotretinoin | <ul style="list-style-type: none">• Leuprolide• Lithium• Methotrexate• Mifepristone/Misoprostol• Phenytoin• Quinine• Radioactive iodine• Temazepam• Trimethadione• Valproic acid |
| Food and Drug Administration: Drug bulletin. Fed Reg. 1980;44:37434. | |

TERATOGENS KNOWN TO CAUSE MALFORMATIONS

| Infections | Drugs & Chemicals | Physical Agents |
|--|--|---|
| Viruses <ul style="list-style-type: none">♦ Rubella♦ Cytomegalovirus♦ Parvovirus B19♦ Herpes♦ Varicella | <ul style="list-style-type: none">♦ Phenytoin♦ Tetracyclines♦ Valproic acid♦ Alcohol♦ Folate antagonist♦ Androgen hormones♦ Carbamazepine♦ Vitamin A excess♦ Coumadin anticoagulants | <ul style="list-style-type: none">♦ Ionising radiation♦ Lead♦ Mercury |
| Others <ul style="list-style-type: none">♦ <i>Toxoplasma</i>♦ <i>Treponema pallidum</i> | | |

Q. What is a teratogen?

Ans. **Teratogens** are substances that can cause fetal abnormalities in relation to structures, functions, growth restriction and/or death. A teratogen may be a substance, an organism or a physical agent.

Q. Mention some of the known teratogens to cause birth defects.

Ans. **Known Teratogens to Cause Congenital Fetal Malformations and Birth defects are:**

1. **Genetic:** 15–20%
2. **Chromosomal Abnormalities** ♦ 5–10%

| | | |
|-------------------|---|---|
| Aneuploidy | } | ♦ Down syndrome ♦ Edward syndrome ♦ Turner syndrome |
|-------------------|---|---|
3. **Environmental Causes**
 - a. Maternal infections: 1–3%
 - b. Maternal abuse of illicit Substances: 1–4%
 - c. Drugs, Chemicals, Radiation and Hyperthermia: 1–2%
4. **Unknown:** 65%

Q. What are the different antiepileptic drugs associated with birth defects?

Ans. It is not certain whether the risk of fetal malformations is secondary to the underlying seizure pathology (epilepsy) or due to the exposure of medications. As regard the drugs, available data are limited. This is especially with the newer anti convulsants.

Q. What should be the guideline for the use of antiepileptic drug in pre-pregnancy and in pregnancy?

- A. The drug must be effective for seizure control
- B. Monotherapy to be maintained if possible
- C. Drug has least teratogenic effect
- D. Lowest dose as possible to maintain

DIFFERENT ANTIEPILEPTIC DRUGS AND FETAL MALFORMATIONS

| Drug | Estimated incidence (%) | Pregnancy Category (US-FDA) |
|----------------------|--------------------------------|------------------------------------|
| Valproate | 10.7 | D |
| Carbamazepine | 4.7 | D |
| Phenytoin | 7.3 | D |
| Phenobarbital | 4.9 | D |
| Lamotrigine | 2.9 | C |
| Levetiracetam | — | C |
| Topiramate | — | C |
| Oxcarbazepine | — | C |

OBSTETRIC CHARTS AND GRAPHS

FETAL GROWTH PARAMETERS AND CHARTS

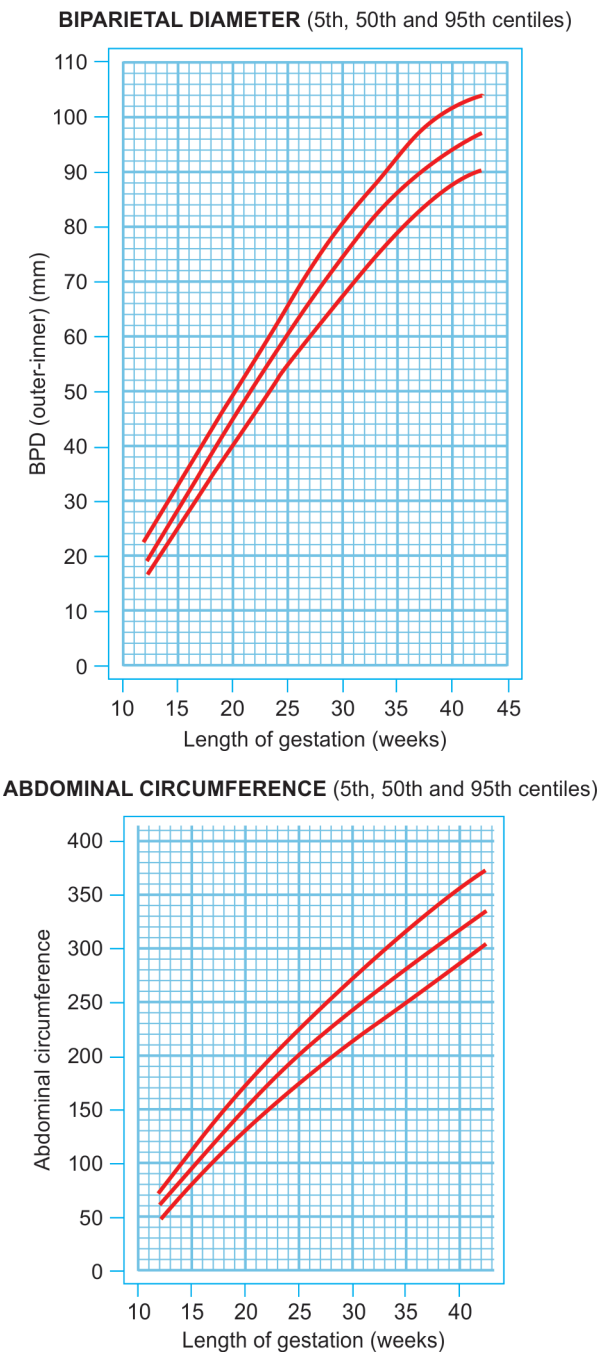


Fig. 10.1: Ultrasonographic growth pattern of a normal fetus

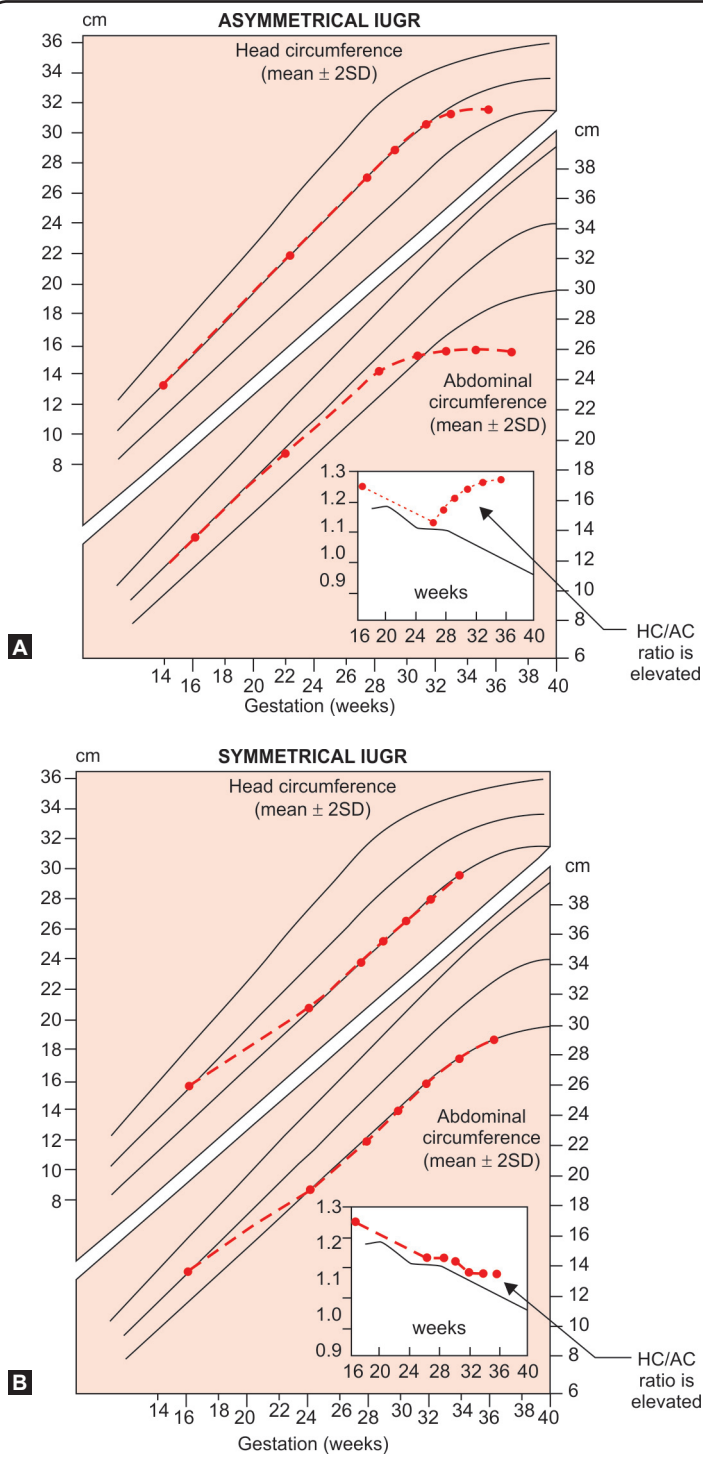


Fig. 10.2: (A) Ultrasonographic growth profile in a case of asymmetric IUGR shows, head circumference (HC) is maintained but abdominal circumference (AC) falls off around 30 weeks. The HC/AC ratio is elevated. (B) In symmetric IUGR, both the HC and AC are affected early. Therefore, HC/AC ratio remains normal

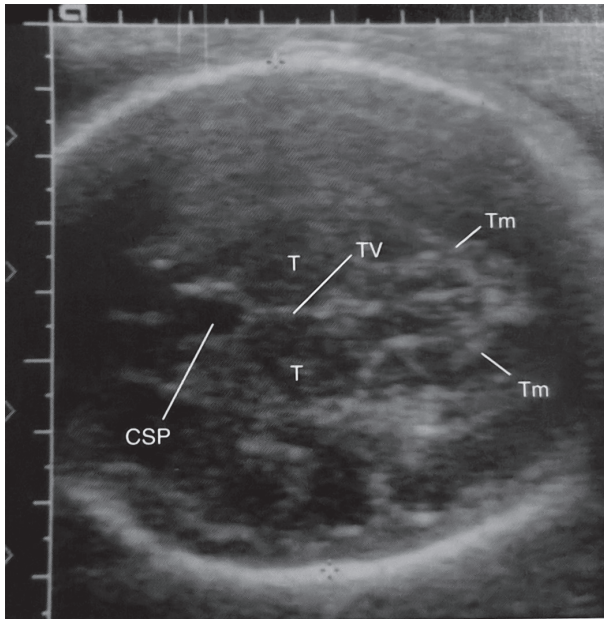


Fig. 10.3: Biparietal diameter (BPD) is measured at the level of thalami (T) and cavum septum pellucidum (CSP). This is done from the outer edge of the skull to the opposite inner edge (parietal bone) and on a line perpendicular to the midline. BPD is measured to assess: (i) fetal gestational age (most accurate between 12 and 18 weeks); (ii) fetal growth and (iii) fetal weight. Head circumference is also measured by placing the dots (electronic callipers)

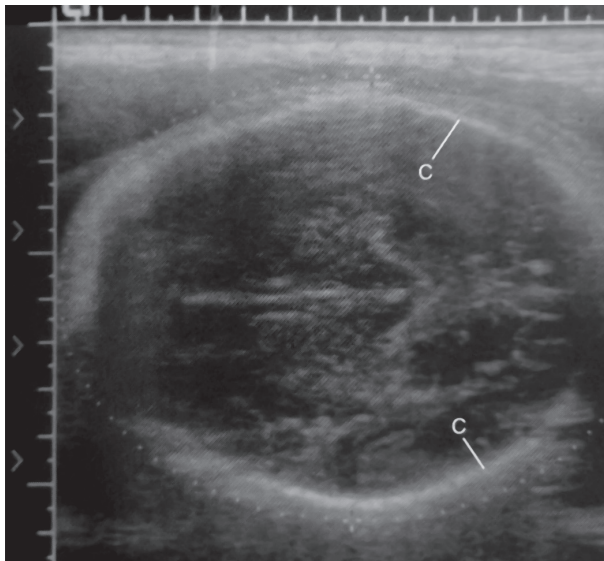


Fig. 10.4: Measurement of head circumference. The transaxial plane of section is nearly the same as that of BPD. Callipers tracing dots are seen. Indications of measurement are the same as that of BPD. (C = cranium)

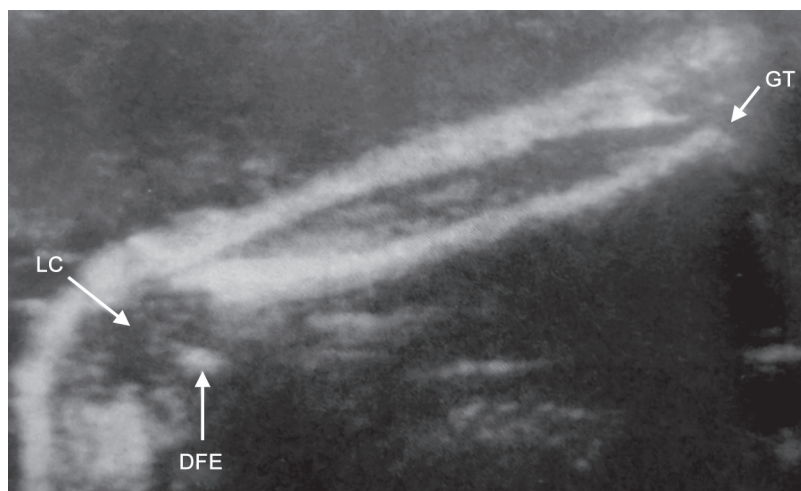


Fig. 10.5: Sonographic view of the fetal femur (femur length) GT = greater trochanter; LC = lateral condyle; DFE = distal femoral epiphysis

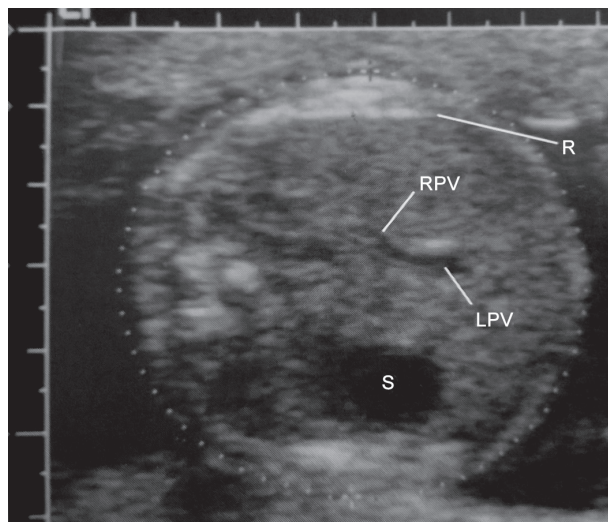


Fig. 10.6: Fetal abdominal circumference (AC) is measured at the level of umbilical vein (UV). Umbilical vein is seen within the substance of the liver. Dots have been placed to make this measurement. AC is measured to assess — (i) gestational age; (ii) IUGR; (iii) macrosomia and (iv) fetal weight. Fetal stomach is demonstrated by S. R = Rib; S = Stomach; PV = Portal Veins

CRITICAL PERIODS IN EMBRYONIC DEVELOPMENT

| Postconception days | Important events in development |
|---------------------|---------------------------------|
| 1 | — |
| 5–7 | Implantation |
| 24–25 | Anterior neuropore closes |
| 26–27 | Posterior neuropore closes |
| 27–28 | Upper limb buds |
| 29–30 | Lower limb buds |
| 46–47 | Heart septations |
| 56–58 | Palate closes |
| 84 | Second trimester |

The classic teratogenic period is from day 31 after the LMP (28 day cycle) to 71 days

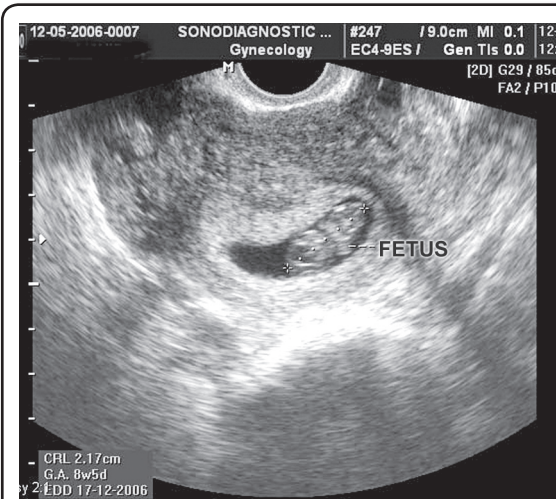


Fig. 10.7: Ultrasonogram showing crown-rump length (between the crosses) of a 8-0 week fetus. [By courtesy: Prof. BN Chakravorty and Dr (Mrs) S Ghosh, IRM, Calcutta]

**Fetal structures visualized by
ultrasonography (TVS) and
gestational age**

| Gestational age (weeks) | Structures visualized |
|-------------------------|--|
| 4 weeks and 3 days | Gestational sac |
| 5 weeks | Yolk sac |
| 6 weeks | Fetal pole, cardiac activity |
| 7 weeks | Upper limb buds, physiological midgut herniation |
| 8 weeks | Lower limb buds, stomach |
| 9 weeks | Spine, choroid plexus |

**Gestational age assignment by
ultrasonography**

| Parameter | Gestational age (weeks) | Variability (days) |
|---------------------------|-------------------------|--------------------|
| Crown-rump length (CRL) | 5-12 | ± 03 |
| Biparietal diameter (BPD) | 12-20 | ± 08 |
| | 20-24 | ± 12 |
| | > 32 | ± 21 |
| Femur length (FL) | 12-20 | ± 07 |
| | > 36 | ± 16 |

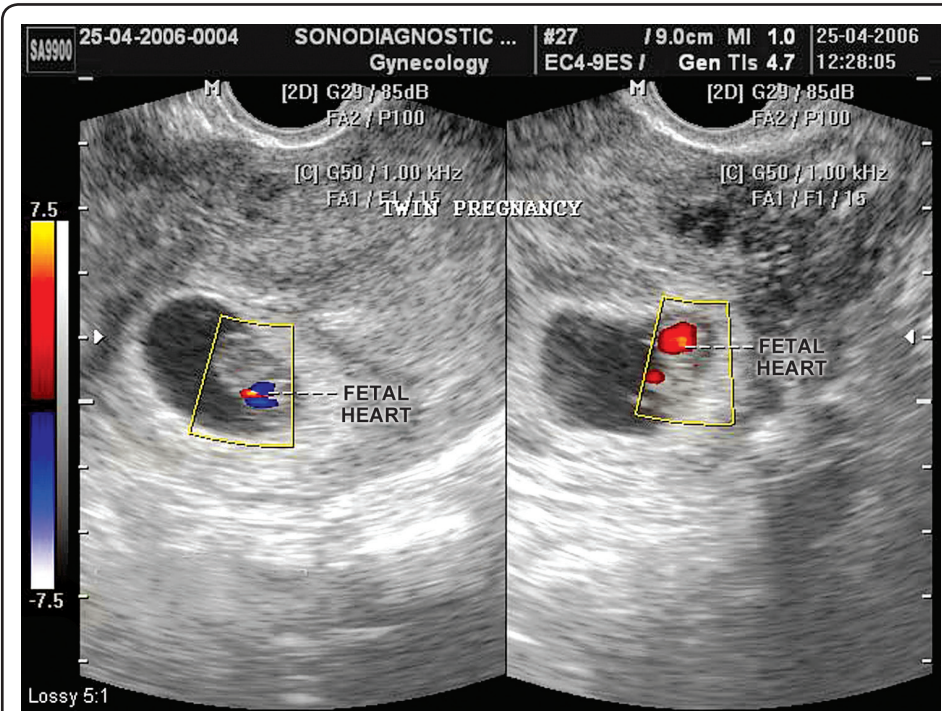


Fig. 10.8: Color Doppler scan (TVS) showing twin pregnancy with cardiac activity of both the fetuses [By courtesy: Prof. BN Chakravorty and Dr (Mrs) S Ghosh, IRM, Calcutta]

SPACE FOR NOTES

SECTION

2

GYNECOLOGY

- **Gynecology Case Discussion**
- **Special Topics**
- **Gynecology Short Questions**
- **Viva-Voce in Gynecology**
- **Operative Gynecology**
- **Practical Gynecology**
- **Single Best Answer and Multiple Choice Questions**
- **History in Obstetrics and Gynecology**

- | | |
|------------------|--|
| Case – 1 | Fibroid Uterus |
| Case – 2 | Ovarian Tumor |
| Case – 3 | Pelvic Organ Prolapse |
| Case – 4 | Genitourinary Fistula |
| Case – 5 | Ureteric Injury in Gynecology |
| Case – 6 | Recto-Vaginal Fistula |
| Case – 7 | Old Complete Perineal Tear |
| Case – 8 | Pelvic Infections |
| Case – 9 | Genital Tuberculosis |
| Case – 10 | Abnormal Uterine Bleeding (AUB) |
| Case – 11 | Hydatidiform Mole |
| Case – 12 | Uterine Polyp |
| Case – 13 | Infertility |

Chapter Objectives

To demonstrate the knowledge and understanding of

- Benign gynecological diseases.
- Infections of the genital organs including STIs.
- Functional anatomy of the perineum, other pelvic organs, colon, rectum and urinary bladder.
- Functional anatomy of the pelvic floor muscles, fascia and the ligaments.
- Neoplastic (both benign and malignant) gynecological conditions.
- To organize investigations and to interpret the results of investigations.
- Principles of medical/surgical management of gynecological problems.

OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE)

CASE – 1 FIBROID UTERUS

Case Summary

Mrs DK 45-year-old multiparous lady presents with the history of heavy, painful and irregular menstruation for the last 18 months. On examination she was pale. Abdominal and pelvic examination revealed an irregularly enlarged firm mass arising from the uterus of about 14 weeks in size. The adnexae were unremarkable. Her recent cervical smear was normal.

Q. What is the provisional diagnosis ?

Ans. Fibroid uterus.

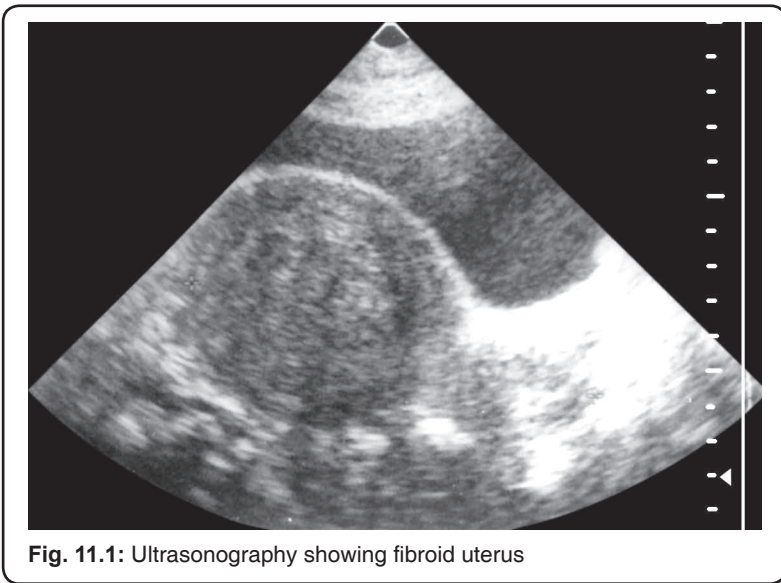


Fig. 11.1: Ultrasonography showing fibroid uterus

Q. How can you confirm the diagnosis?

Ans. Ultrasound scan (Fig. 11.1).

Q. What other symptoms and signs she may have presented with?

Ans. Symptoms due to anemia: Tiredness, palpitation. Other symptoms like abdominal pain, pelvic pressure and symptoms due to degeneration.



Fig. 11.2: Uterus is cut open to show the fibroid (interstitial)

Q. What are the different types of uterine fibroid?

Ans. According to the site of origin, fibroids may be — (A) Body (corporeal) and (B) Cervical. Each type has been subdivided further, (see Fig. 11.3).

Q. What are the different secondary changes in fibroids ?

Ans. (a) Degenerations: (i) Hyaline (65%), (ii) cystic (5–10%), (iii) fatty, (iv) calcareous and (v) red (carneous degeneration), (b) Atrophy, (c) necrosis, (d) infection, (e) vascular changes and (f) sarcomatous changes (0.1%).

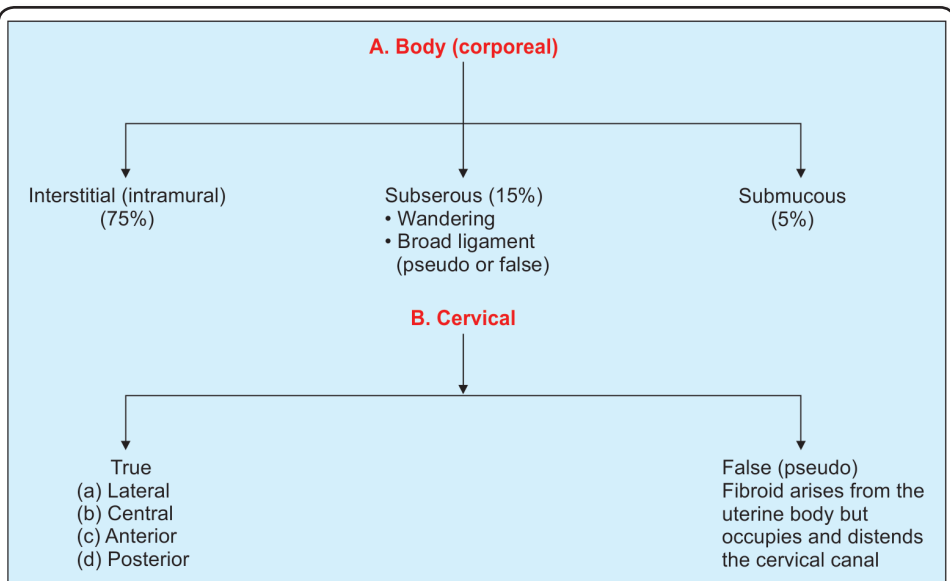


Fig. 11.3: Classification of fibroid

Q. What are the complications of fibroid?

- Ans.** (a) Degeneration (mentioned before)
- (b) Infection
- (c) Torsion of a pedunculated fibroid
- (d) Persistent menorrhagia → Anemia
- (e) Hemorrhage
- (f) Polycythemia
- (g) Sarcomatous change (0.1%).

Q. What are the presenting symptoms?

- Ans.** (a) Menstrual abnormalities:
- (1) Menorrhagia
 - (2) Metrorrhagia
 - (3) Dysmenorrhea
- (b) Infertility
- (c) Pain lower abdomen
- (d) Lump abdomen
- (e) Problems during pregnancy: Miscarriage, preterm labor, IUGR.
- (f) Pressure symptoms (more in cervical fibroid)
- Urinary symptoms — Dysuria, Retention
 - Bowel symptoms — Constipation
 - Ureteric compression (rare) — Hydroureter
 - Others — Edema legs.

Q. What is the important observation during bimanual examination that can differentiate a fibroid uterus from an ovarian tumor?

Ans. In a case of fibroid uterus:

- (i) The uterus is irregularly enlarged and the feel is firm to hard.
- (ii) Uterus is not felt separately from the mass and no groove is felt between the uterus and the mass.

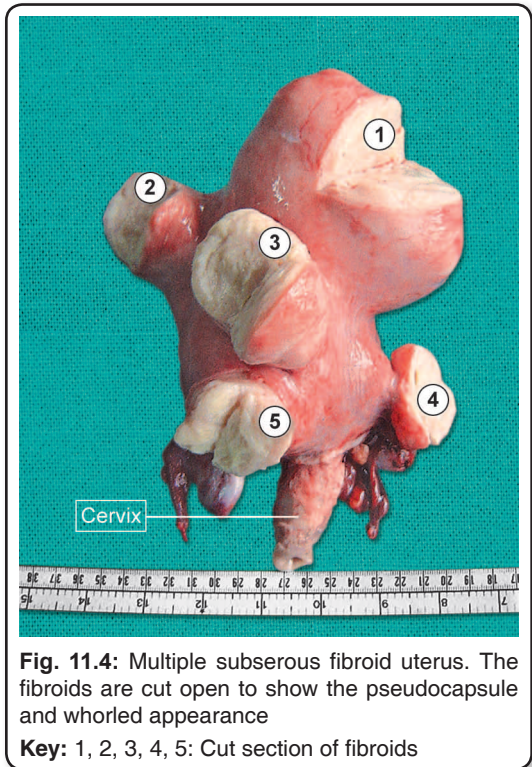


Fig. 11.4: Multiple subserous fibroid uterus. The fibroids are cut open to show the pseudocapsule and whorled appearance

Key: 1, 2, 3, 4, 5: Cut section of fibroids

(iii) The cervix moves when the tumor is moved per abdomen and vice versa.

Q. Give an outline of management of a case of fibroid uterus.

Ans. Management options depend on the following factors: a) Age, b) Presence of symptoms, c) Need of child bearing d) Presence of any complications: **Management options available are:** A. Conservative (observation), B. Medical C. Surgery for myomectomy (conservative) or Hysterectomy. Surgery may be by Laparotomy or by Laparoscopy.

Q. What is the place of medical management of fibroid uterus? What are the different agents used ?

Ans. Medical management may be done in a few cases to improve the symptoms temporarily. Improvement of menorrhagia, anemia or pain could be there. **Commonly used drugs are:** Progestogens, danazol, antiprogestogens, GnRH analogues (agonists and antagonists).

Q. What are the different types of surgery that can be done for fibroid uterus?

Ans. A. Open surgery — (Laparotomy)

(a) Myomectomy — Enucleation of fibroid (myoma) from the uterus and the uterus is preserved.

(b) Hysterectomy.

B. Endoscopic surgery

(a) Laparoscopy: ■ Myomectomy ■ Myolysis (using Laser)

(b) Hysteroscopy: ■ Resection of a submucous myoma

C. Others — Uterine artery embolization.

Q. What is the treatment of choice for this patient (presented above)?

Ans. Total abdominal hysterectomy with or without bilateral salpingo-oophorectomy (TAH and BSO). Oophorectomy should be done with woman's consent following counselling of risks and benefits.

Q. What is the rationale behind the treatment (TAH and BSO)?

Ans. This 45-year-old parous lady with a large fibroid was suffering from menorrhagia for a long time. Such a fibroid is unlikely to respond to medical therapy. Considering the risk of recurrence of myoma and the risk of recurrence of menorrhagia, myomectomy may not be a good option for this patient at this age.

Q. Why are the normal ovaries removed during hysterectomy?

Ans. Benefits of oophorectomy are:

(i) Protection against ovarian cancer (100%). Overall risk of ovarian carcinoma is less than 1% by the age of 70 years.

(ii) It reduces the risk of another laparotomy for chronic pelvic pain due to trapped ovarian syndrome (residual ovarian syndrome) or ovarian cyst formation, the overall risk of which is about 5–10%.

- (iii) The conserved ovaries following hysterectomy lose their function soon due to interference with their blood supply during hysterectomy. There is early onset of menopause by 3–4 years. So the purpose of ovarian conservation is lost.
- (iv) Moreover prophylactic oophorectomy protects against breast cancer (50%).

Risks of prophylactic oophorectomy are: Onset of premature (surgical) menopause and other health hazards (osteoporosis, ischemic heart disease). Psychological morbidities (irritability, mood swing, insomnia and depression) are also there. However, such a difficulty could be overcome by estrogen replacement therapy (ERT). Estrogen replacement therapy (ERT) is given in low doses (0.3 mg conjugated equine estrogen) and for short-term basis (5 years).

Q. In a patient aged 30 years with a smaller fibroid, what other options she could have?

Ans. Treatment options for the young woman with a smaller size fibroid.

- ♦ Observation when there is no symptom.
- ♦ Medical therapy — Progestins, danazol, GnRH analogues.
- ♦ Surgical — Myomectomy either by laparotomy, laparoscopy or by hysteroscopic resection (submucous variety).
- ♦ Embolization (embolotherapy) of uterine arteries.
- ♦ Dessication (myolysis) of leiomyoma using laser has also been tried.

CASE – 2 OVARIAN TUMOR**Case Summary**

Mrs PD 20-year-old, newly married woman presents herself in the emergency with lower abdominal pain and heaviness. She was examined to have a cystic pelvic abdominal mass. She was considered for emergency laparotomy. The findings are shown in the Fig. 11.5. The uterus and the other ovary looked normal.

Q. What is the diagnosis?

Ans. Twisted ovarian cyst.

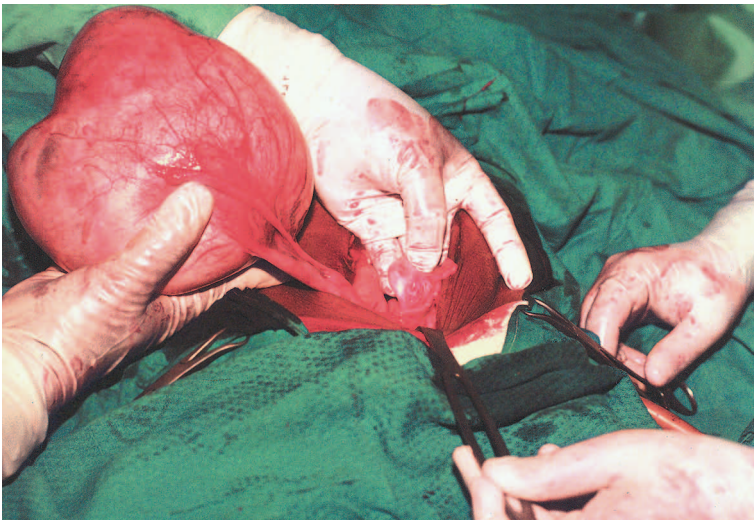


Fig. 11.5: Laparotomy showing ovarian tumor (right)

Q. What are the differential diagnoses?

Ans. ■ Fibroid uterus ■ Chocolate cyst ■ Pregnancy ■ Full bladder
■ Mesenteric cyst (Fig. 11.6) ■ Encysted tuberculosis

Q. What investigations would have been done had she not been in acute pain?

Ans. Ultrasonography

She had an ultrasonography done before coming to the hospital. USG revealed the picture as shown in Fig. 11.7.

Q. What surgical treatment should be appropriate for her ?

Ans. Ovarian cystectomy if ovarian tissue could be salvaged. Ovariectomy or oophorectomy — alternatively.

In either case tissue should be sent for histological diagnosis.

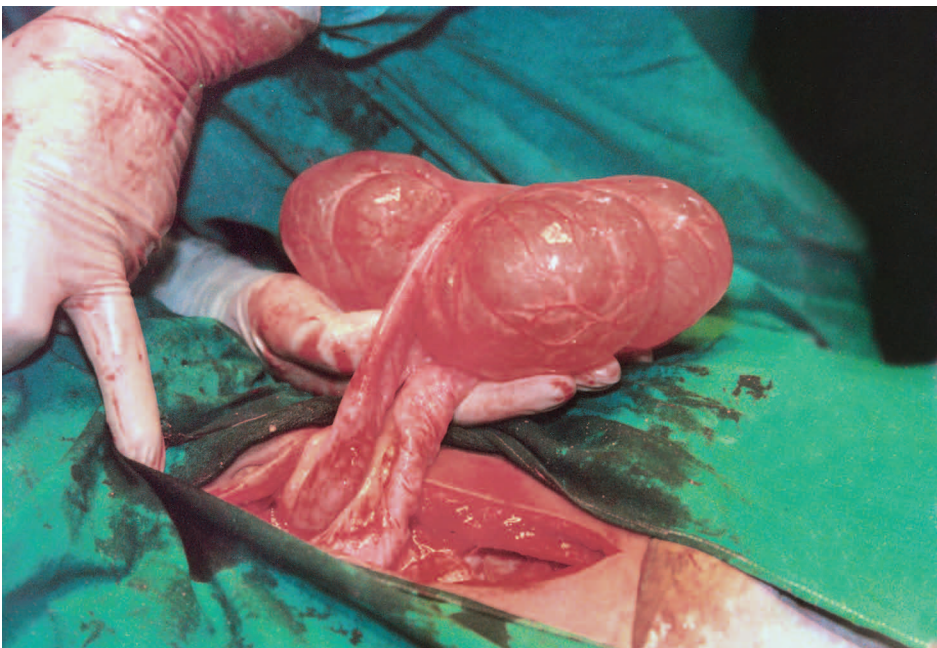


Fig. 11.6: Mesenteric cyst in a young woman who presented herself with the features of a twisted ovarian tumor

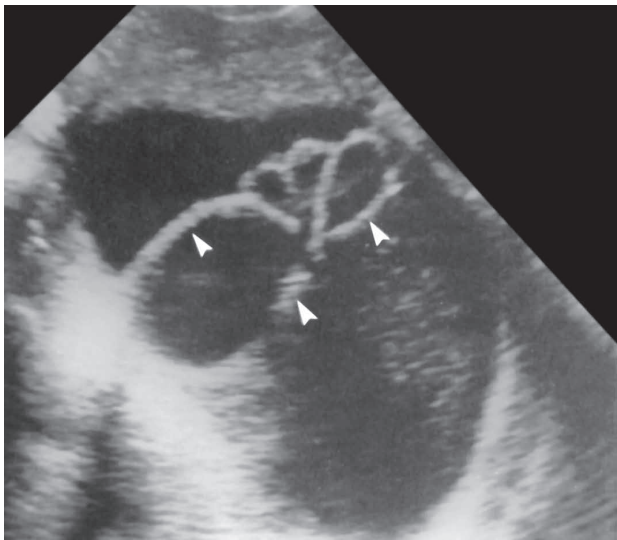


Fig. 11.7: Ultrasonographic view of ovarian tumor showing septations (arrow)



Fig. 11.8: Torsion of the left ovarian cyst

Q. What are the common ovarian tumors in this age group ?

Ans. Germ cell tumors — of which dermoid cyst is common. Others are **epithelial cell tumors** — serous cystadenoma or mucinous cystadenoma.

Q. What are the complications of benign ovarian tumor ?

Ans. (i) Torsion (Fig. 11.8)
(ii) Intracystic hemorrhage
(iii) Infection
(iv) Rupture
(v) Pseudomyxoma peritonei
(vi) Malignancy.

Q. What are non-neoplastic cysts of the ovary ?

Ans. (a) Follicular cysts
(b) Corpus luteum cyst
(c) Theca lutein and granulosa lutein cyst
(d) Polycystic ovarian syndrome (PCOS)
(e) Endometrial cyst (chocolate cyst)

Q. What are the features of a functional cyst ?

Ans. (a) Usually < 8 cms in diameter
(b) Regresses spontaneously
(c) Unilocular
(d) Usually contains clear fluid.
(e) Usually without any complication.



Fig. 11.9: Bilateral malignant ovarian tumor

Q. Mention some of the common tumors of the ovary and their histogenesis?

Ans. A. Epithelial tumor (70–80%)

- (a) Serous cystadenoma
- (b) Mucinous cystadenoma
- (c) Endometrioid tumors.

B. Germ cell tumors of the ovary (15–20%)

- (a) Dysgerminoma
- (b) Endodermal sinus cell tumor
- (c) Choriocarcinoma
- (d) Teratoma : (i) Immature and (ii) mature (dermoid).

C. Sex cord stromal tumors (3–5%)

- (a) Granulosa cell tumor
- (b) Theca cell tumor
- (c) Sertoli cell tumor
- (d) Leydig cell tumor
- (e) Fibroma.

D. Others — unclassified.

E. Secondary metastatic tumor (Krukenberg's tumor).

Q. How can you differentiate a benign ovarian tumor from a malignant one clinically during examination as well as during laparotomy (Fig. 11.9)?

Ans. Features suggestive of malignancy for an ovarian tumor during clinical examination are:

- (a) Tumor—Bilateral
- (b) Mobility—Restricted or fixed
- (c) Feel—Solid/variagated
- (d) Surface—Irregular
- (e) Ascites—Present
- (f) Nodules in POD—Present.

Features suggestive of malignancy of an ovarian tumor during laparotomy are:

- (a) Ascites—Present and often it is hemorrhagic
- (b) Tumor on cut section; solid with hemorrhagic areas
- (c) Peritoneal and/or omental metastatic deposits—Present.

Q. What is Meig's syndrome ?

Ans. Presence of ascites, right-sided hydrothorax (pleural effusion) in association with the presence of an ovarian tumor like fibroma, thecoma, Brenner or Granulosa cell tumor is called Meig's syndrome.

Q. On bimanual examination how can you differentiate an ovarian tumor from a fibroid uterus?

- Ans.**
- (a) The mass is felt separately from the uterus.
 - (b) A groove is felt between the mass and the uterus.
 - (c) On moving the mass per abdomen the cervix does not move.
 - (d) The lower pole of the mass can be felt through the fornix.

Q. What is pseudomyxoma peritonei?

Ans. It is a condition of mucinous ascites usually secondary to mucinous tumors. It is often associated with mucinous cyst adenoma of the ovary, mucocoele of the appendix, gall bladder and also with intestinal malignancy.

Q. What are the guidelines for surgery during laparotomy for such a case of ovarian tumor?

- Ans.**
- (i) A vertical incision is made.
 - (ii) Peritoneal fluid if present is aspirated otherwise peritoneal washings with normal saline is collected and sent for cytology.
 - (iii) The ovarian tumor is explored and nature (benign or malignant) is noted. (See discussion above).
 - (iv) Exploration is done for the other ovary, pelvic organs, omentum, liver, under surface of the diaphragm and the periaortic group of lymph nodes for any metastatic deposits.

Q. What are the different types of surgery that can be done in a case of benign ovarian tumor? What are the factors considered before such an operation?

Ans. The important factors considered are:

- (i) Age of the patient and her desire for future childbearing.
- (ii) Amount of healthy ovarian tissue available during surgery for preservation.
- (iii) Any high-risk factor for ovarian malignancy.

Different types of surgery are:

In a **young patient** (i) ovarian cystectomy or (ii) ovariectomy.

In **parous women with age 40 years or above.**

- (iii) Total hysterectomy with bilateral salpingo-oophorectomy is done.

Q. What is the common malignant tumor of the ovary ?

Ans. Malignant epithelial tumors are the most common (90%).

Q. What is Krukenberg tumor of the ovary ?

Ans. It is a metastatic variety of malignant ovarian tumor.

Q. What are the common primary sites for Krukenberg's tumor ?

Ans. Stomach, large bowel, breast and gallbladder.

Q. What are the histological characteristics of a Krukenberg's tumor ?

Ans. see p 540

Q. What are the different modes of spread in a case of epithelial carcinoma of the ovary ?

Ans. (i) Transcelomic, (ii) direct, (iii) lymphatics and (iv) blood borne.

Q. What is the importance of age in relation to ovarian tumor ?

Ans. Ovarian tumor can be observed at any age of a woman. Practically no age is immune to ovarian tumor (benign or malignant). However, nearly 60% of ovarian neoplasms found in the postmenopausal women are malignant.

Germ cell tumors of the ovary are commonly seen in the young and adolescent girls (14–20 years of age).

Q. What are the common symptoms of ovarian tumors?

Ans. (i) Majority are asymptomatic.

(ii) Heaviness in lower abdomen.

(iii) A gradually increasing abdominal mass.

(iv) Pain in lower abdomen.

(v) Respiratory distress (mechanical).

(vi) Usually no menstrual abnormality.

Other symptoms are more common when there are malignant changes.

- Dyspepsia, and flatulence.
- Loss of appetite.
- Appearance of abdominal pain and tenderness.
- Rapid rate of tumor growth.
- Loss of body weight.

Q. Who are the high-risk women for developing ovarian malignancy?

Ans. (a) Age of the woman, 40–60 years

(b) History of familial cancers (ovarian and breast)

(c) Postmenopausal palpable ovary.



Fig. 11.10: Candidate performs clinical examination to measure the dimensions of a pelvic abdominal mass

Q. What are the protective factors for ovarian malignancy?

Ans. (a) Combined oral contraceptive pill use
(b) Pregnancy
(c) Breastfeeding.

Q. What is the place of prophylactic oophorectomy while doing hysterectomy?

Ans. see p 319

Q. What are the different modes of therapy in a case of malignant ovarian tumor?

Ans. (i) Surgery (first choice)
(ii) Chemotherapy
(iii) Radiotherapy
(iv) Combination therapy.

Q. What are the different types of surgery that can be done in the management of a case with malignant ovarian tumor.

Ans. (a) Total hysterectomy with bilateral salpingo-oophorectomy, infracolic omentectomy and sampling of para-aortic lymph nodes.

- (b) Cytoreductive surgery (debulking procedure).
- (c) Biopsy.
- (d) Unilateral salpingo-oophorectomy.

Q. What are the common chemotherapeutic agents used in the management of epithelial ovarian cancer?

Ans. A. Single agent

- (a) Platinum compounds — Carboplatin and cisplatin
- (b) Taxane compounds — Paclitaxel and docetaxel
- (c) Alkylating agents—Ifosfamide and Cyclophosphamide

B. Combination chemotherapy

- (a) Carboplatin and paclitaxel
- (b) Cisplatin and paclitaxel
- (c) CAP (cyclophosphamide, adriamycin and cisplatin).

Q. Name some hormone producing tumors of the ovary.

Ans. Sex cord stromal tumor are known as 'functioning tumors' of the ovary as they produce hormones.

A. Estrogen producing tumors

- Granulosa cell tumor
- Theca cell tumor

B. Androgen producing tumors

- Sertoli cell tumor
- Leydig cell tumor.

CASE – 3 PELVIC ORGAN PROLAPSE**Case Summary**

Mrs PL 53-years old, multiparous lady presents with the problem of descent of her uterus. She has also some amount of backache and dragging feel in the vagina and walking difficulty. Examination revealed the findings (Fig. 11.11).

Q. What is the diagnosis ?

Ans. Genital prolapse.

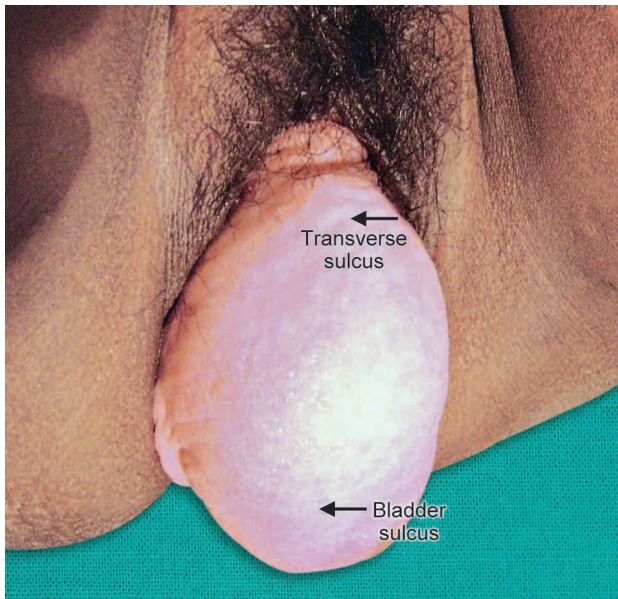


Fig. 11.11: Genitourinary prolapse. There are three sulci on the anterior vaginal wall. Transverse vaginal sulcus is situated at the junction of urethrocele above and the cystocele below. The bladder sulcus is at the level of attachment of anterior vaginal wall to the cervix. See also Fig. 11.13A, 11.13B

Q. What are the degrees of uterine prolapse ?

Ans. There are three degrees of prolapse (see Figs 11.12, 11.13A and B).

- (i) *First degree*—Slight uterine descent (from its normal anatomical position) but the external os remains inside the vagina.
- (ii) *Second degree*—Cervix is outside but uterine body is inside the introitus.
- (iii) *Third degree*—Uterine body remains outside the introitus.

The other commonly used grading system is **Barden and Walker (1972) :**

- ♦ **Grade I** : Descent of any genital organ half-way to the hymen
- ♦ **Grade II** : Descent upto the hymen
- ♦ **Grade III** : Descent half-way past the hymen
- ♦ **Grade IV** : Complete eversion of vagina.

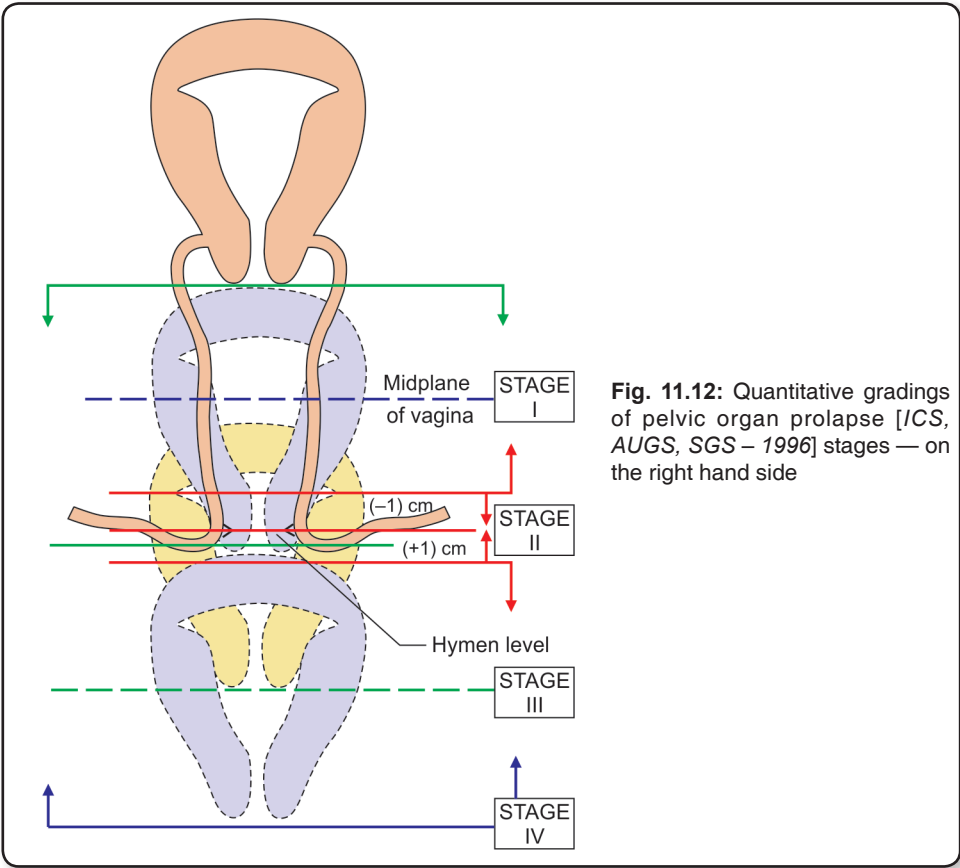


Fig. 11.12: Quantitative gradings of pelvic organ prolapse [ICS, AUGS, SGS – 1996] stages — on the right hand side

Q. Is there any other classification of genitourinary prolapse?

Ans. The newer classification is POP-Q classification

| Pelvic Organ Prolapse Quantitative (POP-Q) Scoring | |
|--|---|
| Stage | Description |
| 0 | No descent of pelvic organs |
| I | Leading edge of the prolapse does not descend below 1 cm above the hymenal ring |
| II | Leading edge of the prolapse extends from 1 cm above to 1 cm below the hymenal ring |
| III | Extending from 1 cm beyond the hymenal ring but without complete vaginal eversion |
| IV | Essentially complete eversion of vagina |

Q. What are the urinary and other symptoms in a case of genitourinary prolapse?

Ans.

| Urinary symptoms | Other gynecological symptoms |
|---|--|
| <ul style="list-style-type: none"> • Dysuria • Incomplete evacuation • Urgency and frequency • Pain during voiding • Stress urinary incontinence • Retention of urine | <ul style="list-style-type: none"> • Vaginal fullness • Mass coming out of vagina • Low backache • Bowel — Constipation • Vaginal — Discharge/bleeding • Dyspareunia |

Q. What other associated pathological conditions must be looked for during examination?

Ans. Abdominal and pelvic examination for any pelvic mass, urinary incontinence, cystocele, rectocele, enterocele or decubitus ulcer.

Q. What are the different types of anterior vaginal wall prolapse ?

Ans. (i) Upper 2/3rd – Cystocele
 (ii) Lower 1/3rd – Urethrocele
 (iii) Combined – Cystourethrocele.

Q. What is a decubitus ulcer?

Ans. It is a trophic ulcer found at the dependent part of the prolapsed mass lying outside the introitus.

Q. What is the change in the vaginal and in the supravaginal part of the cervix?

Ans. **Vaginal part** of the cervix is congested and may become infected. It may be bulky (edematous). There may be some blood stained vaginal discharge (decubitus ulcer).

Supravaginal part becomes elongated due to the tug of war between the cardinal ligaments to pull the uterus up and the weight of the uterus that makes it fall down through the vaginal axis.

Q. What are the anatomical changes in the urinary system in a case of genitourinary prolapse ?

Ans. (a) An angulation is developed between the urethra and the bladder. This may cause retention of urine.
 (b) The ureters are dragged downwards. There may be hydroureteric changes.

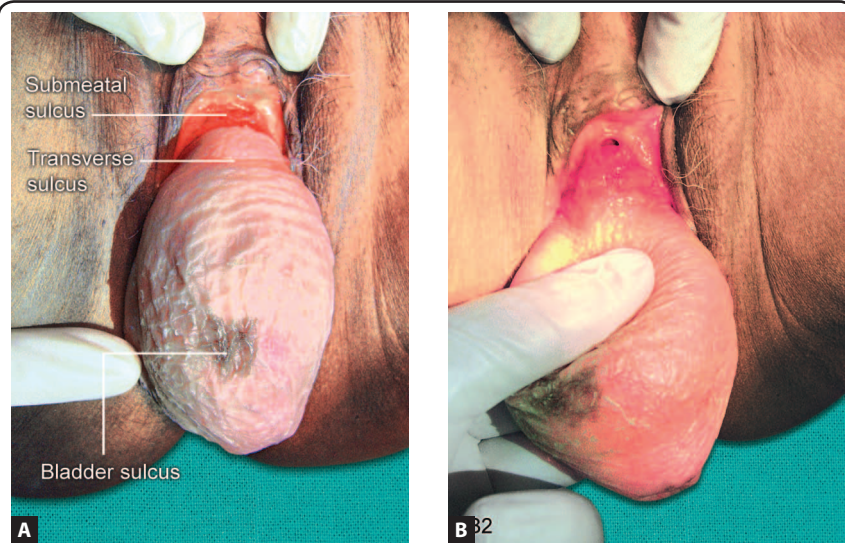


Fig. 11.13A and B: (A) Three sulci on the anterior vaginal wall are marked (pointers); (B) Examination procedure to differentiate second degree prolapse from procidentia

Q. How you can clinically differentiate a third degree uterine prolapse from a second degree one?

Ans. On inspection, in both the degrees of prolapse, the mass protrudes out through the introitus and the leading part of the mass is the external os. But to confirm a third degree prolapse, palpation is essential. The thumb of the left hand is placed anteriorly and the middle and the index fingers are placed posteriorly. The fingers should be placed above the mass and outside the introitus. If the fingers can be apposed, it is a third degree prolapse See Fig. 11.13A and B.

Q. Who are the women that can be treated with pessary?

Ans. Use of pessary gives temporary improvement of symptoms. The conditions are:

- (i) Women not fit for surgery
- (ii) Patient's unwillingness for operation
- (iii) Women while waiting for operation
- (iv) Prolapse in early pregnancy (up to 18 weeks)
- (v) Prolapse in puerperium.

Q. What are the different types of surgery, that can be done in a case with genitourinary prolapse ?

Ans. Several factors are considered before adopting any particular method of

surgery. These are mainly age, parity, need of childbearing, type of prolapse and degree of prolapse. Other factors are women's health status and any other associated pathology (DUB) present or not. **The different types of surgery that are commonly done are:**

- (a) Anterior colporrhaphy.
- (b) Colpoperineorrhaphy.
- (c) Vaginal repair of enterocele with pelvic floor repair (PFR).
- (d) McCall culdoplasty.
- (e) Paravaginal defect repair.
- (f) Vaginal hysterectomy with PFR
- (g) Fothergill's operation.
- (h) Repair of vault prolapse.
- (i) **Vaginal route:** Sacrospinous colpopexy and colpocleisis.

Abdominal route:

- (j) Sacral colpopexy.
- (k) Cervicopexy or sling operations

Q. What is the indication of Fothergill's operation ?

Ans. This is mainly done for a young woman where preservation of the uterus is desired either for reproductive function or for menstrual function. Where childbearing function is not needed (family completed), this operation may be combined with (vaginal/abdominal) sterilization procedure.

Q. What are the composite steps of this Fothergill's operation ?

- Ans.**
- (a) Initial dilation and curettage
 - (b) Amputation of cervix
 - (c) Fixation of Mackenrodt's ligaments in front of the cervix
 - (d) Anterior colporrhaphy
 - (e) Colpoperineorrhaphy.

Q. What is Fothergill's stitch ?

Ans. It is the stitch that fixes the Mackenrodt's ligament to the anterior surface of the cervix to make the uterus anteverted.

Q. What are the complications of Fothergill's operation?

Ans. Complications of Fothergill's operation (see table below):

| | |
|-------------------------|--|
| During operation | <ul style="list-style-type: none"> ♦ Hemorrhage ♦ Injury to the bladder and rectum |
| Post-operative | <ul style="list-style-type: none"> ♦ Retention of urine or cystitis ♦ Hemorrhage—Primary or secondary ♦ Infection |

Contd...

Contd...

| | |
|-------------|--|
| Late | <ul style="list-style-type: none"> ♦ Dyspareunia ♦ Cervical stenosis-hematometra ♦ Infertility ♦ Cervical incompetency ♦ Cervical dystocia in labor |
|-------------|--|

Q. What is the common operation for congenital or nulliparous prolapse ?

Ans. Cervicopexy or sling operation (Purandare's operation).

In this operation the cervix is pulled up abdominally. Strips of rectus sheath or Marlex or Goretex (synthetic) tapes are used.

Q. What are the complications of vaginal hysterectomy with pelvic floor repair operation?

Ans.

Complications may be —

A. During operation: Hemorrhage, trauma to bladder or rectum.

B. Postoperative (early): Retention of urine, Hemorrhage and urinary tract infection.

C. Late: Dyspareunia, recurrence of prolapse.

Q. What factors aggravate genitourinary prolapse ?

Ans.

- (a) Postmenopausal tissue atrophy
- (b) Chronic cough and constipation
- (c) Obesity
- (d) Under nutrition.

Q. What is congenital prolapse?

Ans. Here the prolapse is due to congenital weakness of the supporting structures of the uterus. It is commonly seen in nulliparous women. Congenital prolapse is not associated with cystocele.

Q. What are the important supports of the uterus?

Ans. Supports of the uterus are described in a three tier system.

A. Upper tier : Indirect support to maintain the anteverted position of the uterus.

Supporting structures are :

- Endopelvic fascia ■ Round ligaments
- Broad ligaments with intervening pelvic cellular tissues.

B. Middle tier : Direct and strongest support

- Endopelvic fascia ■ Pericervical ring of fascia
- Mackenrodt's ligaments ■ Uterosacral ligaments
- Pubocervical ligaments

C. Inferior tier — Indirect support

- Pelvic floor muscles (levator ani).
- Levator plate
- Perineal body
- Endopelvic fascia
- Urogenital diaphragm

Q. What important factors are generally considered before deciding the appropriate treatment for prolapse ?

Ans. Age, parity, desire for future childbearing, associated pelvic pathology and assessment of general health.

Q. What treatment options should this woman be offered ?

Ans. For this patient (presented in the case), vaginal hysterectomy with repair of the pelvic floor would be appropriate. If she is unwilling or found unfit for surgery, she may be advised vaginal pessary.

Q. What is levator plate and what is its function ?

Ans. It is a thick band of connective tissue formed by the medial fibers of the two levator ani muscles. It is the anococcygeal raphe extending from the anorectal junction to the coccyx. The anterior fibers encircle the anorectal junction and are inserted in the perineal body.

The levator plate forms a horizontal supportive shelf upon which the rectum, upper vagina and uterus rest. The levator plate thus prevents genital organ prolapse. When levator plate is damaged, the genital organs prolapse

CASE – 4 GENITOURINARY FISTULA

Case Summary

Mrs LF 26-year-old housewife, presented with continuous leakage of urine per vaginam. This she noticed four days past her last childbirth at home. She stated that the labor was difficult and prolonged (2 days). She was delivered by local dais.

Q. What is most likely the diagnosis ?

Ans. Urinary incontinence most likely the vesicovaginal fistula (VVF).

Q. What is a vesicovaginal fistula ?

Ans. It is an abnormal communication between the bladder and the vagina. Urine escapes through this passage into the vagina causing true incontinence.

Q. What are the important causes of VVF ?

Ans. A. Obstetric (commonest: 80–90%):

■ Ischemic ■ Traumatic.

B. Gynecological (10–20%).

Q. What is the pathology of ischemic fistula ?

Ans. See below

Q. What are the different types of urinary incontinences ?

Ans. (i) **Urethral.** (a) Stress incontinence (GSI) (b) Detrusor instability (DI)
(c) Overflow (d) Congenital (epispadias).

(ii) **Extraurethral:** (a) Acquired fistulae (b) Congenital ectopic ureter.

Q. What are the different types of urinary fistula ?

Ans. Bladder: Vesicovaginal (most common), vesicouterine, vesicocervical.

Urethra : Urethrovaginal.

Ureter : Ureterovaginal (common), Ureterouterine (rare).

Q. What could be the possible cause in this case and what is the basic pathology?

Ans. Obstetric fistula due to prolonged labor or obstructed labor. Prolonged compression of the bladder base between the fetal head and symphysis pubis → ischemic necrosis → infection — sloughing → fistula (this pathology usually takes about 3–5 days).

Q. How do you confirm the diagnosis of a vesicovaginal fistula ?

Ans. Examination under anesthesia.

- (i) **Dye test** — Methylene blue dye is introduced into the bladder through a rubber catheter. Dye is seen to come out through the fistula site.
- (ii) **A metal catheter** — Passed through the urethra may be seen to come out through the fistula site (Fig. 11.14).
- (iii) **Three swab test** (see Dutta Gyne 6/e, p 419).
- (iv) **Cystoscopy**—for detection of fistula site and to assess the proximity of the ureteric openings to the fistula site.
- (v) **IVP**—It may be needed to exclude ureterovaginal fistula and also in cases with recurrent urinary tract infection.

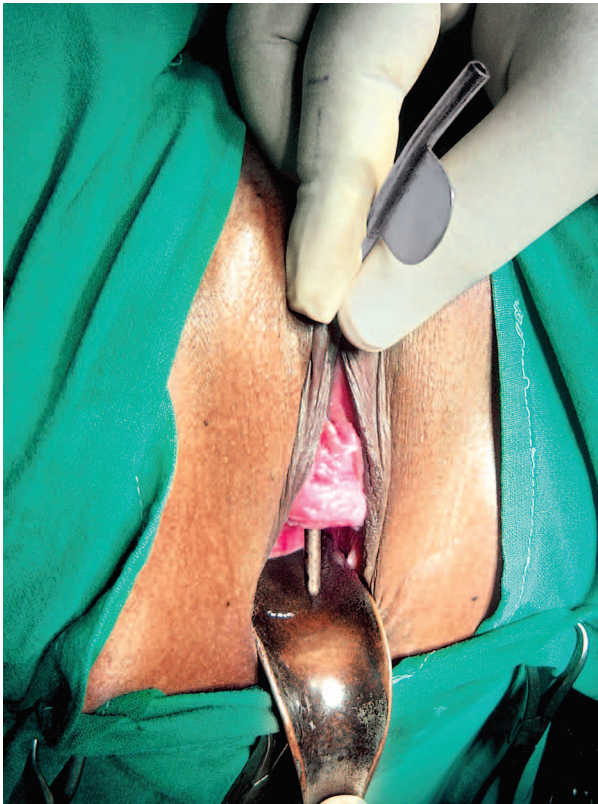


Fig. 11.14: Vesicovaginal fistula at the midvaginal level. The metal catheter is seen to come out through the vagina when introduced per the urethra

Q. When should the repair be done ? What are the different types of repair in a case of vesicovaginal fistula ?

Ans. Repair is done usually 3 months after the delivery.

Following are the different types of VVF repair:

- ♦ Local repair by flap splitting method is commonly done.
- ♦ Edge parring and suturing may be done in a very small fistula.
- ♦ Latzko repair (partial colpocleisis) is done for a fistula (VVF) which is small and situated high in the vagina (following hysterectomy).
- ♦ Sometimes, Martius method of graft (bulbocavernosus muscle and fat) is used when the fistula is big.

Q. Why is a three month delay important for repair ?

Ans. By this time, the local tissues are free from infection and the general health of the patient is improved. Further delay is unnecessary as it will produce more tissue fibrosis and also prolong the misery of the patient.

Q. What are the principal steps of flap splitting method of repair ?

- Ans.**
- (i) Good exposure of the fistula site.
 - (ii) Excision of the scar tissue from the margins of fistula.
 - (iii) Mobilization of the bladder wall from the vagina.
 - (iv) Suturing the bladder wall without tension in two layers (3-0 Vicryl – interrupted stitches). Bladder mucosa is excluded.
 - (v) Apposition of the vaginal wall (1-0 Vicryl – interrupted stitches).
 - (vi) Continuous bladder drainage for 10-14 days.

Q. Mention some of the favorable factors for the successful repair of VVF.

Ans. Favorable factors for successful repair are:

- (i) Fistula site easily accessible
- (ii) Site—Midvaginal
- (iii) Size—Not too big
- (iv) Margins—Not too much fibrosis.

Q. What preoperative assessment is needed before the actual repair?

- Ans.**
- ♦ Assessment of patient's general health.
 - ♦ Fistula status—Site, size, mobility, number, margin as well as the proximity with ureteric openings.

Q. What postoperative care is important for the success of repair?

- Ans.**
- ♦ Continuous bladder drainage for 10–14 days.
 - ♦ Urinary antibiotics.
 - ♦ Patient should pass urine frequently (say 2 hourly) following removal of the catheter.

Q. What advice you would give her during the discharge?

- Ans.**
- ♦ To avoid intercourse for at least 3 months
 - ♦ To defer pregnancy for at least 2 years with the use of contraception
 - ♦ Mandatory supervision and institutional delivery for the next pregnancy
 - ♦ Delivery should be by elective cesarean section.

Q. What is Sims' triad?

Ans. **Marion Sims (1852) of New York** used to repair fistula by his own method using.

- (i) Sims' position (exaggerated left lateral position)
- (ii) Sims' speculum (Fig. 16.2)
- (iii) Silver thread — to suture the fistula margins, [currently replaced by Vicryl or PDS (polydioxanone) suture material].

CASE – 5 URETERIC INJURY IN GYNECOLOGY**Case summary**

Mrs AC 47-year-old lady underwent a difficult abdominal hysterectomy due to severe pelvic endometriosis. She observed leaking of urine through the vagina on the same day of the operation. She had the urge to pass urine and could pass urine normally also.

Q. What is the most likely diagnosis ?

Ans. Ureterovaginal fistula.

Q. How do you confirm the diagnosis ?

Ans. The diagnostic procedures used are:

- (i) IV indigo carmine test
- (ii) Cystoscopy and ureteric catheter introduction
- (iii) Excretory urography.

Q. What are the common sites of ureteric injury during gynecological surgery?

Ans. Ureteric injury may occur more commonly when pelvic anatomy is distorted. Due to the close proximity between the ureter and genital organs, ureteric injury results, specially in the presence of adhesions.

- (i) At the level of infundibulopelvic ligament.
- (ii) Below the level of ischial spine — Close to the uterosacral ligament.
- (iii) The site where the uterine artery crosses the ureter from above.
- (iv) Over the anterior vaginal fornix — Within the ureteric tunnel of Mackenrodt ligament.
- (v) Where ureter enters the bladder.
- (vi) Any congenital malformation of the ureter.

Q. What are the different types of ureteric injury?

Ans. Different types of ureteric injury are:

- (i) Kinking or angulation
- (ii) Ischemic injury due to damage of vascular supply
- (iii) Ligature incorporation
- (iv) Crushing by clamps
- (v) Transection
- (vi) Segmental resection
- (vii) Thermal injury — by diathermy or laser
- (viii) Injury by staplers (laparoscopic surgery).

Q. What are the gynecological pathologies where ureteric injuries are more likely during operation?

- Ans.** (i) Cervical fibroid
(ii) Broad ligament tumor
(iii) Pelvic endometriosis
(iv) Gynecologic malignancy (cervix and ovary)
(v) Pelvic hematoma
(vi) Tubo-ovarian mass.

Q. What are the different methods of repair for ureteric injury?

- Ans.** Repair could be done by:
- (a) Ureteric mobilization and tension-free anastomosis (end to end) over an uretric stent;
 - (b) Ureteric implantation into the bladder or creating a bladder flap.

CASE – 6 RECTO-VAGINAL FISTULA**Case Summary**

Mrs CL, 28-year-old housewife presented with the complaints of leakage of flatus and feces into the vagina. She had a difficult forceps delivery during her last child birth 6 months ago. On rectovaginal examination the findings are as shown in the Fig. 11.15.

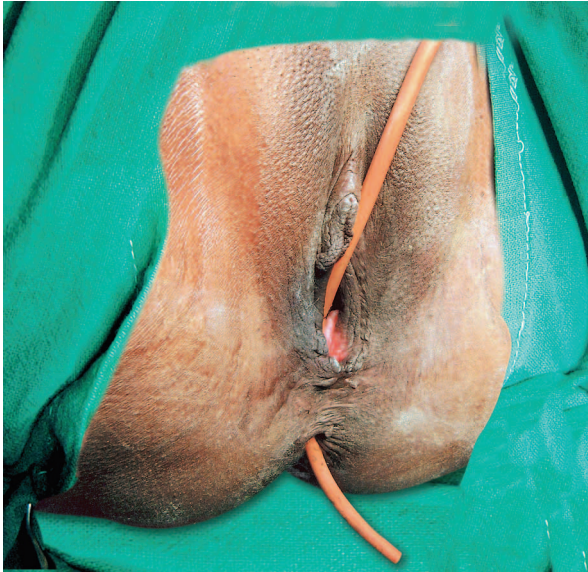


Fig. 11.15: Recto-vaginal fistula following traumatic forceps delivery. The catheter is seen to come out through the anus when introduced through the fistula site in the vagina

Q. What is most likely the diagnosis?

Ans. Rectovaginal fistula (RVF).

Q. What are the common causes of recto-vaginal fistula (RVF)?

Ans. A. Acquired and B. Congenital

A. Acquired

(a) Obstetrical

- (i) Unrepaired complete perineal tear (CPT)
- (ii) Obstructed labor—where the sacrum is flat
- (iii) Traumatic—during destructive operation.

(b) Gynecological

- (i) Imperfect repair of Complete Perineal Tear.
- (ii) Trauma — Perineorrhaphy, posterior colpotomy, vaginal reconstruction surgery.

(iii) Malignancy—Vagina and cervix.

(iv) Radiation.

B. Congenital — Anal canal may open into the vagina.

Q. How do you repair a rectovaginal fistula ?

Ans. A. Transvaginal method of repair is commonly done. Scar margin is excised. Vaginal wall is separated from the underlying rectal wall. Repair is done without any tension.

B. High-up fistula: Initial colostomy is done. Local repair of fistula is done after 3 weeks, then after another 3 weeks, closure of colostomy is done.

CASE – 7 OLD COMPLETE PERINEAL TEAR**Case Summary**

Mrs LT 27-year-old housewife, presented herself in the outpatient clinic for her inability to hold flatus and feces. She noticed this following her last childbirth that was nearly four months back at her home. Perineal examination revealed — see Fig. 11.16.



Fig. 11.16: Old complete perineal tear. Perineum is absent. The torn sphincter ends are seen

Q. What is most likely the diagnosis ?

Ans. Old complete perineal tear (both external and internal).

Q. What do you mean by this ?

Ans. When there is tear of the perineal body involving the anal sphincter complex (both external and internal) with involvement of the anorectal mucosa. It is called old as because the duration is more than 3 months.

Q. What are the different degrees of perineal tear?

- Ans.** (a) **First degree:** Injury of the vaginal epithelium, perineal skin and fourchette. Perineal body remains intact.
- (b) **Second degree:** Injury of the posterior vaginal wall and tear of the perineal body excluding the anal sphincter.
- (c) **Third degree:** Injury of the posterior vaginal wall, tear of the perineal body including the anal sphincter complex (both the external and internal anal sphincters) without involvement of the anal canal or rectum.
- (d) **Fourth degree:** Injury to the perineum involving the perineal body, anal sphincter complex (EAS and IAS) and anal and rectal mucosa.

Q. What are the important risk factors for complete perineal tear?

- Ans.** Risk factors are: ■ Primigravida ■ Big baby (>3 kg), ■ Mid line episiotomy ■ Forceps delivery ■ Scar in the perineum.

Q. What structures are torn in a case of Complete Perineal Tear (CPT) ?

- Ans.** Posterior vaginal wall, perineal skin, perineal body with the sphincters (both external and internal anal) and anorectal mucous membrane (varying degree).

Q. What are the preoperative preparations ?

- Ans.** She is admitted 3 days prior to surgery. Low residue diet (bread, milk) is given for 2 days is given. Intestinal antiseptics (metronidazole and neomycin) are given for 2 days. Lower bowel is cleared by giving enema for 2 days before the surgery.

Q. What are the principal steps of the operation ?

- Ans.** Repair of CPT is done by flap method.
- ♦ Rectal wall is mobilized from the vaginal wall.
 - ♦ Torn ends of the sphincter ani externus are mobilized.
 - ♦ Rectal wall is repaired in two layers using interrupted sutures with 'O' Vicryl.
 - ♦ Torn ends of the sphincter are approximated by interrupted sutures. 'O' Vicryl or PDS (polydioxanone) is used.
 - ♦ Repair of the vaginal wall and skin.

Q. What special postoperative care you will take for the patient ?

- Ans.** ♦ Nonresidual diet till the 5th postoperative day.
- ♦ Lactulose (stool softner) 10 ml twice daily from the 3rd postoperative day.

Q. What advice you will give the patient on discharge?

- Ans.** ♦ Mild laxative (lactulose) should be continued for few days more to keep stool soft.
- ♦ Contraception to postpone immediate pregnancy.

Q. What special precaution would be necessary during her next childbirth?

- Ans.** ♦ Antenatal check up during pregnancy and mandatory hospital delivery
- ♦ Liberal mediolateral episiotomy is a must.

Q. What are the preventive measures that can avoid a CPT ?

- Ans.** Proper conduction of the second stage of labor: To maintain flexion of the fetal head, to deliver the head in between contractions, perineal guard (Ritzen's maneuver), episiotomy in time and care during delivery of the shoulders.

Q. What are the complications following repair of a complete perineal tear?

- Ans.** (a) Complete dehiscence of the wound
- (b) Incomplete dehiscence — leading to rectovaginal fistula
- (c) Too much tightening of the sphincter causing difficulty in defecation
- (d) Dyspareunia.

CASE – 8 PELVIC INFECTIONS**Case Summary**

A 32-year-old parous woman presented with the complaints of (i) lower abdominal pain and (ii) abnormal vaginal discharge. On examination there was raised oral temperature $> 101^{\circ}\text{F}$; pelvic examination revealed cervical motion tenderness, uterine and adnexal tenderness. Transvaginal sonography and diagnostic laparoscopy revealed bilateral tubo-ovarian mass, hydrosalpinx with hyperemia.

Q. What is the most likely diagnosis?

Ans. Pelvic inflammatory disease (PID). This woman fulfills the diagnostic criteria of PID according to Center for Disease Control and Prevention (CDC and P).

Q. What are the common organisms involved in pelvic infection?

Ans. 1. Pyogenic (50%)

- | | | |
|-----------------|---|-------------|
| ■ Gram positive | } | Aerobic and |
| ■ Gram negative | | Anaerobic |

2. Sexually transmitted diseases (STDs)

3. Parasitic

4. Fungal

5. Viral

6. Tubercular

Q. What are the modes of spread of gonococcus infection?

- Ans.** ♦ Through continuity and contiguity
- ♦ Lymphatics and pelvic veins
 - ♦ Bloodstream
 - ♦ From adjacent extragenital organs.

Q. What are the risk factors for PID?

Ans. Women with:

- (a) Multiple sexual partners
 - (b) Previous history of PID.
- are at risk of having PID.

Q. What are the protective factors for PID ?

- Ans.** (i) Use of contraceptive measures:
- (a) Condoms
 - (b) Oral contraceptives
- (ii) Monogamy.

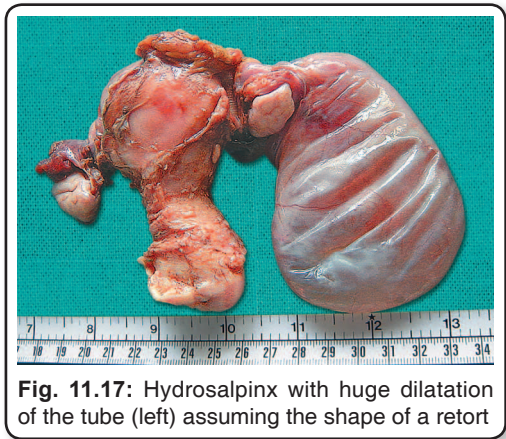


Fig. 11.17: Hydrosalpinx with huge dilatation of the tube (left) assuming the shape of a retort

Q. What is Fitz-Hugh Curtis syndrome?

Ans. It is the sequelae of acute pelvic inflammatory disease. There is pain, discomfort and tenderness in the right hypochondrium due to perihepatitis. Presence of thin '**violin string**' adhesions around the liver and in the pelvis is observed following laparoscopy. The liver is involved due to transperitoneal or vascular dissemination of infection. The organisms commonly involved are chlamydia or gonococcus.

Q. What are the clinical features of acute PID?

Ans. (a) Fever $\geq 38^{\circ}\text{C}$
 (b) Lower abdominal tenderness (bilateral)
 (c) Vaginal discharge
 (d) Deep dyspareunia.

Q. What are the complications of pelvic inflammatory disease?

Ans. Immediate: (a) Pelvic peritonitis (b) Septicemia – producing arthritis or myocarditis.

Late: (a) Infertility, (b) chronic pelvic pain and (c) dyspareunia.

Q. What are the indications of inpatient antibiotic therapy for a woman with PID?

Ans. (a) Persistence of symptoms in spite of conservative management
 (b) Recurrence of acute attacks
 (c) Increase in size of the pelvic mass despite treatment.

Q. What are the important causes of infertility in a woman with chronic PID?

Ans. ♦ Loss of cilia (tubal damage)
 ♦ Loss of tubal peristalsis due to tubal thickening
 ♦ Cornual block
 ♦ Distortion of the tube due to peritubal adhesions
 ♦ Dyspareunia
 ♦ Chronic pelvic pain.

Q. What are the indications of surgery in a woman with chronic PID ?

Ans. a) Recurrence of acute attacks, b) increasing size of pelvic mass and c) infertility for adhesiolysis or restorative surgery.

Q. What is the syndromic management of STIs and RTIs (WHO, UNAIDS – 1991)?

Ans. Syndromic managements are based on epidemiological studies all over the world. Syndromic diagnosis and laboratory diagnosis have been found similar in terms of accuracy. Syndromic management has got many advantages.

- (i) It avoids delay in treatment where laboratory facilities are limited
- (ii) It avoids loss of follow up where referral system is not well-structured
- (iii) Transmission of infection is prevented
- (iv) It is simple, rapid and inexpensive management of STIs and RTIs.

CASE – 9 GENITAL TUBERCULOSIS

Case Summary: A 27-year-old woman presented with the complaints of: (a) chronic pelvic pain (b) menstrual abnormality (oligomenorrhea and amenorrhea) (c) chronic ill health and (d) inability to conceive. She gave the history of pulmonary tuberculosis for which she received complete treatment.

Q. Which genital organ is most commonly affected with tuberculosis?

Ans. Fallopian tubes (100%).

Q. What is the specific pathological change in the fallopian tube ?

Ans. Spread of infection: Hematogenous —

- ♦ Interstitial salpingitis → destruction of muscles → thickened calcified wall.
- ♦ Endosalpingitis → Fimbriae are everted, abdominal ostium usually remains patent → “**Tobacco pouch**” appearance of the tube.
- ♦ **Salpingitis isthmica nodosa** — It is the nodular thickening of the tubes due to proliferation of tubal epithelium within the hypertrophied muscle layer. This is seen at the region of the isthmus. On HSG it appears as a diverticulum. It may also be observed in pelvic endometriosis.

Q. In genital tuberculosis, what is the pathological change in the uterus ?

Ans. Cornual ends are commonly affected (blocked). Endometrial ulceration → adhesion formation → synechiae (Asherman’s syndrome).

Q. What are the symptoms of genital tuberculosis ?

Ans. (i) **Infertility:** Due to tubal block, Asherman’s syndrome (uterine synechiae) or ovarian dysfunction.

(ii) **Menstrual abnormality**

- Menorrhagia or irregular bleeding
- Amenorrhea or oligomenorrhea

(iii) **Others:** Chronic pelvic pain and vaginal discharge.

Q. What are the contraindications of surgery in a case with genital tuberculosis ?

Ans. (i) Presence of active tuberculosis and (ii) when patient is responding to antitubercular therapy.

Q. What is the regimen for antituberculous chemotherapy ?

Ans. RNTCP recommends: Category I (all new cases irrespective of smear positivity): 2H3 R3 Z3E3 + 4H3 R3 and Category II: (smear positive cases with relapse, failure, default or others): 2H3 R3 Z3 E3 S3 + 1H3 R3Z3E3 + 5H3 R3E3.

CASE – 10 ABNORMAL UTERINE BLEEDING (AUB)**Case Summary**

A 42-year-old parous woman presents with the problem of heavy and irregular menses for the last 6 months. She also experiences some amount of progressively increasing dysmenorrhea with it.

Q. What could be the possible type and reasons of this abnormality?

Ans. Menstrual abnormality could be in the form of menorrhagia, dysfunctional uterine bleeding (DUB), metrorrhagia, polymenorrhea and dysmenorrhea. To know further about the type of menstrual abnormality and the cause, we need to know details of her menstrual history. This includes history of menarche, cycle regularity, length of the cycle, duration of period and the amount of bleeding. She needs a thorough clinical examination also.

Q. What are the common causes of menorrhagia?

Ans.

- ♦ Dysfunctional uterine bleeding
- ♦ Fibroid uterus
- ♦ Adenomyosis (Fig. 11.18)



Fig. 11.18: Adenomyosis. The uterus is cut open to show thickened posterior wall. Dark hemorrhagic spots and cystic spaces are seen within the myometrium and there is no capsule

- ♦ Pelvic endometriosis
- ♦ Chronic PID (tubo-ovarian mass)
- ♦ IUCD
- ♦ Hypothyroidism

Q. What are the important causes of contact bleeding ?

- Ans.**
- ♦ Carcinoma cervix
 - ♦ Polyp of the cervix
 - ♦ Vascular ectopy (erosion) of the cervix (pregnancy and pill use)
 - ♦ Infections (chlamydial and tubercular)
 - ♦ Cervical endometriosis (rare).

Q. What are the important causes of oligomenorrhea?

- Ans.**
- (a) Obesity
 - (b) Stress
 - (c) Women with PCOS.

Q. How do you define dysfunctional uterine bleeding (DUB) ?

- Ans.** It is a state of abnormal uterine bleeding without any clinically detectable organic pelvic pathology (e.g. tumor, inflammation or pregnancy).

Q. What are the different types of uterine bleeding observed in DUB ?

- Ans.** (a) **Anovular bleeding**

- (i) Menorrhagia

(Cystic glandular hyperplasia/metropathia haemorrhagica)

Slow rise in FSH → gradually increasing level of estrogen for a period of 6–8 weeks → with concomitant phase of amenorrhea 6–8 weeks → No ovulation → endometrial thickness is increased as it is unopposed by progesterone. Fall in estrogen level → endometrial shedding → heavy and prolonged bleeding.

Uterus → Myohyperplasia with symmetrical enlargement of about 8–10 weeks size.

Endometrium— Endometrial hyperplasia and cystic glandular hypertrophy.

(b) Ovular bleeding

- (i) Polymenorrhea/polymenorrhagia: Endometrium — Secretory changes.
- (ii) Oligomenorrhea: Endometrium — Secretory changes.
- (iii) Menorrhagia (rare)
 - Irregular shedding of endometrium.
 - Irregular ripening of the endometrium.

Q. What special investigations are commonly done for the diagnosis of a case of DUB?

- Ans.** Investigations are designed to exclude any organic, systemic or pelvic pathology.

- ♦ Blood values (including platelet count, peripheral blood film and coagulation profile).
- ♦ Diagnostic uterine curettage (depending on age).
- ♦ Pelvic ultrasonography (transvaginal).
- ♦ Hysteroscopy.
- ♦ Laparoscopy.
- ♦ Hysterography.

Q. What is the medical management of DUB ?

Ans. As majority of women respond well to conservative management.

Medications commonly used are:

- (a) Hormones:
 - (i) Medroxy progesterone acetate
 - (ii) Nonethisterone acetate.
- (b) Prostaglandin synthetase inhibitors
- (c) Antifibrinolytic agents: Tranexamic acid.

Q. What are the different types of surgery that can be done for the management of DUB ?

Ans. (i) Uterine curettage
 (ii) Endometrial ablation or resection
 (iii) Hysterectomy.

Q. Give an outline of management of DUB keeping in mind the different age group of the women ?

Ans. All women, irrespective of the age, need to be investigated to detect the cause of DUB.

Common investigations done are

- (a) Ultrasonography
- (b) Hysteroscopy and biopsy
- (c) Endometrial sampling/D and C
- (d) Laparoscopy.

Management is done according to the pathology and the age of the women.

| Age group | Management |
|---|--|
| (a) Pubertal or adolescent age (less than 20 years) | ♦ Progestogen therapy (commonly) |
| (b) Reproductive age group (20-40 years): | ♦ Family not completed—Medical management ♦ Family completed—Endometrial resection/Hysterectomy |
| (c) Perimenopausal age (>40 yrs) | ♦ Exclude malignancy ♦ Medical management-Progestins ♦ Hysterectomy |
| (d) Post-menopausal | ♦ Exclude malignancy ♦ May need hysterectomy. |

CASE – 11 **HYDATIDIFORM MOLE****Case Summary**

This specimen has been removed from a 28-year-old nulliparous woman following suction evacuation (see Fig. 11.19).

Q. What is the possible diagnosis ?

Ans. The specimen shows multiple grape-like vesicles of different sizes. This is the specimen of hydatidiform mole.

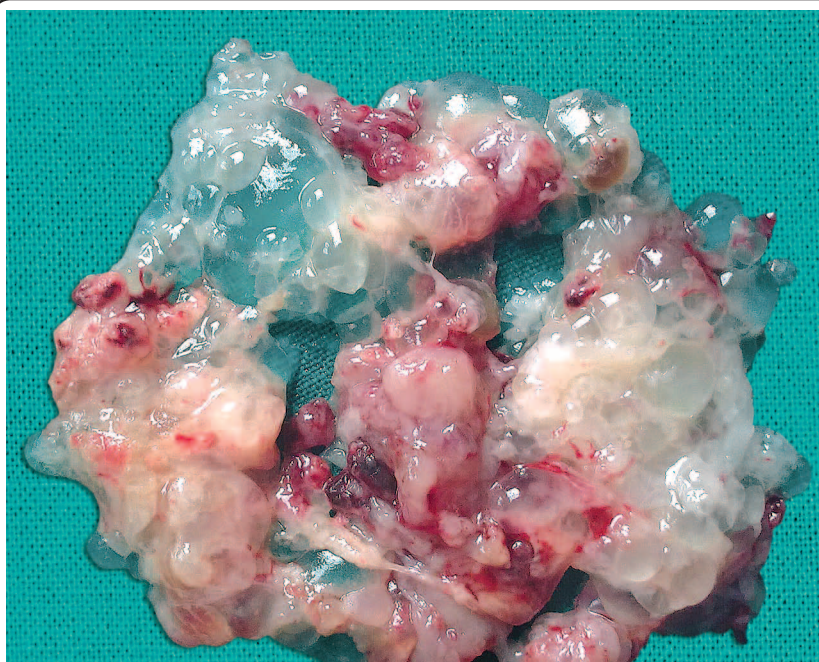


Fig. 11.19: Hydatidiform mole. Grape-like vesicles are seen

Q. What are the characteristic microscopic changes in the molar tissue?

Ans. (i) Marked proliferation of the syncytial and cytotrophoblastic epithelial cells
(ii) Thinning of the stromal tissue (hydropic degeneration)
(iii) Absence of blood vessels in the villi
(iv) The villus pattern is maintained.

Q. What are the characteristic ovarian changes in molar pregnancy?

Ans. Ovaries are enlarged due to formation of the theca lutein cysts. Ovarian changes may be unilateral or bilateral. It is present in about 25–50% of the cases.

Q. What are the clinical features of molar pregnancy?

- Ans.**
- ♦ Vaginal bleeding
 - ♦ Lower abdominal pain
 - ♦ Expulsion of grape-like vesicles
 - ♦ Constitutional symptoms: Vomiting, breathlessness and features of thyrotoxicosis.

On examination**General examination:**

- ♦ Pallor
- ♦ Pre-eclampsia (early onset).

On abdominal examination:

- ♦ Uterine size — Usually more than the period of amenorrhea.
- ♦ Uterus feels — Doughy.
- ♦ Fetal parts : Not felt,
- ♦ FHS : Not heard.

On vaginal examination:

- ♦ No internal ballottment
- ♦ Ovarian cyst (theca lutein cyst) may be palpable.

Q. How to confirm the diagnosis of hydatidiform mole ?

- Ans.**
- (i) Sonography: 'snow storm' appearance
 - (ii) Serum β -hCG raised ($> 100,000$ IU/ml).

Q. What are the complications of hydatidiform. mole ?

- Ans.**
- (i) Hemorrhage
 - (ii) Shock
 - (iii) Sepsis
 - (iv) Uterine perforation and internal hemorrhage
 - (v) Respiratory distress
 - (vi) Choriocarcinoma (2–10%).

Q. Who are the high-risk women to develop choriocarcinoma ?

- Ans.**
- (i) Woman's age is ≥ 39 years
 - (ii) Parity is ≥ 3
 - (iii) Serum hCG is $\geq 100,000$ IU/ml
 - (iv) Uterine size is > 20 weeks
 - (v) Previous history of molar pregnancy
 - (vi) Theca lutein cysts > 6 cm.

Q. What are the indications of prophylactic chemotherapy ?

Ans. This is an area of controversy. Prophylactic chemotherapy is considered for women at risk of developing gestational trophoblastic neoplasia (GTN).

The cases are:

- (a) Age ≥ 35 years
- (b) Initial level of serum hCG is $\geq 100,000$ IU/ml
- (c) hCG fails to become normal by 7–9 weeks time or there is re-elevation
- (d) Previous history of molar pregnancy
- (e) Woman who is unreliable for follow-up
- (f) Centers where follow-up facilities are not available.

Q. What are the unfavorable manifestations during follow up of a woman with molar pregnancy?

- Ans.**
- (i) Persistent ill health
 - (ii) Irregular vaginal bleeding
 - (iii) Subinvolution of the uterus
 - (iv) hCG values remain elevated
 - (v) Chest radiograph – evidence of metastasis
 - (vi) Appearance of cough and hemoptysis.

Q. How to differentiate a complete mole from a partial one ?

Ans. Complete mole can be differentiated from a partial mole by the following features.

Complete mole: ■ Fetus is absent ■ Hydropic changes of the villi are diffuse ■ Uterine size is enlarged. ■ Levels of hCG is ($>50,000$) high. ■ Risk of persistent GTN is high (20%).

Q. What is persistent gestational trophoblastic neoplasia (GTN) and how is it treated?

Ans. Persistent GTN is a condition where there is persistence of trophoblastic activity following evacuation of molar pregnancy. This is clinically diagnosed when the patient presents with (a) irregular vaginal bleeding, (b) subinvolution of the uterus, (c) persistence of theca lutein cysts and (d) levels of hCG either plateaus or re-elevates after an initial fall.

Q. How is the workup done for the treatment of GTN?

Ans: Patients are evaluated and then scored according to WHO prognostic scoring system. Depending upon the score, woman is treated either with single agent the or with multiple agents chemotherapy. Surgery is reserved for selected cases.

CASE – 12 UTERINE POLYP

This specimen with the tumor (see Fig. 11.20) had been removed from a 45-year-old lady.

Q. What is the diagnosis ?

Ans. Uterine polyp: The uterus is cut open to show a huge pedunculated polyp arising from the fundus. It is protruding out of the external os of the cervix. Cervix is seen to be thinned out.

Q. What was her clinical presentation ?

Ans. Vaginal discharge, irregular bleeding, intermenstrual bleeding, pain in lower abdomen.

Q. What could be the complications of this tumor if not treated ?

Ans. Infection, ulceration, bleeding, sarcomatous change (rarely).

Q. What treatment has been done on her ?

Ans. Total abdominal hysterectomy with bilateral salpingo-oophorectomy.

Q. What could be the alternative method of treatment in such a case ?

Ans. Polypectomy (removal of the polyp only).

Q. How could you differentiate a fibroid polyp from inversion of the uterus?

Ans. Sound test: A uterine sound can be passed all around the pedicle and the dilating cervical canal whereas in a case with chronic inversion, the sound cannot be passed.

Q. How is a polyp treated?

- Ans. ■** Endometrial polyp can be removed by hysteroscopy and resection under direct vision.
- Big fibroid polyp lying in the vagina is removed in piecemeal. The pedicle is then transfixed.

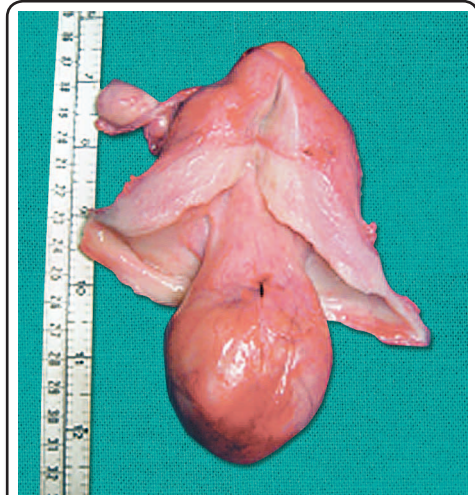


Fig. 11.20: Huge fibroid polyp with a thick pedicle arising from the fundus. Cervix is seen thin and effaced

CASE – 13 INFERTILITY**Case Summary**

Mrs VP 26-year-old, married for 3 years is seen in the gynecology clinic with the problem of her inability to conceive. She is living with her husband with regular conjugal relationship.

Q. What is the diagnosis ?

Ans. Primary infertility.

Q. What are the common causes of male infertility ?

Ans. (a) **Pretesticular** : (i) Thyroid dysfunction (ii) hyperprolactinemia, (iii) psychosexual and (iv) drugs (antipsychotics).

(b) **Testicular**: Cryptorchidism, mumps orchitis, genetic (46 XXY) and testicular failure.

(c) **Posttesticular** : Obstruction of vas deferens (infection and trauma).

Q. How much proportion of infertility each partner is responsible for?

Ans. **Male** = 30–40%

Female = 40–50%

Both = 10%

Unexplained = 10%

Q. What is understood by primary and secondary infertility ?

Ans. **Primary infertility** is a condition in which the woman had never been pregnant despite more than 1 year of unprotected intercourse.

A woman who had been pregnant before (live born, ectopic pregnancy or abortion), yet is currently unable to conceive after 1 year of unprotected intercourse is called **secondary infertility**.

Q. What are the important causes of female infertility ?

Ans. (a) Ovarian factors (15–20%)

(b) Tubal and peritoneal factors (25–35%)

(c) Endometriosis (1–10%)

(d) Uterine and cervical factors.

Ovarian factors for infertility are:

(i) Anovulation/oligo-ovulation

(ii) Luteal phase defect (LPD)

(iii) Luteinized unruptured follicle (LUF) syndrome.

Q. What are the possible causes of anovulation ?

Ans. Obesity, PCOS, endocrine dysfunction, like hypothyroidism and raised prolactin level.

Q. What are the important tubal factors ?

Ans. Tubal block may be due to infection and/or adhesions.

Q. What are the normal values of semen analysis ?

Ans. Normal semen Volume: ≥ 2 ml; Normal sperm concentration is 20 million/ml (15 million/ml). Sperm motility: $\geq 50\%$ having progressive forward motility; sperm morphology: $\geq 15\%$ normal form; Viability: $\geq 75\%$ living. (WHO- 2010).

Q. How do you detect ovulation ?

- Ans.** (i) **Women having regular normal menstruation** are usually ovulating.
- (ii) **Biphasic pattern of BBT** suggests ovulation.
- (iii) **Cervical mucus study:** Disappearance of fern pattern after 22nd day of the cycle, which was present before, indicates ovulation.
- (iv) **Serum progesterone:** Increased value from D8 (≤ 1 ng/ml) to D21 (> 6 ng/ml) suggests ovulation.
- (v) **Serum LH:** Detection of mid cycle LH surge indicates impending ovulation by next 10–12 hours.
- (vi) **Serum estradiol** reaches its peak level 24 hours prior to LH surge.
- (vii) **Endometrial biopsy (sampling):** Evidence of secretory endometrium in the second half of the cycle suggests ovulation.
- (viii) **Sonography:** Cervical sonography (TVS) to detect growth and development of follicle and subsequently collapsed follicle and fluid in the pouch of Douglas suggests ovulation.

Q. How do you interpret BBT chart ?

Ans. Biphasic pattern of BBT, suggests ovulation, as progesterone is thermogenic.

Q. Which day of the menstrual cycle endometrial biopsy is done to detect ovulation?

Ans. Biopsy is done on 21st – 23rd days of the cycle.

Q. How can serum progesterone estimation be helpful ?

Ans. See above.

Q. How do you assess the anatomical patency of the tubes ?

- Ans.** (a) **Insufflation test:** It is done 2 days after stoppage of menstrual bleeding. Air or CO_2 is pushed transcervically into the peritoneal cavity which is heard as a hissing sound on auscultation at either of the iliac fossa.
- (b) **Hysterosalpingography:** Principle of this method is the same as that of Dilatation and Insufflation. A radiopaque dye is used instead of air or

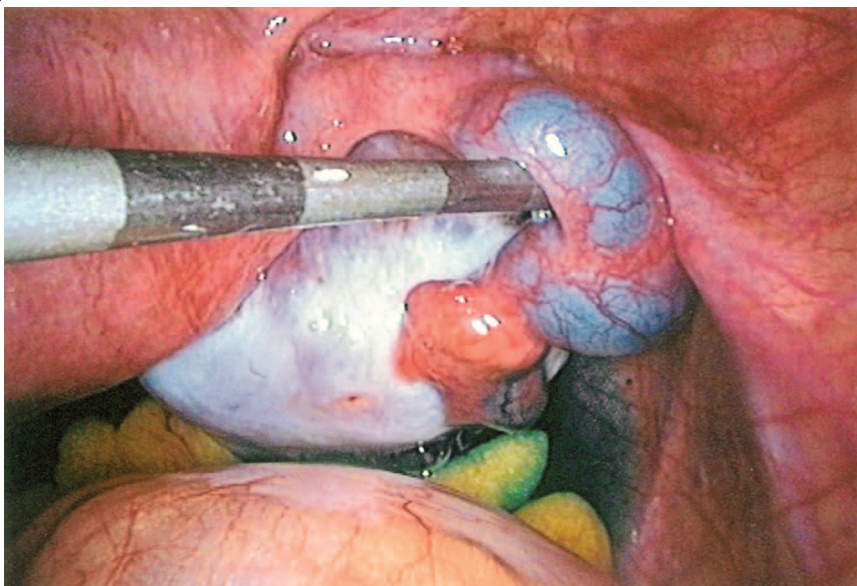


Fig. 11.21: Laparoscopic chromopertubation. Dye is seen to coming out from the abdominal ostium of the tube

CO₂. It is more precise as it can detect the side as well as the site of tubal block. It is done between D7 and D10 of the cycle.

- (c) **Laparoscopy and chromopertubation:** It is the gold standard method. A dye (methylene blue) is pushed transcervically. When the dye is seen to be spilled in the peritoneal cavity through the abdominal ostium, tubes are noted as patent. Laparoscopic method has other advantages also. Tubal block (it's side, site) and other pelvic pathology, (PCOS or pelvic endometriosis) can be detected simultaneously.

Other methods are:

- (i) Falloposcopy
- (ii) Salpingoscopy

Q. How do you treat a woman with anovulatory infertility?

Ans: Ovulation induction is to be done. Commonly used drug is clomiphene citrate. It is given in a dose of 50 mg twice daily for 5 days (D3 – D7). It enhances gonadotrophic secretion due to its antiestrogenic property.

Q. What is the place of adjuvant therapy?

Ans: Some women need adjuvant therapy:

- (a) Women with hyperinsulinemia - Metformin therapy
- (b) Hypothyroidism - Thyroxin replacement
- (c) Hyperprolactinemia - Dopamin agonist

- **Physiology of Menstruation**
- **Polycystic Ovarian Syndrome**
- **Ovulation Induction**
- **Endometriosis**
- **Cervical Intraepithelial Neoplasia (CIN)**
- **Amenorrhea**

Chapter Objectives

To demonstrate the knowledge and understanding of:

- Physiology, endocrinology of menstruation, puberty, reproduction, ovulation, including infertility.
- Pathological conditions related to endocrine abnormalities (PCOS, amenorrhea)
- Principles in the management of benign diseases of the reproductive organs

TOPIC – 1: PHYSIOLOGY OF MENSTRUATION

Q. What is menarche?

Ans. Onset of **first menstruation** in a girl's life is called menarche.

Q. What is the mean age of menarche?

Ans. Menarche may occur any time between 10–16 years of age. The mean age of menarche is 12.7 years.

Q. How do you define normal menstruation?

Ans. **Normal menstruation** is defined as the visible manifestation of cyclic and physiological uterine bleeding due to shedding of the endometrium. It is the ultimate expression of the invisible interplay of different hormones over the endometrium acting mainly through the Hypothalamus-Pituitary-Ovarian axis.

Q. What is a menstrual cycle? What its usual duration and interval?

Ans. Menstrual cycle begins from the first day of a period (mens) to the beginning (D1) of the next one. **Duration** of menstruation (mens) is about 4–5 days. Normal menstruation occurs at an **interval** of 21–35 days with a mean of 28 days.

Q. What is the usual amount of blood loss in a normal menstrual cycle?

Ans. It is estimated to be 20–80 ml with an average of 35 ml.

Q. What are the different layers of endometrium and what is their hormonal responsiveness.

Ans. The **basal layer**: Usually unresponsive to hormonal stimulation and is not shed out during menstruation. The **functional layer** is responsive to hormonal stimulation. It is subdivided into **stratum compactum** and **spongiosum**. Most of this layer is lost during menstruation.

Q. What are germ cells? When and how the germ cells are populated in genital ridge?

Ans. Germ cells are derived from the endoderm of the yolk sac in the region of the hindgut. Germ cells migrate to the genital ridge along the dorsal mesentery of the hindgut. The migration of germ cells occurs at 5 and 6 weeks of embryonic life.

Q. How many germ cells are there in the fetal, neonatal and pubertal ovary?

Ans. The germ cells undergo rapid mitotic division and some enter into the prophase of the first meiotic division. These are called primary oocytes. The total number of oocytes vary at different phases of life are as shown below.

| Period of life | Total number of germ cells |
|---|----------------------------|
| A. 20 week of fetal life | 6–7 million |
| B. Birth | 2 million |
| C. Puberty | 4,00,000 |
| D. Entire reproductive period | About 400 ovulates |
| Majority of germ cells undergo degeneration | |

Q. What is a primordial follicle?

Ans. Primordial follicle consists of an oocyte which is surrounded by a single layer of flattened granulosa cells. Its growth is not dependent upon gonadotropins. This oocyte is arrested in the prophase of the first meiotic division (diplotene phase).

Q. What is a preantral follicle?

Ans. An oocyte surrounded by the zona pellucida with several layers of granulosa cells and a theca layer, is a preantral follicle. Growth of preantral follicle is independent of gonadotropins.

Q. What is an ovarian cycle of a normal menstruation cycle?

Ans. An ovarian cycle consists of:

1. Recruitment of group of follicles
2. Selection of dominant follicle
3. Ovulation
4. Formation of corpus luteum
5. Demise of corpus luteum

Q. How does recruitment of follicles occur?

Ans. Follicular-stimulating hormone (FSH) is the essential hormone for follicular recruitment. Estrogen acts synergistically with FSH to increase the numbers of FSH receptors on the granulosa cells. It also increases the mitotic activity of granulosa cells and increases the number of granulosa cells. FSH begins to increase in the late luteal phase of the previous cycles.

Q. How the dominant follicle is selected?

Ans. As early as D5–D7, one out of several follicles, become dominant and undergoes further maturation. The follicle having highest antral concentration of estrogen and lowest concentration of androgen and whose granulosa cells contain the maximum number of FSH receptors, becomes the dominant follicle. The rest of the follicles undergo atresia.

Q. What hormones are necessary for progressive follicular growth and development?

Ans. FSH initiates follicular recruitment. FSH is responsible for induction of LH receptors in the follicle. LH stimulates the theca cells to produce androgens. These androgens percolate in the granulosa cells. Granulosa cells secrete the enzyme aromatase. The enzyme aromatase in granulosa cells is essential for conversion of androgen to estrogen within the developing follicle.

Q. What are the different cell layers of a mature graafian follicle?

Ans. The cell layers from outside inwards are:

- (a) Theca externa.
- (b) Theca interna.
- (c) Membrana granulosa.
- (d) Granulosa Cell layers.

(e) Discus proliferous—containing, the ovum which is surrounded by radially arranged cells (corona radiata).

(f) Antrum-containing fluid.

Q. How long is ovarian cycle?

Ans. An ovarian cycle takes about 85 days and it spreads over 3 menstrual cycles.

Q. What is the two-cell and two-gonadotropin concept of ovarian steroidogenesis?

Ans. **Two cells** are—theca cells and granulosa cells; **Two gonadotropins** are—FSH and LH.

During the follicular phase, LH stimulates theca cells to produce androgens (androstenedione, dehydroepiandrosterone and testosterone). These androgens diffuse into the granulosa cells where they are aromatized under the influence of FSH to estrogen (estradiol).

Q. What factors are detrimental for follicular growth and maturation?

Ans. (i) The preantral follicles that are not rescued by FSH, they undergo atresia.
(ii) The antral follicles that have the dominant androgenic follicular micro-environment instead of estrogenic microenvironment, undergo atresia.
(iii) Premature increase in the levels of LH, decrease mitogenic activity of granulosa cells. This causes follicular atresia.
(iv) As the levels of estrogen secreted from the dominant follicle increase, FSH inhibited by negative feedback effect. This causes withdrawal of gonadotropin support of poorly developed follicles. Less developed follicles have got less number of FSH receptors and they undergo atresia.
(v) Dominant follicle plays two important roles in this regard : (a) It optimizes own growth by maintaining dominant estrogenic microenvironment, with maximum FSH receptors and (b) suppress the growth of other follicles by creating negative feedback to FSH.

Q. What are the functions of LH Surge?

Ans. (i) Completion of first meiotic division with extrusion of the first polar body which is pushed to the perivitelline space.
(ii) Physiological act ovulation—release of ovum.
(iii) Luteinization of granulosa cells.
(iv) Formation and maintenance of corpus luteum.
(v) Synthesis of progesterone and prostaglandins.

Q. What is the important of predictor of ovulation?

Ans. Ovulation occurs approximate 34–36 hours after the start of LH surge or 10–12 hours after the peak of the LH surge.

Q. What are the important hormonal events that precede ovulation?

Ans. 1. Optimum serum levels of estradiol (E2) ≥ 200 pg/ml and it is to be sustained for 48 hours.

2. Peak and sustained level of E2 exerts a positive feedback action on LH.
3. LH surge generally persists for 24 hours.
4. Ovulation occurs approximately 10–12 hours after the LH surge or 24–36 hours after the peak estradiol level.

Q. What causes extrusion of the oocyte from the follicle (ovulation)?

Ans. It is the passive stretching following necrobiosis of the overlying follicular wall due to the effect of combined LH and FSH. There is enzymatic activation of plasminogen and hyaluronidase. It is more likely that there are degenerative changes in follicular wall with enzymatic destruction of collagen which allows passive expansion and ultimate rupture of the follicle. Though there is increase in antral fluid volume, the follicular fluid hydrostatic pressure is not increased.

Q. What is the corpus luteum (CL)?

Ans. Following ovulation, the ruptured graffian follicle develops into the corpus luteum.

Q. What are the different stages of the growth of CL?

Ans. There are 4 stages of the growth of CL:

- (a) Proliferation
- (b) Vascularization
- (c) Maturation
- (d) Regression.

Q. Which hormones are necessary for the formation and maintenance of CL?

Ans. ♦ Normal luteal function requires adequate follicular development. This needs adequate FSH stimulation of the dominant follicle.

♦ Midcycle LH surge causes ovulation, luteinization of the granulosa cells and optimum secretion of progesterone.

♦ LH secretion must be continued for function of CL, failing which the CL will regress. Therefore life span and steroidogenic capacity of CL are dependent of on continued tonic secretion of LH.

Q. What is the life span of CL in a nonconception cycle?

Ans. CL has a life span of about 12–14 days. $\text{PGF}_{2\alpha}$ liberated from the ovary is luteolytic.

Q. When does the level of progesterone reach the peak in the luteal phase?

Ans. Progesterone level peaks approximately on the D-8 after the LH surge. This causes secretory changes in the endometrium and also suppresses new follicular growth.

Q. When is the implantation likely to occur?

Ans. The implantation window in a normal cycle menstrual cycle is between D_{20} – D_{24} .

Q. What changes are there in a corpus luteum of pregnancy?

Ans. There is marked hyperplasia in all the layers between D_{23} and D_{28} of the cycle. This is due to human chorionic gonadotropin (hCG) secreted by

the trophoblastic cells. Progesterone secretion is continued from the CL of pregnancy.

Q. What is luteal placental shift?

Ans. This shift is the taking over of function of CL by the developing placenta. This turnover of function from the CL of pregnancy to placenta is called **luteal placental shift**. This transition period continues between 7 and 10 weeks.

Q. What is a luteal phase defect?

Ans. Deficient function of CL with diminished secretion of progesterone, is called luteal phase defect. The role of luteal phase defect as an etiology infertility is not clearly understood. Diagnosis and management of luteal phase defects are discussed (Dutta Gyna 6/e, p 229, 247).

Q. What is the endometrial cycle of normal menstruating women?

Ans. It is the sequence of endometrial changes in response to ovarian cycle. Normal endometrium has a **basal zone** (nonresponsive to hormones) and a **functional zone**, responsive to cyclic ovarian hormones.

Q. What are the different phases of endometrium during a menstrual cycle?

Ans. There are the following four phases:

- (a) **Phase of regeneration:** D2–D3, regeneration of blood vessels, glands, stroma and surface epithelium starts even before menstruation ceases.
- (b) **Phase of proliferation:** Growth of endometrial glands are there. Glands become tubular, surface epithelial cells are columnar type. The cell nucleus is placed at the base of the cell. Spindle-shaped stromal cells proliferate with evidences of mitosis. Blood vessels continue to grow unbranched upto the level of surface epithelium. The endometrium becomes 3–4 mm thick, proliferative changes are due to ovarian oestrogens
- (c) **Phase of secretory endometrium:** The endometrial changes are due to progesterone. However progesterone can only act on the endometrium previously primed by estrogen. Presence of subnuclear vacuolation is the earliest evidence of progesterone effect (ovulation). The endometrium becomes 6–8 mm thick.
- (d) **Menstrual phase:** This is described below.

Q. What is the menstrual phase?

Ans. It is essentially the phase of degeneration and shedding off the endometrium. Regression of the corpus luteal function and its demise causes fall in the level of oestrogen and progesterone. This is an inevitable physiological change in a nonconceptual cycle. As a result of the withdrawal of hormonal support, the endometrium is casted off. It normally lasts for 5–6 day.

TOPIC – 2: POLYCYSTIC OVARIAN SYNDROME

Q. What is polycystic ovarian syndrome?

Ans. PCOS is a multifactorial heterogenic condition.

Diagnosis is based upon the presence of any two of the following three features ASRM/ESHRE-2003).

- (A) Oligo-ovulation and/or anovulation.
- (B) Hyperandrogenemia (clinical and/biochemical)
- (C) Polycystic changes of the ovaries: The ovaries are enlarged in volume ($\geq 10\text{cm}^3$), with presence of multiple (≥ 12) follicular cysts around the ovarian cortex.

Q. What are the common presenting features of PCOS?

Ans. Symptoms:

- Infertility (due to anovulation)
- Amenorrhea or oligomenorrhea, dysfunctional uterine bleeding
- Obesity
- Hirsutism
- Acanthosis nigricans (skin changes)
- HAIR-AN syndrome.

Q. What are the biochemical abnormalities associated with PCOS?

Ans.

- Hyperandrogenemia (Increased levels of testosterone and DHEA)
- Hyperinsulinemia
- Insulin resistance (mutations in the insulin receptor gene of tissues)
- High levels of serum estrogen (E1 and E2)
- Hyperprolactinemia
- Hyper secretion of LH
- Low FSH
- Low serum SHBG levels
- Hyperlipidemia
- Abnormal glucose tolerance (increased risk of diabetes mellitus (25–30%))

Q. What are the important management options of a woman with PCOS?

Ans. A) Weight reduction, in obese women, is the first line management. **Body mass index (BMI) < 25 improves obesity, menstrual abnormality, infertility, insulin resistance and hyperandrogenemia.**

B) When fertility is not desired—

a) Combined oral contraceptive pills is the other option. It reduces excess androgen levels. At the same time it makes the menstrual cycle regular.

b) Hirsutism: Antiandrogens (cyproterone acetate and flutamide), may be used.

Q. What is your management approach of a married woman with PCOS that is interested to have a baby.

Women with PCOS often suffer from anovulation. This woman should be investigated to identify the husband factor, tubal factor and ovulatory factors of conception. Once she is found to suffer from anovulation, induction of ovulation should be considered for her.

Q. What are the common drugs used for induction of ovulation ?

Ans. Clomiphene citrate, and gonadotropins (FSH and LH)

Rest to see: Ovulation induction: Topic 3.

Q. What are the long-term sequelae of PCOS?

Ans. Possible adverse effects are the development of:

- Type II diabetes mellitus (DM)
- Endometrial carcinoma
- Hypertension, cardiovascular disease and coronary artery disease (heart attack)
- Dyslipidemia (abnormal lipid metabolism: ↑triglycerides and LDL)
- Sleep apnea.

TOPIC – 3: OVULATION INDUCTION

Q. What are the common causes of anovulation?

Ans. Common causes are:

- (a) Polycystic ovarian syndrome
- (b) Hypo/hyperthyroidism
- (c) Hyperprolactinemia
- (d) Hypothalamic causes (stress and weight loss)
- (e) Premature ovarian failure
- (f) Dysgenetic gonads (45 XO, 46 XX).

Q. What is ovulation induction?

Ans. It is the method to stimulate the ovaries to produce eggs using medications. Commonly used medications are of three types: (a) Clomiphene citrate, (b) gonadotropins (FSH/LH) and (c) GnRH.

Q. When is clomiphene citrate indicated and how is it prescribed?

Ans. It is used for induction of ovulation primarily in cases with PCOS. It is prescribed on days 3–7 of the menstrual cycle. The starting dose is usually 50 mg twice a day.

Q. How does clomiphene citrate (CC) work?

Ans. Clomiphene citrate works as an anti estrogen as well as weak estrogen at the level of hypothalamus. It binds with the estrogen receptors and blocks the receptors for a long time. This causes increased GnRH pulse amplitude resulting in increased gonadotropin secretion from the pituitary. This ultimately results in increased secretion of FSH by the anterior pituitary. High levels of FSH cause increased follicular growth and maturation.

Q. What is the overall result of clomiphene therapy ?

Ans. Successful induction rate is about 80%. However cumulative pregnancy rate is about 70%.

Q. What should be the management option when the women fails to ovulate with CC?

Ans. In such a case, the dose of CC may be increased upto a maximum of 200 mg/day for 5 days. If the woman does not respond even with this, she may be considered for gonadotropin therapy provided she has got good ovarian reserve.

Q. What is the place of metformin as an adjuvant therapy ?

Ans. Women with PCOS with obesity ($BMI \geq 25$) are insulin resistant. Treatment with metformin are found to reduce hype androgenemia and hyperinsulinemia. Combined treatment with metformin and clomiphene increases ovulation rate.

Q. What is Metformin?

Ans. Metformin is

- An oral biguanide and an antihyperglycemic drug
- Used for treatment of non-insulin dependent diabetes
- Category B drug for pregnant women.

Q. How metformin works?

Ans. The functions of metformin are:

A. Metformin lowers blood glucose by—

- Inhibiting hepatic glucose production
- Decreasing intestinal glucose uptake
- Inhibiting lipolysis, decreases FFA levels
- Decreasing hepatic neoglucogenesis
- Enhancing peripheral glucose uptake
- Enhancing insulin sensitivity at the post receptor level
- Stimulating insulin mediated glucose disposal

B. Other functions of metformin are:

- Increases insulin sensitivity
- Decreases weight and BMI
- Decreases LDL cholesterol
- Decreases blood pressure
- Decreases CRP levels.

Q. What are the risks of ovulation induction?

Ans. (a) Multiple pregnancies
(b) Ovarian hyperstimulation.

Q. What is ovarian hyperstimulation syndrome (OHSS)?

Ans. OHSS is the development of multiple follicles with enlargement of the ovaries following hCG stimulation. It is observed in 1–2% of cases following induction of ovulation with gonadotropins.

Q. Can OHSS occur with CC therapy?

Ans. It may occur but is very rare.

Q. How does a woman with OHSS present?

Ans. Presenting features are: nausea, vomiting, abdominal enlargement due to ascites. There is ovarian enlargement, ascites, severe fluid and electrolyte imbalances, hemoconcentration, oliguria and rarely thromboembolism. Patient needs hospitalization when the features are moderate to severe.

TOPIC – 4: ENDOMETRIOSIS

Q. What is endometriosis?

Ans. It is the functioning endometrium situated in sites other than uterine mucosa.

Q. What is adenomyosis?

Ans. When the ectopic endometrial tissues are found to grow within the layers of myometrium it is called endometriosis interna or adenomyosis.

Q. What are the common sites of endometriosis?

Ans. Common sites are:

- Ovaries ▪ Uterosacral ligaments ▪ Pelvic peritoneum
- Pouch of Douglas ▪ Rectovaginal septum ▪ Sigmoid colon
- Umbilicus (bleeding)



Fig. 12.1: Endometriosis in a umbilicus

This is relatively an uncommon site for endometriosis

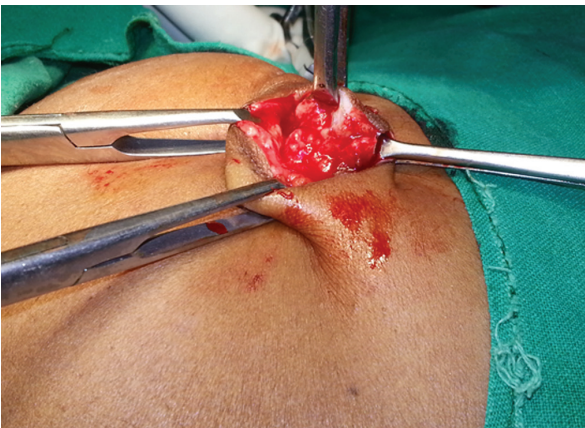


Fig. 12.2: Dissection for excision of endometriotic nodule in the umbilicus

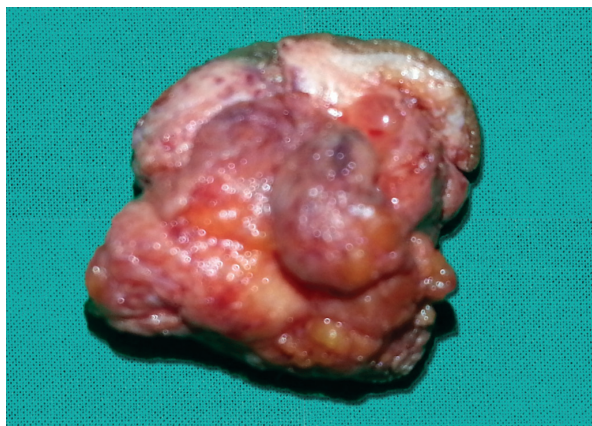


Fig. 12.3: Endometriotic Nodule dissected out. Histopathology confirmed endometriosis.

Q. How does pelvic endometriosis appear on clinical examination?

Ans. They appear as small black dots on uterosacral ligaments and pouch of Douglas. These also appear as '**Powder Burns**'. Other appearances are: Red flame shaped areas and yellow-brown patches.

Q. How does a woman with pelvic endometriosis present?

Ans. Common presenting features are:

- i. Woman's age between 25–45 years
- ii. Parity : Mostly nulliparous
- iii. Dysmenorrhea (70%); it is gradually increasing
- iv. Menstrual abnormality: Menorrhagia
- v. Infertility (40–60%)
- vi. Dyspareunia
- vii. Chronic pelvic pain
- viii. Other rare symptoms may be: Backache, hematuria, and painful defecation

Abdominal and pelvic examination

- (a) Chocolate cysts may be felt on abdominal examination.
- (b) Pelvic examination reveals: nodules in the pouch of Douglas and tenderness.

However some women many remain asymptomatic.

Q. How can pelvic endometriosis be diagnosed?

- Ans.**
- A. Clinical: As discussed above
 - B. Ultrasonography: Ovarian endometrioma
 - C. Laparoscopy is the gold standard. It can confirm the diagnosis.

Q. What are the different treatment options for pelvic endometriosis?

- Ans.**
- A. Expectant management (observation only)
 - B. Medical therapy: (i) Hormones and (ii) others
 - C. Surgery : (i) Conservative and (ii) definitive
 - D. Combined therapy.

Medical Therapy: It is done mainly to suppress the growth of endometriotic implants. The endometriotic tissues gradually become atrophic.

Hormones commonly used are:

- (a) Combined estrogen and progesterone (oral pill) for 6–9 months
- (b) Progestogens: Medroxyprogesterone acetate 10 mg tds for 6 months; it can also be given intramuscular (IM), 150 mg, 3 monthly.
- (c) Levonorgestrel releasing IUCD has been found helpful.
- (d) Danazol.
- (e) GnRh analogues.

Conservative surgical management

A. Conservative surgery

- (a) Laparoscopic
- (b) Laparotomy
- (a) Surgeries are:
 - i) Electrofulguration of endometriotic lesions
 - ii) Laser vaporization
 - iii) Ovarian cystectomy.

B. Definitive surgery

Hysterectomy and bilateral salpingo-oophorectomy in women who are elderly and have completed their family.

Q. How does a women with adenomyosis present?

Ans. A. Clinical features

- i) Women are usually parous with age usually ≥ 40 years
- ii) Menorrhagia (70%)
- iii) Dysmenorrhea (30%)
- iv) Women in their reproductive age group often suffer from infertility.

B. On examination

- i) Mass may be felt in the hypogastrium
- ii) On pelvic examination—uterus is found uniformly enlarged and often it is often tender.
- iii) Ultrasonography reveals hypoechoic myometrium with multiple small cysts in the myometrium.
- iv) Magnetic resonance imaging (MRI) is more specific to the diagnosis—low signal intensity and junctional zone (JZ) ≤ 8 mm excludes the disease. JZ thickening ≥ 12 mm is suggestive of adenomyosis.

Q. What are the management options available for adenomyosis of the uterus?

Ans. (a) Medical therapy (hormones and others) usually not effective

- (b) LNG-IUS found to be helpful
- (c) Surgical treatment is commonly done either (i) adenomyomectomy, or (ii) hysterectomy (in parous and elderly women).

TOPIC – 5: CERVICAL INTRAEPITHELIAL NEOPLASIA (CIN)

Q. What is CIN?

Ans. **Cervical intraepithelial neoplasia (CIN):** It is a condition where cervical squamous epithelium is replaced by cells with varying degree of atypia.

Q. What is the site of origin for CIN?

Ans. CIN arises in the area of metaplasia which is located in the transformation zone of the squamocolumnar junction (SCJ).

Q. What is the significance of detection of CIN?

Ans. Most CIN I and some CIN2 regress spontaneously. But CIN may progress to invasive cervical carcinoma over a period of 10–15 years. CIN is caused mainly by human papilloma virus infection (HPV). Over 99.7% of patients with CIN and invasive cancer are found to be positive with HPV-DNA.

Q. What important types of HPV are of concern?

Ans. Types of HPV that cause 90% of CIN and invasive cancers are : HPV 16, 18, 31, 33, 39, 45, 51, 56, 58, 59, 68.

- Type 16 is the most common (47%).
- Type 18 is present in about 23% of the cases with invasive cancers.
- Usually HPV infection does not persists for a long time.
- In vast majority, the infection will clear in 9–15 months.
- Persistent, high-risk HPV infection increases the risk of CIN 3 and invasive cancer.

Q. How do you diagnose a case with CIN?

Ans. A. Cervical cytology screening: Pap test reduced cervical cancer by 79% and the mortality by 70%. Pap test errors could be due to several reasons: in sampling, smear preparation, fixation (two thick, two thin or bloody smear) or even in interpretation. False negative rate of Pap smear—upto 25%. To reduce false- negative errors of Pap test, liquid based cytology (LBC) is used. Screening of cervical cytology by automated microscope with digital camera and review by expert cytopathologist is done. These methods can reduce the False negative rate by 32%.

Bethesda system of cervical cytology reporting is uniform.

Q. What is the current recommendation for cervical cytology screening (ACOG. 2009)?

Ans. Initial screening: At the age of 21 or 3 years after sexual activity.

Interval: Every year for three years with either LBC or Pap smear.

Interval: When three consecutive yearly smears are negative, then- every 2–3 years. (after age 30 with 3 consecutive yearly normal smears).

Discontinue: No upper age limit.

Q. Who are the woman who need to be tested for HPV-DNA?

Ans. HPV-DNA testing may be combined with cervical cytology for women older than 30 years of age. Women having both the test results negative, the test interval increased by more than 3 years. The negative predictive value of a double negative test exceeds 99%.

Q. Who are the women who need to be referred to colposcopy clinic?

Ans. 1. Any woman with **cytology screening suggestive of HSIL**, should be referred for colposcopy and directed biopsy.
 2. Persistent CIN-1.
 3. Positive results for HPV - DNA.
 4. Visual inspection with acetic acid (VIA)—Acetowhite lesions are considered for colposcopy examinations and/or biopsy.

Q. What are the abnormal findings on colposcopy?

Ans. Abnormal colposcopic findings are:

- a) White epithelium
- b) Acetowhite epithelium
- c) Punctuation
- d) Mosaic
- e) Atypical blood vessels
- f) Irregular surface contour (ulceration, fragility)

Q. What can we do when colposcopy is not available?

Ans. Schiller's test is done and biopsy is taken from the Schiller's unstained area (positive).

(i) Endocervical curettage is mandatory.

Q. When conization of cervix is to be done?

Ans. Diagnostic conization may be done in cases where—

- a) Entire limits of the lesion is not visible even with colposcopy.
- b) Transformation zone (SCJ) is not seen.
- c) Normal colposcopic finding but there is abnormal cytology.
- d) Cases with CIS or microinvasion on biopsy, to exclude invasive cancer.
- e) Endocervical curettage (ECC) is positive for CIN-2 or CIN-3.
- f) Cases with atypical glandular cells.

Q. What are the treatment options for CIN?

Ans. 1. CIN-I: Spontaneous regression rate of CIN-1 is 60% to 80%. Patients may be followed up with Pap testing at 6 and 12 months interval or HPV-DNA testing at 12 months.

Results are analysed:

(a) Both the results negative → Routine screening yearly is done.

(b) Persistent CIN 1 (LSIL) after 2 years, → Expectant management and follow up cytology or ablative therapy (Cryo) or excisional procedures like LLETZ or LEEP is done.

2. CIN-2 and 3: Excisional methods → LLETZ / LEEP (see p 448)

Follow up: Women need to be followed up at 6 months interval with cytology, colposcopy or HPV-DNA. Recurrence risk may be upto 10%.

Q. What are the different methods of ablative therapy available?

Ans. Methods are:

- (i) Cryotherapy
- (ii) Electrodathermy
- (iii) Laser vaporization
- (iv) Cold coagulation.

Q. What are the different excisional methods?

Ans. Excisional methods are:

- (i) Large loop excision of the transformation zone (LLETZ) or loop electrosurgical excision procedure (LEEP)
- (ii) Conization
- (iii) Hysterectomy in a selected case.

Q. What are the conditions where ablative therapy could be done?

- Ans.**
- (a) No evidence of microinvasive or invasive disease
 - (b) The lesion is on the ectocervix and is seen entirely
 - (c) No involvement of endocervix.

Q. What are the indications of hysterectomy for cases with CIN ?

- Ans.**
- (i) Elderly women with persistent CIN-2 or CIN-3
 - (ii) Cases with microinvasion
 - (iii) Presence of other gynecological problems (fibroids, PID and AUB), needing hysterectomy. Poor compliance for follow up.

TOPIC – 6: AMENORRHEA

Q. What is amenorrhea?

Ans. Amenorrhea literally means absence of menstruation.

Q. How do you define primary amenorrhea?

Ans. A young girl who has not menstruated by 16 years of age (16th birth day) is considered primary amenorrhea.

Q. What are the common causes of amenorrhea?

Ans. Amenorrhea may be:

I. Physiological:

- (a) Before puberty, (b) following menopause, (c) during pregnancy and (d) during lactation.

II. Pathological:

- (a) Cryptomenorrhea, (b) primary amenorrhea, (c) secondary amenorrhea.

PRIMARY AMENORRHEA

Q. What are the common causes of primary amenorrhea?

Ans. A. Hypogonadotropic hypogonadism:

- (i) Delayed puberty due to delayed GnRH pulse reactivation.
- (ii) Hypothalamic pituitary dysfunction—Stress, weight loss, anorexia nervosa, chronic illness (tuberculosis), Kallmann's syndrome (deficiency of GnRH)

B. Hypergonadotropic hypogonadism:

- (a) Primary ovarian failure, (b) galactosemia.

C. Abnormal chromosomal pattern:

- (i) Turner's syndrome (45 XO)
- (ii) Pure gonadal dysgenesis (46XX or 46YY)
- (iii) Androgen insensitivity syndrome (testicular feminisation syndrome), 46 XY

D. Developmental defect:

- (i) Imperforate hymen
- (ii) Transverse vaginal septum
- (iii) Absence of uterus in **MRKH syndrome**.

E. Others:

- (i) Cretinism, (ii) tuberculosis, and (iii) Malnutrition.

SECONDARY AMENORRHEA

Q. How do you define secondary amenorrhea?

Ans. Absence of menstruation for 6 months or more in a woman who has menstruated normally in the past.

Q. What are the common causes of secondary amenorrhea?

Ans. Common causes of secondary amenorrhea are:

1. **Uterine factors:** (a) Synechiae (Tuberculosis) and (b) hysterectomy
2. **Ovarian factors:**
 - (i) Polycystic ovarian syndrome, (ii) Premature ovarian failure, (iii) pelvic radiation and (iv) bilateral oophorectomy
3. **Pituitary factors:**
 - (i) Adenoma (prolactinoma)
 - (ii) Sheehan's syndrome (pituitary ischemia causing destruction).
4. **Hypothalamic factors:**
 - (i) Stress, (ii) trauma – accidents, (iii) infection (tuberculosis), (iv) tumor.
5. **Adrenal:** Adrenal tumor/hyperplasia—causing excess androgen production.
6. **Thyroid:** Hypothyroid state.
7. **Medical illness:** Tuberculosis.
8. **Iatrogenic: Drugs**—Antihypertensives (reserpine), psychotropic (phenothiazines), tricyclic antidepressants.
Other drugs: Metoclopramide and opiates.

Q. What most common cause should be excluded in the diagnosis of amenorrhea?

Ans. A thorough history taking and physical examination is needed. Very often this will lead to the correct diagnosis. History of sexual contact is important. **Pregnancy is the most common cause of amenorrhea in a woman of reproductive age.**

Q. What is cryptomenorrhea?

Ans. When there is periodic shedding of endometrium and bleeding but menstrual blood fails to come out from the genital tract due to obstruction in the passage.

Q. What are the common causes of cryptomenorrhea?

Ans. Causes may be: **A. Congenital and B. Acquired**

A. Congenital

- a. Imperforate hymen
- b. Transverse vaginal septum
- c. Agenesis of upper part of vagina and the cervix.

B. Acquired

- a. Cervical stenosis following amputation, conization or cauterization
- b. Vaginal atresia following traumatic and difficult vaginal delivery (forceps).

Q. What is progesterone challenge test?

Ans. The test is performed by giving parenteral progesterone in oil 75 mg deep IM or tablet medroxyprogesterone acetate 10 mg twice daily orally for 5 days. A positive test means bleeding (even spotting) within 10 days of the test.

Q. What is the significance of positive progesterone challenge test?

Ans. Positive progesterone challenge test means:

- a) Intact Hypothalamo Pituitary Ovarian axis
- b) Serum level of estrogen (E_2) is ≥ 40 pg/ml
- c) Anatomical patency of the outflow tract
- d) Endometrium is responsive

Q. What should be the next step when progesterone challenge is negative?

Ans. Combined estrogen -progesterone challenge test.

Q. What is the significance when withdrawal bleeding occurs following Oestrogen – progesterone challenge test?

Ans. It indicates presence of responsive endometrium but the level of endometrium estrogen is inadequate. The underlying defect may be in the ovary or in the pituitary gland.

Q. What is the significance of negative result of estrogen-progesterone challenge test?

Ans. A negative oestrogen-progesterone challenge test suggests:

- 1) Local endometrial pathology like—
 - a) Complete destruction of endometrium as in uterine synechiae.
 - b) Endometrial fibrosis, severe endometritis.
 - c) Outflow tract obstruction: Cervical stenosis, uterine agenesis or transverse vaginal septum.

Q. What other tests should be performed for a woman with amenorrhea (with normal anatomical tract), who had no bleeding on progesterone challenge test?

Ans. Evaluation of thyroid function (serum TSH), and serum levels of prolactin, FSH and LH.

Q. What is the significance of performing FSH and LH estimation?

Ans. This test will differentiate between the cause of low oestrogen levels.

- A. If the serum FSH level is low (< 5 mIU/ml), it indicates hypothalamo-pituitary level of dysfunction (hypogonadotropic hypogonadism).
- B. High levels of FSH (> 40 mIU/ml) suggest ovarian failure (hypergonadotropic hypogonadism).
- C. When the levels of LH ≥ 10 mIU, and/or LH:FSH is > 3 , it suggests polycystic ovarian syndrome (PCOS).

CHAPTER

13

Gynecology Short Questions

Chapter Objectives

Short Questions: Model answers are provided to develop the art of writing in a concise way with important and updated information. Presentation needs to be focused.

Q.1**All pregnant women should be offered screening for HIV infection in early pregnancy—Justify**

Ans. Human immunodeficiency virus (HIV) infection which leads to acquired immunodeficiency syndrome (AIDS) is an incurable disease. The prevalence of HIV infection (seropositivity) among Asian pregnant women is less than 0.5%. In India it varies from one zone to the other.

The main modes of transmission of HIV are :

- (i) sexual contact
- (ii) transplacental
- (iii) exposure to infected blood or tissue fluid and
- (iv) through breast milk.

Once the mother is infected, perinatal transmission is high. Vertical transmission is about 14–25%. Transplacental transmission occurs in early pregnancy. But majority (40–80%) occurs during the labor. Breastfeeding increases transmission by 14%.

Prevention of parent to child transmission (PPTCT) or mother to child transmission (MTCT) of HIV infection is a major step against the spread of the AIDS. Therefore all pregnant women attending the prenatal (antenatal) clinic should be counseled and offered screening for HIV infection in early pregnancy. Presently integrated counseling and testing (ICT) in the antenatal clinic (ANC), to all pregnant women with an 'Opt out' approach is offered. The woman is counseled with the risk of HIV transmission to the fetus, and termination of pregnancy is offered. However, if the woman is found seropositive and desires to continue pregnancy, several steps are taken to reduce the spread of the infection as minimum to the fetus, neonate and the others in the society (health care staff). Use of highly active antiretroviral therapy (HAART), elective cesarean delivery, avoidance of breastfeeding can reduce the risk of vertical transmission to only 2%. Further to this, the neonate is treated with zidovudine syrup. Barrier methods of contraction is prescribed to prevent further HIV transmission. All the measures against the spread of infection (PPTCT) can only be adopted once the woman is adequately counseled and offered the screening. Therefore it is the screening that is important. However health awareness programs and practice of safer sex are the other important steps. Considering these benefits, all pregnant woman should be counseled and offered the screening for HIV in early pregnancy to prevent the spread of this serious infection.

Q.2**Hormone replacement therapy should be advised in all post-menopausal women—critically evaluate**

Ans. Menopause is often associated with **a number of symptoms**. These are: **vasomotor** (hot flush), **genital and urinary symptoms** (atrophic changes, dyspareunia and dysuria), **psychological** (anxiety, mood swing, insomnia, irritability, depression), **osteoporosis** and **fracture** of bones, **cardiovascular** (coronary artery disease) and **cerebrovascular** disease. All these lead to significant morbidity and mortality in post menopausal women. These are mainly due to deficiency of estrogen with the onset of menopause. Menopause may be either natural (normal) with age or abnormal:

(i) premature or (ii) artificial—surgical or radiation induced.

Hormone replacement therapy (HRT) can improve these symptoms which are often distressing to the woman. There are certain benefits of HRT that are evidence-based. These are: improvement of vasomotor symptoms, urogenital atrophy and bone mineral density. HRT reduces the risk of vertebral and hip fractures. There are several preparations used for HRT namely estrogen, combined estrogen and progestin and others. Selection of HRT should be made depending upon the need of the woman and also whether her uterus is intact or has been removed (hysterectomy).

On one side, there are certain benefits of HRT but at the same time there are **some risks**. The risks are: breast cancer, endometrial cancer, venous thrombo-embolism, coronary artery disease and altered lipid metabolism. There are also certain **contraindications of HRT**. These are: undiagnosed genital tract bleeding, estrogen dependent neoplasm in the body, active liver and gallbladder disease and history of thromboembolism. But there are **women who are most benefitted with the use of HRT provided they do not have any high-risk factor or any contraindication**. This group includes women with premature ovarian failure, gonadal dysgenesis and women with surgical or radiation menopause. HRT is really helpful to (i) relieve the menopausal symptoms, (ii) to prevent osteoporosis and (iii) to maintain the quality of life in the menopausal years.

However there are many nonhormonal methods of treatment that can be used for the problems of menopause. Currently there are some changes in the knowledge and management of menopause. Changes in lifestyle, exercise, intake of calcium and vitamin D are found beneficial in the management of menopause. Considering all these, **there are selective women who are really benefitted with HRT rather than all**. But it is imperative that every individual woman should be given **informed choice of HRT** based on the current knowledge of benefits and risks.

Q.3

Laparoscopy is complementary to hysterosalpingography in evaluation of female infertility—Justify

Ans. In the evaluation of female infertility both the laparoscopy and hysterosalpingography are used primarily for the detection of the patency of the fallopian tubes.

Hysterosalpingography (HSG) can detect any block in the fallopian tube specifically with regard to the side and site. This information is essential from the management point of view. Besides the tubal patency, HSG can give **many useful information** as regard the detection of uterine malformation (septate or subseptate uterus), cervical incompetence, uterine synechiae, any submucous polyp or fibroid. Appearance of the tube on HSG is also informative as regard the pathology (hydrosalpinx, tubal diverticula and beaded appearance). **It is a noninvasive test and is relatively simple.** However it has got certain **contraindications** (pelvic infection) and **complications** (pelvic pain and infection).

On the other hand, laparoscopy has got certain **advantages over and above that of HSG.** It can diagnose **peritubal adhesions**, and pelvic **endometriosis**. It can detect **ovarian pathology** (PCOS changes and endometriosis). Chromopertubation is helpful to study the nature of tubal motility besides tubal patency. Therefore **laparoscopy helps to evaluate the pelvic, ovarian and the peritoneal factors for infertility besides that of tubal patency.** These pathologies are often considered as the important female factors for infertility.

Laparoscopy is also useful for the treatment of such pathologies. Laparoscopic **ovarian drilling** for PCOS and **salpingolysis** for peritubal adhesions are helpful to improve fertility. Laparoscopic electrofulguration of pelvic endometriotic implants is done to improve fertility as well as to improve the symptoms of pelvic pain in women. However, laparoscopy cannot evaluate the uterocervical factors that can be diagnosed with HSG. Laparoscopy is an **invasive procedure** and needs general anesthesia. It is expensive compared to HSG and it needs specialized training. Considering the benefits and limitations, the two procedures (HSG and laparoscopy) are regarded as complementary to each other.

Q.4**Chemotherapy is the mainstay of treatment in choriocarcinoma**

Ans. Choriocarcinoma is a highly malignant tumor arising from the chorionic epithelium. It is not a tumor of the uterus and uterus is involved secondarily. About 3–5% of all patients with molar pregnancies develop choriocarcinoma.

Chemotherapy is the mainstay in the treatment as chemotherapy is found to be highly effective. Depending upon the risk factors, either single drug or multidrug regimen is used. In general, patients with nonmetastatic (low risk) and good prognosis (score < 7) disease, are treated with single drug (methotrexate or actinomycin). Methotrexate is an antimetabolite and acts as folic acid antagonist. Methotrexate has many side effects affecting the gastrointestinal, hemopoietic and other systems. Folinic acid is combined with methotrexate to minimize the side effects. Whereas patients with poor prognosis, metastatic (**score ≥ 7 disease, are treated with multidrug regimen (EMA-CO).** Drugs combined in this protocol are etoposide, methotrexate, actinomycin D, cyclophosphamide, vincristine and folinic acid. During the course of chemotherapy serum hCG levels should be estimated at 1 week interval. Chemotherapy should be changed if there is no fall in hCG by at least 25% after each treatment cycle. Usually 1–3 additional cycles of chemotherapy are given following normalization of serum hCG level. This is done to prevent recurrence of disease.

Prognosis with this regimen of chemotherapy is found satisfactory. **Cure rate is almost 100% in low-risk and about 70% in high-risk metastatic groups.** Young women can have pregnancy 1 year after successful completion of chemotherapy. Chemotherapy has got no adverse effect to the fetus. **Primary hysterectomy has got a limited place unless the tumor is found resistant to chemotherapy.** Considering all the benefits and its high efficacy, chemotherapy is considered the mainstay in the treatment of choriocarcinoma.

Q.5

Early diagnosis of ovarian cancer is still not possible—Give reasons

Ans. Ovaries are deep seated organs. Unlike cervix, ovaries are not easily accessible by clinical evaluation (inspection, palpation or bimanual examination). Epithelial ovarian cancers are common. Unlike that of cervical intraepithelial neoplasia (CIN), **ovarian cancer has got no preinvasive stage**. No age is specific to ovarian cancer. The disease has got **no specific symptoms**. It remains **asymptomatic in about 15–20% of cases**. Duration of **symptoms** has got no correlation with the stage of the disease. Even with symptoms of short duration, the disease may have extensive spread and advanced stage. **The tumor size** again has got no correlation with the stage of the disease. A big tumor may remain benign whereas a small tumor may be malignant with advanced stage. Unlike cancer cervix, there is **no effective screening procedure for ovarian malignancy**. Tumor markers like CA-125, OVXI, HER-2 neu and inhibin are extensively studied. The commonly tested tumour marker for epithelial ovarian cancer is CA-125, value ≥ 35 U/ml is suggestive of epithelial ovarian cancer. **Unfortunately the tumor marker is nonspecific**. There are several other conditions, where the level of CA-125 is found raised (normal woman, endometriosis, peritonitis, carcinoma of breast, colon and endometrium).

Early diagnosis of ovarian cancer with ultrasound imaging has been attempted. Transvaginal ultrasound with color Doppler imaging has been found helpful to differentiate a malignant ovarian tumor from a benign one. Currently three dimensional contrast enhanced, power Doppler sonography is being done for more information.

Risk of malignancy index (RMI) has been evaluated. **High value of RMI (> 250) correlates with high risk of ovarian cancer (75%). In spite of all these progresses in the screening methods, improvement in early detection of ovarian cancer has not yet been possible**. There are few high-risk women for epithelial ovarian cancer like age ≥ 40 years and familial cancer (breast and ovary), history of induction ovulation. **In spite of all these, risk evaluation, screening and detection procedures, diagnosis of ovarian cancer is late and often in the advanced stage.**

Unless detected early and at a curable stage, survival of women with ovarian cancer is poor. Because of these reasons, the 5 years survival rate of ovarian cancer has remained the same (35%) over the last 3 decades.

Q.6**Justify the place of HSG in the work up protocol of female infertility.**

Ans. Work up protocol of female infertility needs evaluation of the following parameters: (i) ovulatory factors (30–40%), (ii) tubal and peritoneal factors (25–35%), (iii) endometriosis (1–10%) and uterine and cervical factors (15–20%). Of all these different factors responsible for female infertility hysterosalpingography can detect the tubal, uterine and cervical factors.

HSG is a noninvasive procedure that can assess the cervical canal, uterine cavity and the lumen of the tube including tubal patency. Compared to laparoscopy it is less expensive. HSG can be done in the work up protocol of female infertility **for the following informations:**

- (i) Patency of the fallopian tubes.
- (ii) Uterine malformation (bicornuate and septate uterus) in cases with recurrent miscarriages.
- (iii) To detect cervical incompetency (midtrimester recurrent miscarriages).
- (iv) To diagnose uterine synechiae.
- (v) To detect any submucous fibroid or polyp.
- (vi) Tubal outline in HSG can be helpful to detect the type of pathology (hydrosalpinx due to infection or beaded appearance due to tuberculosis).
- (vii) HSG can demonstrate the side and site of tubal block.

However HSG has to be done aseptically to avoid the **risk of infection. It should not be done** in cases with pelvic infection.

So HSG is an important tool in the work up protocol of female infertility when done carefully and selectively.

Q.7**Selection of cases must be meticulous before prescribing HRT**

Ans. Women with symptoms of **estrogen deficiency** are the cases for prescribing hormone replacement therapy (HRT). **Generally the postmenopausal women** are the main group who often suffer from the hazards of estrogen deficiency.

Health hazards are due to vasomotor instability, urogenital atrophy, osteoporosis and fracture, cardiovascular disease, cerebrovascular disease, psychological changes and changes in skin, collagen tissue and hair. However not all the postmenopausal women suffer from these hazards. **Therefore HRT should not be prescribed as a routine. Besides HRT, many women may be benefitted** with dietary changes (calcium and vitamin D supplementation), exercise and other nonhormonal methods (bisphosphonates). HRT includes many preparations and they can be used by different routes (oral, subdermal implants, skin patches and skin or vaginal cream). The **selection of HRT** for an individual woman is different depending on whether her uterus is intact or removed (hysterectomy). This is also important depending on her lifestyle and severity of symptoms.

Generally there are women who are **benefitted with HRT**. They are: women with menopausal symptoms, osteoporosis and women who wish to improve quality of life in the menopausal years. However other group of women are premature ovarian failure, gonadal dysgenesis and women with surgical or radiation menopause. But there are certain **definite contraindications to the use of HRT. These are:** undiagnosed genital tract bleeding, estrogen-dependent neoplasm in the body, history of venous thromboembolism, active liver disease, gallbladder disease. One should be very careful to exclude these women before prescribing HRT. Again there are **certain risks of HRT**—these are endometrial cancer, breast cancer, venous thrombo-embolism, coronary artery disease, abnormal lipid metabolism and dementia. Women having all these risk factors already present should be counseled before prescribing HRT. Women should be informed about the other nonhormonal (calcium and SERMS) methods of management. Therefore **women should be counseled not only with the benefits of HRT but also with the risks involved in it and other alternatives including non-hormonal methods of management.** Compliance for use of HRT and regular follow up is also important and should be counseled. Considering all these, selection of cases must be meticulous before prescribing HRT.

Q.8**Staging of ovarian cancer is essentially surgicopathological one — Give reasons.**

Ans. Clinical diagnosis of ovarian cancer is very imprecise. **The reasons for difficulties in clinical diagnosis are:** (a) No specific symptoms, (b) severity of symptoms and the duration of symptoms has got no correlation to the spread or extent of the disease, (c) Tumor size assessed clinically has got no correlation to the stage or spread of the disease.

There are several ancillary aids to the diagnosis, like:

(i) detection of malignant cells on abdominal paracentesis, (ii) diagnosis of malignancy with noninvasive methods like sonography, MRI or CT scan, and (iii) estimation of serum CA 125. These methods are also ineffective to confirm the diagnosis of malignancy and to assess the actual spread or stage of the disease.

Correct staging of ovarian cancer can only be made by a systematic exploration on laparotomy and confirmation by biopsy (histology).

Presence of tumor limited to pelvis or spreading to para-aortic lymph nodes, liver, under surface of diaphragm has got different prognostic outcome. Therefore presence of tumor metastasis to different sites are grouped into different stage of the disease by FIGO.

The practical guideline for surgical procedures includes a systematic exploration (visual and manual) of all pelvic and abdominal viscera for any metastatic deposit and lymph nodes (pelvic and para-aortic) involvement. All these areas of spread need cytological and/or histological confirmation.

There are several prognostic factors for survival outcome of ovarian malignancy. These are: (i) spread of the disease (surgical stage), (ii) histological type, (iii) histological grade, (iv) peritoneal cytology, (v) presence of ascites, (vi) presence of metastatic disease, (vii) volume of residual tumor after primary surgery, (viii) ploidy status and (ix) the degree of oncogene expression. These informations can only be obtained by a combined approach of a systematic surgical exploration and pathological confirmation by taking biopsy.

Moreover only with accurate staging, the prognostic outcome and the comparison of results following different modalities of therapy is possible.

Hence staging of ovarian carcinoma is essentially a surgicopathological one.

Q.9

Laparoscopy is an important diagnostic tool in gynecology—analyze critically.

Ans. Laparoscopy is an operative procedure for visualization of peritoneal and pelvic cavity by means of a fibre optic endoscope introduced through the abdominal wall. It gives an opportunity of **seeing pelvic and abdominal organs and their pathology directly**. It is also possible to take tissue for biopsy. Moreover it is also useful **to treat many such pathologies** at the same time. Diagnosis of many pelvic pathologies, may not be possible only clinically or even when combined with other diagnostic aids like sonography. **In these situations laparoscopy is superior to others.**

There are many conditions when **diagnostic laparoscopy may be of immense value**. Some of the conditions are:

- (a) **Infertility work up:** Detection of tubal patency, peritubal adhesions, ovulation stigma on the ovary and assessment of the tubes before reversal of sterilization operation.
- (b) **Pelvic endometriosis:** Diagnosis (minimal or mild disease) and stage of the disease.
- (c) **Chronic pelvic pain:** It is done in women where pathology is not detected clinically.
- (d) **Acute pelvic lesion:** For exclusion of ectopic pregnancy and acute appendicitis.
- (e) **Suspected mullerian abnormalities:** Uterine and ovarian pathologies (PCOS, endometrioma).
- (f) **Detection of uterine perforation:** Accidental during dilation and curettage.
- (g) **Amenorrhea for detection of pathology:** Uterine, ovarian or pelvic pathology (tuberculosis).
- (h) **Follow up following pelvic surgery:** Tuboplasty, ovarian malignancy (second look) and pelvic endometriosis.
- (i) **Differentiation** of a clinically palpable pelvic mass (fibroid and ovarian cyst).

However laparoscopy is an **invasive procedure**. It needs specialized training on the part of the surgical team. It is done under anesthesia. Laparoscopy has got **few contraindications**: (i) severe cardiopulmonary disease, (ii) hemodynamically unstable patient, (iii) generalized peritonitis, (iv) intestinal obstruction, (v) large pelvic tumor or pregnancy >16 weeks, (vi) previous periumbilical surgery (relative), (vii) extreme obesity. There are certain situations where laparoscopy has a **complementary role** (e.g. HSG and laparoscopic chromopertubation). Considering all these benefits laparoscopy is regarded as an important diagnostic tool in gynecology.

Q.10 Combined oral contraceptive is the ideal method of contraception for a newly married woman—justify the statement

Ans. Contraception for a newly married woman should be safe, effective, reversible, simple to use and without any significant side effects. Such a contraceptive method should not have any adverse effect on the woman in relation to her future pregnancy. Usually a newly married woman needs the contraception for a short period of time (usually 1–2 years) only.

Considering all the points mentioned above, combined oral contraceptive (COC) is ideal one. Moreover compared to other available methods (barriers, IUCD and injectables), **COC is user friendly, safe, and failure rate is minimum (0.1 per 100 women years).**

Barrier methods has got high failure rates. Barrier methods (condoms) may not be liked by the young couple due to lack of satisfaction. **IUCD** runs the risk of pelvic infection. **Progestin only pills, injectable (DMPA) and implants are expensive and have many side effects** including menstrual abnormalities.

Currently used low dose pills with lipid friendly progestin has got very **minimum side effects**. The **absolute contraindications of COCs (WHO) are only few**. It has been proved that **potential benefits of COC are greater compared to risks in a well-selected individual**.

Above all, use of COC has got **many noncontraceptive benefits also**. Some of these are:

- (i) **Improvement** of menstrual abnormalities.
- (ii) **Improvement of** anemia.
- (iii) **Protection against:** pelvic infections, ectopic pregnancy, endometriosis, functional ovarian cysts and hirsutism.
- (iv) **Protection against** the risk of ovarian cancer (50%), and endometrial cancer (50%) and colorectal cancer compared to the nonusers.
- (v) **Long-term metabolic effect** is not significant on the health of the woman.
- (vi) **Prospect of future pregnancy** following stoppage of drug is quick.
- (vii) **Inadvertent intake of COC** during early pregnancy does not increase the risk of fetal congenital malformation.

However the woman needs to be under follow up for any problem that she faces.

Considering all these above reasons, COCs are considered the ideal method of contraception for a newly married woman.

Q.11 Cervical screening programmes can reduce deaths from cancer cervix — Justify.

Ans. Cancer cervix is the second common cause of cancer death in female throughout the world. Nearly 80% of the deaths are in the developing world. In the developed world incidence of cancer cervix has declined significantly as a result of effective population screening programmes. Cancer cervix has a premalignant (CIN) state and also a microinvasive stage thereafter it becomes an invasive disease. **Duration from CIN to invasive cancer is about 10–15 years.** If the state of CIN or even the microinvasive stage is diagnosed, death from cervical cancer can be prevented entirely.

Early detection of CIN, CIS or microinvasive cancer is possible with different methods of screening and tests. **There are several screening methods for detection of premalignant state of the cervix. These are:**

- (a) **Exfoliative cytology (Pap test) screening:** It is highly effective. False negative rate of Pap smear is 10% and false-positive rate is about 15–20%. To reduce the false-negative and the false-positive rates of Pap smear, liquid-based cytology (LBC) has been recommended (NICE). Cytology screening has reduced incidence of cancer cervix by nearly 80% and cervical cancer death by 70%.
- (b) **Colposcopy:** Cases with abnormal cytology (moderate to severe dyskaryotic smear) are referred to colposcopic evaluation and directed biopsy.
- (c) **Visual inspection with acetic acid (VIA)** is a method where acetowhite area of the cervix is considered abnormal. Biopsy is taken from abnormal area.
- (d) **Lugol's iodine** (5%) use and cervical biopsy from the unstained areas is an alternative method to colposcopic directed biopsy.
- (e) **Human papilloma virus (HPV)** is currently considered the etiologic agent of cancer cervix. **Over 99.7% of women with CIN and cancer cervix are found to be positive with HPV-DNA.** Detection of HPV-DNA in cervical discharge is possible by **hybrid capture** technique and **using polymerase chain reaction (PCR)**. HPV-DNA testing is accepted as an important method of screening for cancer cervix. **Vaccines have been developed against the high risk group of HPV 16 and 18. Vaccines are effective against the development of cancer cervix.**

Cervical pathology once detected by any screening method in the cervical intraepithelial neoplasia (CIN) state or even in the microinvasive stage, can be cured completely. Different modalities of treatment are available for CIN (local excisional methods or electrodiathermy). In view of the above reasons cervical screening programs are effective in reducing death from cancer cervix.

Q.12 Misoprostol has almost replaced the other methods for termination of pregnancy—comment

Ans. **Misoprostol** is a synthetic prostaglandin analogue (PGE_1). Currently misoprostol is most commonly used for medical termination in the first as well as in the second trimesters of pregnancy. It **stimulates myometrial receptors to cause strong myometrial contractions**. It also **causes cervical softening and dilatation**. As a result there is expulsion of the products of conception.

In the first trimester, it may be used either alone or in combination with other drugs like mifepristone (200–600 mg) or methotrexate (50 mg/ M^2). Standard drug regimen includes 1 tab (200 mg) mifepristone on day-1 followed by misoprostol 400 μg either oral or vaginal on day-3. Efficacy of this regimen is upto 95–98% when used with gestation \leq 49 days. **Combipack** (1 tab mifepristone 200 mg and 4 tab misoprostol 200 mcg each) is approved upto 63 days of pregnancy (DGHS – 2008). In 50% cases expulsion occurs within 4–5 hours of misoprostol intake. Other evidence-based regimen has shown that **lower dose mifepristone** (200 mg) and **higher dose misoprostol** (800 μg vaginal or sublingual) increases the efficacy of abortion (95%) upto 63 days of pregnancy.

For **second trimester pregnancy termination** the commonly used regimen is misoprostol 400 μg intravaginally every 6 hours. **Vaginal route misoprostol is more effective than oral administration**. When used in the second trimester, success rate of vaginal misoprostol is 86% within 24 hours.

Misoprostol has been found highly effective and safe in many clinical trials for medical termination of pregnancy (MTP). It is acceptable and privacy is maintained.

The **common side effects are**: Vaginal bleeding, cramping abdominal pain and nausea. The woman should be counseled and explained of the side effects. She should be assured of medical help in case of any emergency. **Complications** of misoprostol induced abortion are rare (0.5%). Incomplete abortion occurs in 3% of cases. This can be managed by giving additional misoprostol or by suction curettage. Risk of endometritis is rare (0.09%). The maternal death rates remain 1 woman per 100,000 use.

Benefits of misoprostol compared to surgical methods: No risk of injury to cervix, uterine perforation, anesthetic reaction, hemorrhage, infection (endometritis), Asherman syndrome, infertility, chronic PID or psychologic problems.

Considering all the safety, efficacy and benefits, misoprostol has almost replaced the other methods for termination of pregnancy.

Q.13 Phenotypically females are not always genetically females—justify

Ans. The development and differentiation of male and female external and internal genital organs are dependent on several factors that start working as early as 6–7 weeks of embryonic life. **In the differentiation of a bipotential gonad to testis needs the active drive of SRY gene present on the short arm of Y chromosome.** Absence of SRY gene leads to the development of ovary in a passive way. **Regarding the development and differentiation of Wolffian duct and regression of mullerian duct, the secretion of testosterone (from Leydig cells) and anti-mullerian hormone (from Sertoli cells) are essential.** Conversion of testosterone to dihydrotestosterone is the factor for development of male external genitalia. On the other hand absence of testosterone and AMH leads to the development of Mullerian duct, regression of wolffian duct and development of female external genitalia. Therefore an individual with absent SRY gene, though the chromosomal complement is 46 XY, the gonadal and ductal development is towards female (XY gonadal dysgenesis).

Many developmental anomalies of the external genitalia and ambiguity of sex are usually genetic in origin.

Individuals with gonadal dysgenesis, though phenotypically female, are chromosomally male (46 XY). Individuals with androgen insensitivity syndrome are phenotypically female due to the inability of endorgans to respond to androgens though chromosomally they are males (46 XY). It is also true with individuals of Klinefelter's syndrome (46 XXY) and with true hermaphroditism (46 XY).

Therefore it is justified to say that not all phenotypical females are genetically females.

Q.14 Laparoscopic tubectomy has many advantages — Evaluate critically

Laparoscopic tubal sterilization is a very popular method throughout the world. Compared to open methods (laparotomy) laparoscopic procedure has got many advantages.

This procedure can be done in the interval period, concurrent with vaginal termination of pregnancy (S/E) or 6 weeks following delivery (postpartum). It can be done either with single or double puncture technique. The tubes can be occluded by a silastic ring (Falope ring), Filshie clip or by electrosurgical methods (diathermy or laser).

In India laparoscopic tubectomy is commonly done with the use of Falope ring or Filshie clip (less used).

The advantages are:

(1) **Like any endoscopic surgery**, it has all the advantages:

- (a) Rapid recovery
- (b) Shorter hospital stay (day care basis)
- (c) Quicker resumption of day-to-day activity
- (d) Less adhesion formation and
- (e) Minimal abdominal scar.

(2) **Failure rate:** When the procedure is done using Falope ring or by Filshie clip, it is only 0.1%. Electrosurgical method has got higher failure rate.

(3) **Reversibility:** Only about 2–3 cm of the tube is destroyed when Falope ring is used or 4 mm of the tube is destroyed when Filshie clip is used. So the chances of reversibility are high.

However, laparoscopic equipments are expensive, surgeon must be specially trained and the case must be well-selected to get the benefits because the procedure has a few complications too.

Q.15 All adolescent girls should be given HPV vaccine — justify

Ans. Cancer of the cervix is the most common gynecological cancer in women of the developing countries. **It is an important cause of cancer death in India.** This is because screening facilities are inadequate. Cervical cancer is a preventable disease as the screening procedures like cytology and HPV-DNA detection are effective. There is significant reduction in death from cervical cancer in all the developed world due to effective screening, early detection and treatment in the preinvasive stage. The diagnostic and therapeutic procedures for early disease is also very effective. It has a long (10-14 years) precancer phase (CIN) which once detected can be treated effectively and the disease is cured entirely.

Over 99 percent of patients with CIN and invasive cancer are found to be positive with HPV-DNA. HPV has been considered the causative agent of cancer cervix. HPV vaccine is found to be effective when given prophylactically to all school girls (9-15 years) and women (16-25 years). This vaccine is recommended as a primary measure of prevention against cervical cancer.

The reasons that adolescent girls should be given the vaccine are:

(i) Adolescent girls (12-13 years) are usually not sexually active, (ii) vaccine when given at this age, it confers immunity by the time the adolescent becomes sexually active and (iii) the impact of vaccine is greatest when given in women who are not infected with HPV.

There are two vaccines available now. The **bivalent vaccine** (cervarix) gives protection against HPV type 16 and 18 which are responsible for 70% of all cervical cancers. The **quadrivalent vaccine** (Gardasil) works against HPV types 16, 18, as well as 6 and 11. The HPV type 6 and 11 are responsible for anogenital warts.

The vaccines are type specific and they work when given prophylactically. The vaccines are given IM (over the deltoid muscle) in three doses with a schedule of 0-1 and 6 months (cervarix) or 0-2 and 6 months (Gardasil). Once a complete course is given the immunity lasts for more than 6 years. Vaccines are safe and well-tolerated with no evidence of teratogenicity. There is no such recommendation for booster dose as yet. However the woman should undergo routine cytology screening even if she is immunized with HPV vaccine. The vaccine works by increasing the levels of antibodies (IgG and IgA) locally in the cervical secretion. These antibodies prevent the attachment of HPV virus to the cells at the transformation zone. Therefore the vaccine should be given to the adolescent girls as a primary measure of prevention against cancer cervix.

Q.16

Medical methods of termination of pregnancy (TOP) should be the method of choice—Discuss

Ans. Medical methods of TOP is a nonsurgical procedure using a combination of drugs. The commonly use drugs are: (1) Mifepristone (RU 486), (2) misoprostol (PGE₁) and (3) methotrexate (less used).

Mifepristone is an progesterone antagonist and it binds the progesterone receptors in the endometrium and decidua resulting in necrosis and detachment of products of conception. It also softens the cervix and sensitizes the uterus to the effect of postaglandins. The different protocols of medical methods are given in the table below:

PROTOCOLS FOR USE OF MIFEPRISTONE AND MISOPROSTOL FOR MEDICAL TOP

| | Pregnancy (weeks) | Day of therapy | Drug | Dose | Route | Efficacy | |
|---|---|-------------------|--|--|---|----------|-------|
| A | UP TO 7 weeks (49 days) | D1 D3 | Mifepristone (RU 486) Misoprostol (PGE ₁) | 200 mg 400 mcg (2 tab 200 mcg each) | Oral Oral/ Vaginal | } 95-98% | |
| | UP TO 12 weeks | D1 D3 | Mifepristone Misoprostol | 200 mg 800 mcg (4 tab 200 mcg each) | Oral Vaginal/ Oral | | } 97% |
| | *Combipack (mifepristone 200 mg + misoprostol 800 mcg) has been approved for medical TOP upto 63 days (Director General of Health Services, Govt. of India — 2008) | | | | | | |
| C | UP TO 13-20 weeks | D1 D3 | Mifepristone Misoprostol | 200 mg 400 mcg every 3-6 upto total 5 doses | Oral Vaginal/ Oral/ Sublingual | } 97% | |
| | When mifepristone is not available, misoprostol alone can be used with an efficacy of 84%) | | | | | | |

Misoprostol is a prostaglandin (PGE₁) which stimulates strong myometrial contra-ctions and causes cervical softening and dilatation. It causes expulsion of the conce-ptus from the uterus due to its combined effect on the myometrium and the cervix.

ADVANTAGES OF MEDICAL METHODS OF TOP WHEN COMPARED TO SURGICAL METHODS (S/E OR D/E)

1. It is a simple, safe and highly effective (95–98%) method.
2. Needs minimal or no technical assistance as regard to instruments, operation theater, anesthesia or hospital stay.
3. No effect on future fertility.
4. Complications are rare (0.5%). No risk of cervical injury, uterine perforation, anesthetic reaction, hemorrhage, infection, Asherman syndrome, chronic PID or infertility.

DISADVANTAGES OF MEDICAL METHODS OF TOP

1. Unpredictable outcome in a small percentage of cases.
2. Whole process may take longer time.
3. Surgical method may be needed in a case of failure or due to incomplete expulsion.
4. There is risk of fetal malformation in a case of failure.

Considering all the above issues medical methods of the TOP should be the method of choice.

CHAPTER

14

Viva-Voce in Gynecology

Chapter Objectives

- A wide range of topics (as models) have been discussed with questions of different levels of hardness
- The information is presented in a concise and as much as in simpler language
- The answers provide the up to date information



Viva table in gynecology. Candidate is expected to be familiar with all the items

GYNECOLOGY QUESTIONS AND ANSWERS

1. HYSTEROSALPINGOGRAPH

Q. Describe the skiagram shown in Fig 14.1.

Ans. It is a hysterosalpingographic plate showing the cervical canal, uterine cavity, both the tubes. The HSG cannula is in situ. There is bilateral spillage of dye in the peritoneal cavity.

Q. What is your inference with this HSG ?

Ans. Both the tubes are patent.

Q. What are the indications of HSG?

- Ans.**
- a) To assess tubal patency in a woman with infertility.
 - b) To detect uterine malformations (unicornuate uterus).
 - c) Diagnosis of cervical incompetence.
 - d) Diagnosis of submucous fibroid.
 - e) Diagnosis of uterine synechiae.

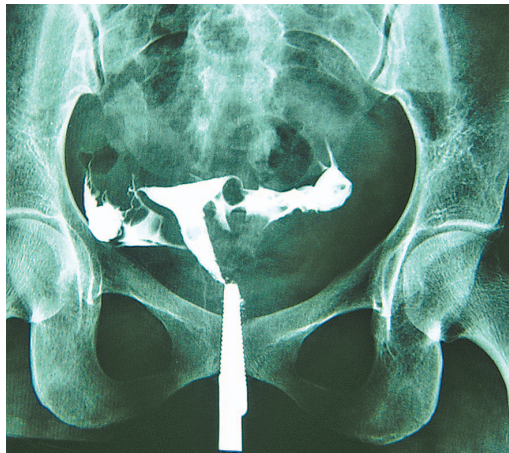


Fig. 14.1: Hysterosalpingogram with bilateral peritoneal spillage

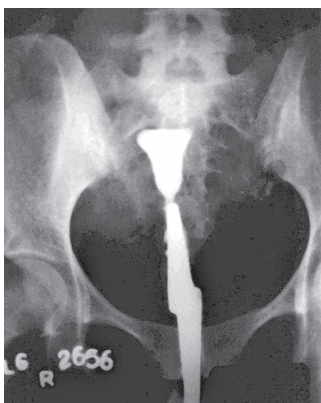


Fig. 14.2: Hysterosalpingogram showing bilateral cornual block. She had a history of MTP

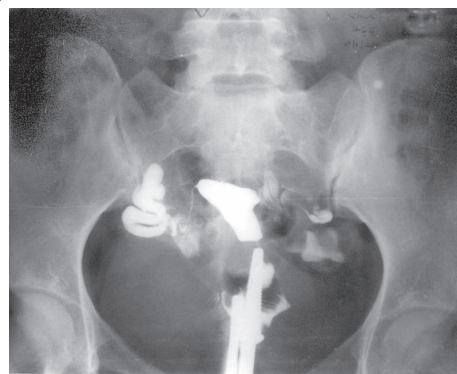


Fig. 14.3: Hysterosalpingogram showing bilateral fimbrial block. Bilateral salpingostomy was done. Thereafter, she suffered an ectopic pregnancy

Q. *In which phase of the menstrual cycle HSG is done?*

Ans. In the first half of the cycle (proliferative phase) between D7 and D10. It is avoided in the secretory phase, as there is risk of pregnancy interference by chance the woman has conceived in that cycle.

Q. *What are the advantages of laparoscopy over HSG?*

Ans. SAQ-3 on p 382.

Q. *What are the other methods for assessment of tubal patency?*

Ans. Laparoscopy and dye test, sonohysterosalpingography, insufflation test, salpingoscopy and falloposcopy.

Q. *What is sono-hysterosalpingography?*

Ans. Normal saline is pushed within the uterine cavity with a pediatric Foley catheter. Thereafter ultrasonography of the uterus, tubes are done. The procedure can detect uterine malformations, synechiae or polyps. This is a noninvasive procedure and without the hazard of radiation.

Q. *What is the management if tubes are found normal ?*

Ans. To evaluate the male factor (semen analysis) and ovarian factor (ovulation) for infertility.

Q. *What other information can be obtained from HSG ?*

Ans. Detection of intrauterine adhesions, submucous fibroids, uterine malformations (bicornuate or septate uterus).

Q. *What is the management of a bicornuate uterus ?*

Ans. It is difficult. Metroplasty or unification (Strassman or Tompkins) operation has been recommended.

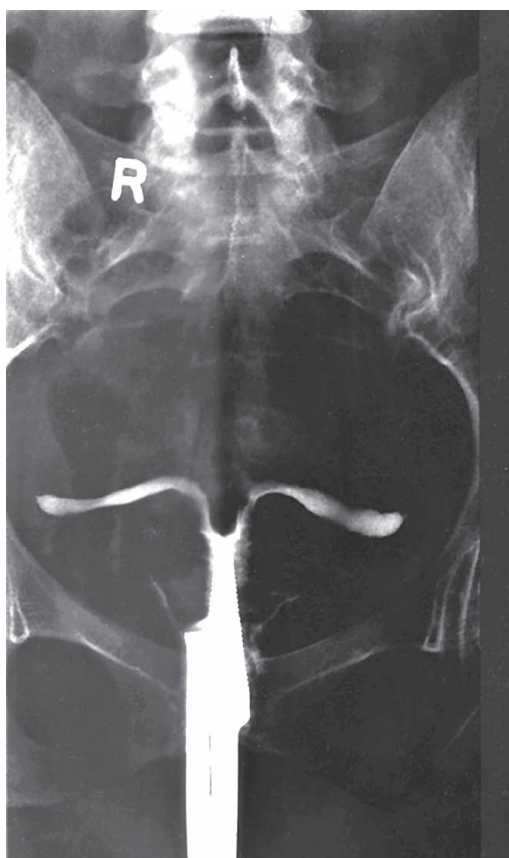


Fig. 14.4: Hysterosalpingogram showing bicornuate uterus. Metroplasty was done for recurrent midtrimester abortion. Subsequently, she had LSCS at 39 weeks and a live baby girl was delivered

CERVICAL SMEAR, CYTOLOGY AND CIN

2. SPATULA AND CYTOBRUSH (Fig. 14.5):

Q. How to take cervical smear ?

Ans. Cervix is exposed with a Cusco's bivalve speculum (Fig. 14.8, p 403) without any lubricant. Prior bimanual examination should not be done. The cells are collected from the ectocervix using the Ayre's spatula and from the endocervix with the cytobrush.

Methods of slide preparation and fixation: The material so collected is immediately spread over a slide. Fixative (95% ether and ethyl alcohol) is then spread over it. Once the slide is dried up, the slide is then stained (in the laboratory) either with Papanicolaou or Sorr's method. It is then examined under the microscope by a cytopathologist.

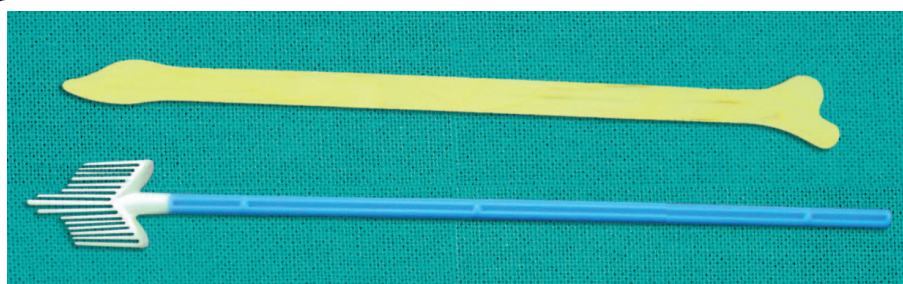


Fig. 14.5: Ayre's spatula (top) and cytobrush (bottom)

Q. Which group of women are at risk and require cervical cytology screening?

Ans. • Any sexually active women over 18 years and under 60 years of age.

Others:

- Multiple sexual partners
- HPV infection
- HIV positive (immune-compromised) women
- Oral pill users.

Q. What is the grading of papanicolaou's smear?

Ans. Grading are total five: (i) Normal, (ii) Infective, (iii) Suspicious, (iv) Few malignant cells and (v) Plenty of malignant cells. However, Bethesda system of classification is currently followed (For details see Dutta Gyne 6/e, p 113).

Q. What is a dyskaryotic smear? What are the different types of dyskaryotic smear?

Ans. Dyskaryosis is the presence of morphological abnormalities of the nucleus.

Nuclear abnormalities may be:

- (i) Increase in number and size
- (ii) Irregular in outline (shape)
- (iii) Multinucleation
- (iv) Hyperchromasia.

Dyskaryotic smear may be graded as:

- (i) Mild, (ii) moderate and (iii) severe.

Q. What is a koilocyte ?

Ans. It is an abnormal cell characterized by nuclear abnormalities due to infection with HPV. The typical changes are: perinuclear halo, nuclear irregularity, hyperchromasia and multinucleation.

Q. What is CIN? How do you diagnose CIN?

Ans. It is the histological abnormality where part or whole of thickness of cervical squamous epithelium is replaced by cells with varying degree of atypia. Basement membrane remains intact.

Diagnosis of CIN is made by:

- (i) Cytology, (ii) VIA, (iii) colposcopy, (iv) cervicography, (v) biopsy or
- (vi) conization of cervix.

Q. How do you manage a case of CIN ?

Ans. CIN can be managed by (see p 375) (i) Local ablative methods, (ii) excisional methods or by (iii) hysterectomy

3. RETENTION OF URINE IN GYNECOLOGY (Fig. 14.6)

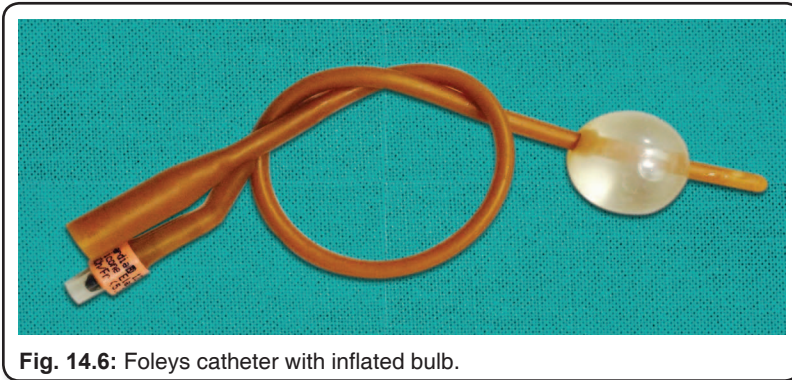


Fig. 14.6: Foleys catheter with inflated bulb.

Q. What are the causes of acute and chronic retention of urine ?

Ans. Postoperative (common), (ii) obstructive (due to growth, vaginal packing), (iii) failure of detrusor contraction (epidural anesthesia), (iv) External sphincter spasm (perineal injuries) and (v) others.

Q. What are the menstrual abnormalities that may manifest with retention of urine?

Ans. (A) **Primary amenorrhea, Cryptomenorrhea**

(Hematocolpos) —————→

(B) **Secondary amenorrhea** —————→

(Retroverted gravid uterus)

(C) **Menorrhagia** —————→

(Impacted uterine fibroid in the POD)

(D) **Irregular bleeding and pain** —————→

(Pelvic hematocele and pelvic abscess).

(E) **No menstrual abnormality** —————→

(Impacted ovarian tumor and cervical fibroid).

RETENTION OF URINE

4. VAGINAL SPECULUM

Q. *What are the types of vaginal specula used in gynecology?*

- Ans.** (i) Cusco's self-retaining vaginal speculum
(ii) Sim's posteriorvaginal speculum.
(iii) Auvard's self-retaining posterior vaginal speculum.
(iv) Huffman-Graves self-retaining speculum .

Q. *What is Huffman-Graves speculum and where it is used (Fig. 14.7)?*

- Ans.** Huffman-Graves speculum is also a self-retaining speculum. Blades are narrow and long. It is designed for the adolescents in whom the introitus is narrow. It helps in easy inspection of the cervix in adolescents. It is also known as Duckbill speculum.

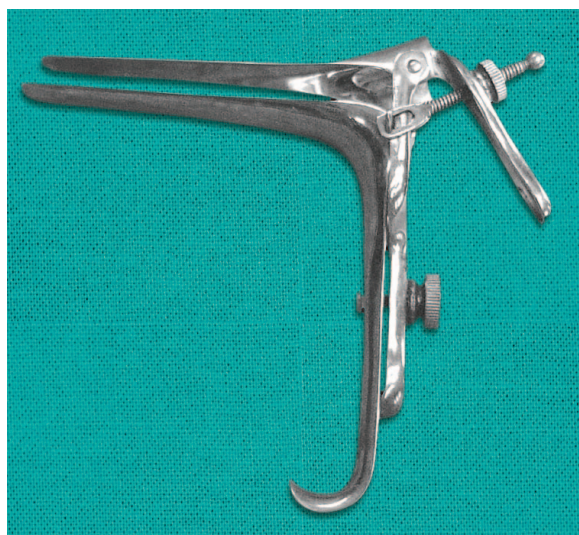


Fig. 14.7: Huffman-Graves speculum

Q. *What are the advantages of Cusco's speculum (Fig. 14.8)?*

- Ans.** (i) It is self-retaining—so no assistant is required to hold the speculum as in Sims' posterior vaginal speculum.

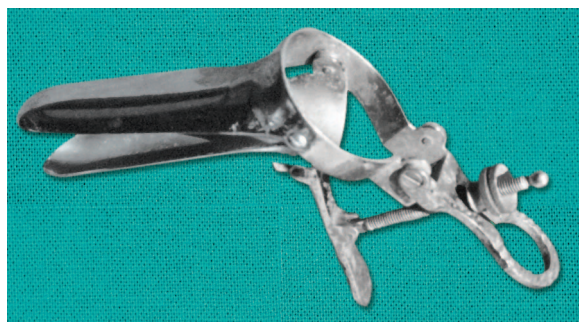


Fig. 14.8: Cusco's speculum

- (ii) It makes complete visualisation of the cervix. In Sims' speculum the anterior vaginal wall is to be pushed up with an anterior vaginal wall retractor.

(iii) **Procedures** like cervical smear, colposcopy, cervical biopsy and swabs can be performed simultaneously.

Q. How is it introduced?

Ans. The patient is brought to the edge of the table. The speculum is introduced with blades closed and keeping the blades parallel to the vaginal introitus. The gloved left hand fingers (thumb and the index) are used to keep the labia apart. The speculum, smeared with a lubricant, is introduced gently. Once inside the vagina, it is rotated at right angle keeping handle downwards. The blades are now opened up and the screw is tightened.

Q. What are the disadvantages of using this speculum?

Ans. The anterior and the posterior walls of the vagina can not be seen as they are covered up by the blades.

Q. How can you get the benefit of using Cusco's speculum while using the Sims posterior vaginal speculum?

Ans. Anterior vaginal wall is to be pushed up using an anterior vaginal wall retractor when Sims' speculum is used. Hence, one assistant is needed.

Q. What is cervical ectopy?

Ans. It is the replacement of squamous epithelium of the ectocervix by columnar epithelium of endocervix by the process of metaplasia.

Q. What is a polyp? What are the different types?

Ans. Polyp is a protruding tissue growth from mucous membrane (Fig. 14.9). It may be attached by a pedicle (pedunculated) otherwise it may be sessile. It may be benign (mucus, fibroid or placental) or malignant.



Fig. 14.9: A large cervical polyp with a pedicle seen to arise from the endocervix.

5. SHARMAN'S CURETTE (Fig. 14.10)

Q. *What are the advantages of this curette over the sharp and blunt curette?*

Ans. It is thin and narrow. There is no need of dilatation of the cervical canal. It can be introduced after the introduction of the uterine sound. It causes minimal trauma. Adequate tissue is obtained for endometrial histology.

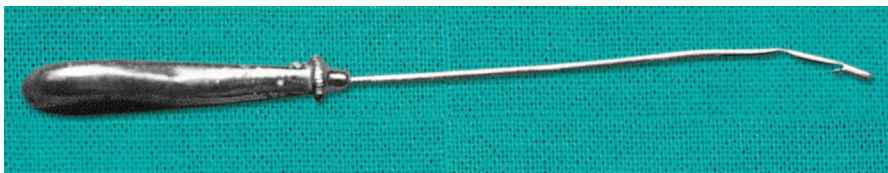


Fig. 14.10: Sharman's curette

Q. *What is the purpose of doing endometrial biopsy in a woman with infertility?*

Ans. To detect evidence of ovulation — by seeing the secretory changes in the endometrium.

Q. *On which day of the menstrual cycle is endometrial biopsy usually done?*

Ans. Biopsy should be done on 21–23rd day when the cycle is regular. When the cycles are irregular, it is done within 24 hours of menstruation.

Q. *In the endometrial biopsy, what is the earliest evidence of ovulation?*

Ans. Subnuclear vacuolation is the earliest evidence appearing within 36–48 hours of ovulation.

Q. *What are other methods of diagnosis of ovulation ?*

Ans. Basal body temperature (BBT), cervical mucus study, vaginal cytology, estimation of serum progesterone, LH and estradiol, sonography and laparoscopy.

Q. *What are the ovarian causes of infertility?*

Ans. Anovulation, Luteal phase defect (LPD) and Luteinised unruptured follicle (LUF).

6. CHORIOCARCINOMA

Q. *What are the common sites of metastasis?*

- Ans.** a) Lungs (80%)
b) Anterior vaginal wall (30%)
c) Brain (10%)
d) Liver (10%).

Q. *What are the important parameters in WHO scoring system of GTD?*

- Ans.** The important parameters in WHO scoring system are : Age, antecedent pregnancy, interval, pretreatment hCG, largest tumor size (cm), site of metastasis, number of metastasis and previous chemotherapy.

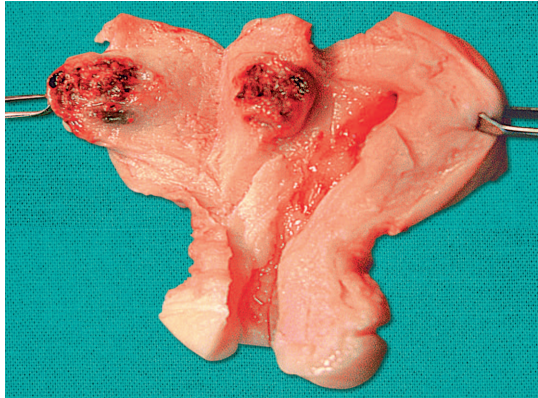


Fig. 14.11: Hemorrhagic growth within the myometrium—in a case of choriocarcinoma of the uterus

Q. *How do you score the risk factors?*

- Ans.** According to WHO (modified by FIGO) scoring system:
Score < 6 = Low risk. Total score ≥ 7 = High risk.

Q. *What is the significance of scoring?*

- Ans.** Single agent chemotherapy is usually given for low-risk women. Women with high-risk need multimodal therapy (surgery and radiation therapy). Multiple agent chemotherapy are used for women with high-risk disease (score ≥ 7), (see p 383). Radiation (brain and liver) therapy may have to be given.

7. FIBROID UTERUS

Q. Describe the specimen shown in figure 14.12.

Ans. **Fig. 14.12:** It is a specimen of a uterus with the cervix, ovaries and tubes of both the sides. The uterus is enlarged in size and irregular in shape due to multiple fibroids of different sizes. One of the fibroids is huge in size. It has invaded within the leaves of the broad ligament (pseudobroad ligament fibroid — see p 317). So it is a specimen of multiple fibroid uterus.

Q. What is the operation done here ?

Ans. Total abdominal hysterectomy and bilateral salpingo-oophorectomy.

Q. What could be the possible clinical presentation for this women ?

Ans. Menorrhagia, metrorrhagia, dysmenorrhea, pain abdomen, abdominal lump and pressure symptoms.

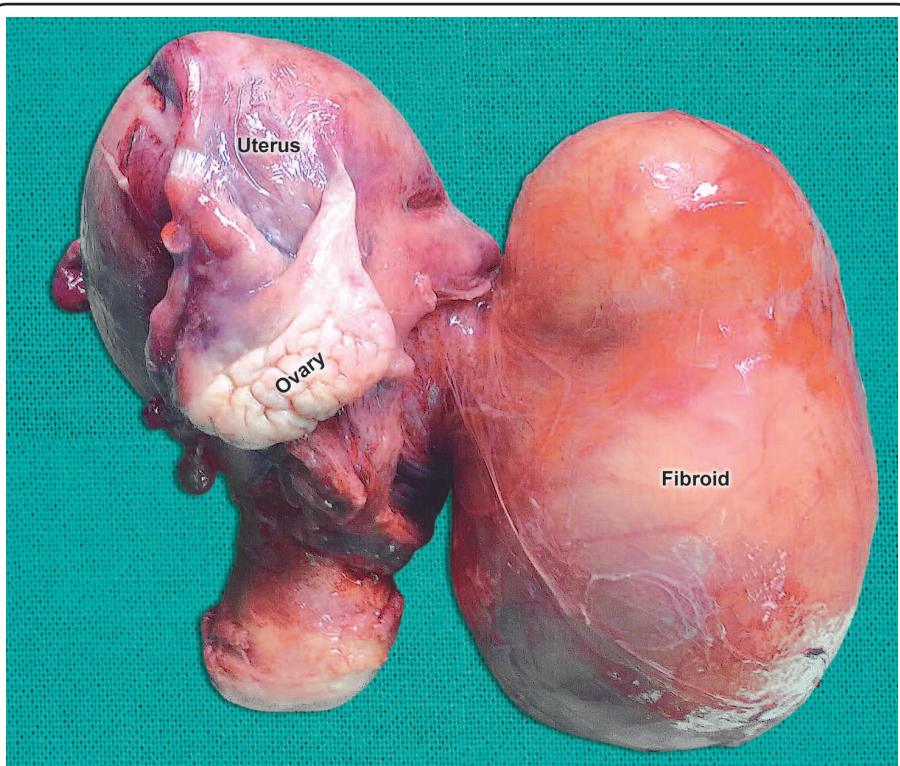


Fig. 14.12: Multiple fibroid (pseudo broad ligament fibroid) uterus. Majority are subserous in variety. This huge size fibroid invaded the broad ligament. Total hysterectomy with bilateral salpingo-oophorectomy done

Q. Describe the specimen shown in figure 14.13.

Ans. It is the specimen of uterus, cervix, tubes and ovaries of both the sides. The uterus is cut open to show a big interstitial myoma in the region of the fundus. There is a submucous myoma at the fundus also. There are also few small seedling myomas. The tubes, ovaries and the cervix are apparently normal. So it is a specimen of fibroid uterus.

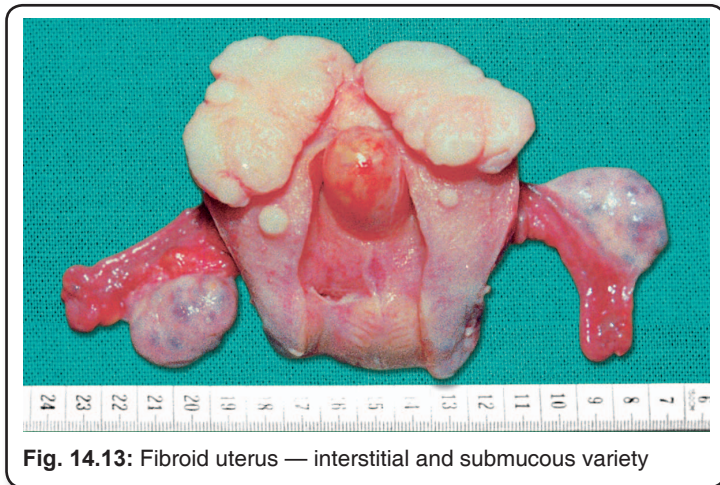


Fig. 14.13: Fibroid uterus — interstitial and submucous variety

Q. What operation has been done in this case ?

Ans. Total abdominal hysterectomy with bilateral salpingo-oophorectomy.

Q. What could be the presenting symptoms of this woman ?

Ans. Commonly such women present with: Menorrhagia, metrorrhagia, Dysmenorrhea, abdominal swelling or pelvic heaviness.

N.B. With this specimen of hysterectomy (Fig. 14.12 and 13) the women are unlikely to suffer from infertility. Her probable age would be 40 years, or above as bilateral oophorectomy had been done.

Q. What are the indications, conditions to be fulfilled, and contraindications of myomectomy ?

Ans. see p 438

Q. How do you differentiate fibroid uterus from adenomyosis ?

Ans.

- ♦ Adenomyosis is commonly seen in elderly women (>40 years)
- ♦ Uterus is enlarged diffusely due to myohyperplasia
- ♦ On TVS: There are cystic spaces seen in the myometrium
- ♦ MRI is diagnostic: Absence of endometrial- myometrial junctional zone
- ♦ On cut section: Capsule is absent (present in a fibroid uterus).

8. TUMORS OF THE OVARY (Fig. 14.14)

Q. *What are the common tumors of the ovary?*

Ans. Common tumors of the ovary are as follows:

A. Epithelial ovarian tumors (60–70%)

- ♦ Serous cystadenoma
- ♦ Mucinous cystadenoma
- ♦ Endometrioid tumor

B. Germ cell tumors (20–25%)

- ♦ Dysgerminoma
- ♦ Mature teratoma (dermoid cyst)
- ♦ Endodermal sinus cell tumor
- ♦ Choriocarcinoma
- ♦ Immature teratoma.

C. Sex cord stromal tumors (6–10%)

- ♦ Granulosa cell tumors
- ♦ Theca cell tumors



Fig. 14.14: Bilateral malignant epithelial tumors of the ovary. Specimen shows solid nodular masses with areas of hemorrhage and necrosis

- ♦ Sertoli-Leydig cell tumors
- ♦ Fibroma.

D. Other unclassified tumors

E. Secondary metastatic tumor (Krukenberg tumor)

Q. What are the common malignant tumors of the ovary?

Ans. A. Epithelial ovarian tumors often undergo malignant changes

- ♦ Serous cyst adenocarcinoma
- ♦ Mucinous cyst adenocarcinoma
- ♦ Malignant endometrioid (rare).

B. Germ cells tumors as mentioned above are malignant. Dermoid cyst is mostly benign. Risk of malignancy in a dermoid is very low (1–2%).

C. Sex cord stromal tumors may be benign but they are potentially malignant.

Q. Mention some of the clinical features of a malignant ovarian tumor.

Ans. Malignant ovarian tumors may remain asymptomatic.

Common symptoms are: Abdominal distension and discomfort, dyspepsia, loss of appetite, dull aching lower abdominal pain, weight loss and respiratory distress due to ascites or pleural effusion.

Important signs are: Cachexia, anemia, edema legs, jaundice.

Abdominal examination: A mass in the hypogastrium with features of malignancy.

Per vaginal examination: Nodules in the POD.

Q. What are the high risk as well as the protective factors for ovarian malignancy?

Ans. High-risk factors for ovarian malignancy

- a) Age: 40–60 years
- b) Familial cancers: Breast, endometrial and ovarian
- c) Postmenopausal palpable ovary (volume > 8 cc)
- d) H/o infertility.

Protective factors for ovarian malignancy are:

- a) Combined oral contraceptives
- b) Pregnancy
- c) Tubal ligation
- d) Salpingectomy
- e) Breastfeeding.

Q. What are the principles (guidelines) of surgical approach in a malignant ovarian tumor?

Ans. Surgery is the keystone in the management of ovarian cancers.

Practical guidelines for surgery are:

1. Incision-vertical.
2. To collect ascitic fluid for cytology.
3. A systematic exploration of the pelvic and abdominal cavity to detect metastasis and enlarged lymph nodes.
4. Biopsy from any metastatic deposit or from the peritoneum when no metastasis is observed.
5. Risk of malignancy index (RMI): $RMI \geq 250$, the risk of cancer is 75% (see below).

Q. What is the place of prophylactic oophorectomy during hysterectomy?

Ans. Prophylactic oophorectomy during hysterectomy may be considered in women who are at high risk for ovarian malignancy

Q. What is the surgical treatment of malignant ovarian tumor?

Ans. A. Early stage disease (stage Ia, G1, G2)

- ♦ Young woman → unilateral oophorectomy (fertility conserving surgery) → routine follow up → once family completed → removal of uterus and other ovary.
- ♦ Elderly woman—Hysterectomy and bilateral salpingo-oophorectomy
- ♦ In stage Ia, G3 and rest of stage I – Hysterectomy, bilateral salpingo-oophorectomy, omentectomy and chemotherapy.

B. Advanced stage disease

- a) Cytoreductive surgery or debulking procedure
- b) Adjuvant chemotherapy.

Q. What are screening methods for ovarian malignancy?

Ans. Clinical, biochemical (tumor markers) and biophysical (sonography including color Doppler) methods are commonly used.

- Clinical Examination: Neither sensitive nor specific
- Tumor markers; Raised CA 125, M-CSF- nonspecific
- USG, Doppler study – increased vascularity
- RMI (Risk of malignancy index): U (Ultrasonographic features) \times M (Menopausal status) \times $CA\ 125$ (measured in units) = RMI

If $RMI \geq 250$: Risk of malignancy is 75%.

Q. *How can a benign ovarian tumor can be differentiated from a malignant one clinically ?*

Ans. Benign ovarian tumor has the following clinical features: It is usually:

- a) Unilateral b) Mobile c) Cystic feel
- d) Smooth surface e) No ascites f) Slow growing

Q. *How can laparotomy findings be helpful to differentiate a benign tumor from a malignant one ?*

Ans. A malignant ovarian can be differentiated from a benign one on laparotomy by the following features:

- a) **Ascites** – Present and often it is hemorrhagic.
- b) **Tumor growth** is present on the surface.
- c) **Cut section** of the tumor shows solid and hemorrhagic areas.
- d) **Adhesions** and peritoneal nodules are present.
- e) **Metastatic** deposits may be present on liver surface para-aortic nodes may be palpable.

Q. *What are psammoma bodies ?*

Ans. These are tiny, calcified bodies observed in cases with serous cyst adenoma of the ovary. It found in areas of cellular degeneration.

Q. *What are the complications of a benign ovarian tumor ?*

Ans. (a) Torsion, (b) intracystic hemorrhage, (c) infection, (d) rupture, (e) pseudomyxoma peritonei and (f) malignancy.

Q. *Discuss the differential diagnosis of a pelvic abdominal lump.*

Ans. a) Full bladder
b) Pregnancy
c) Fibroid uterus
d) Chocolate cyst of the ovary
e) Encysted tuberculosis
f) Ascites.

Q. *Mention the features of functional ovarian cysts.*

Ans. The important feature of the functional cysts of the ovary are:

- a) It is due to temporary hormonal disorders
- b) Usually 6–8 cm in diameter
- c) Usually asymptomatic
- d) Unilocular
- e) Regresses spontaneously
- f) Contains clear fluid.

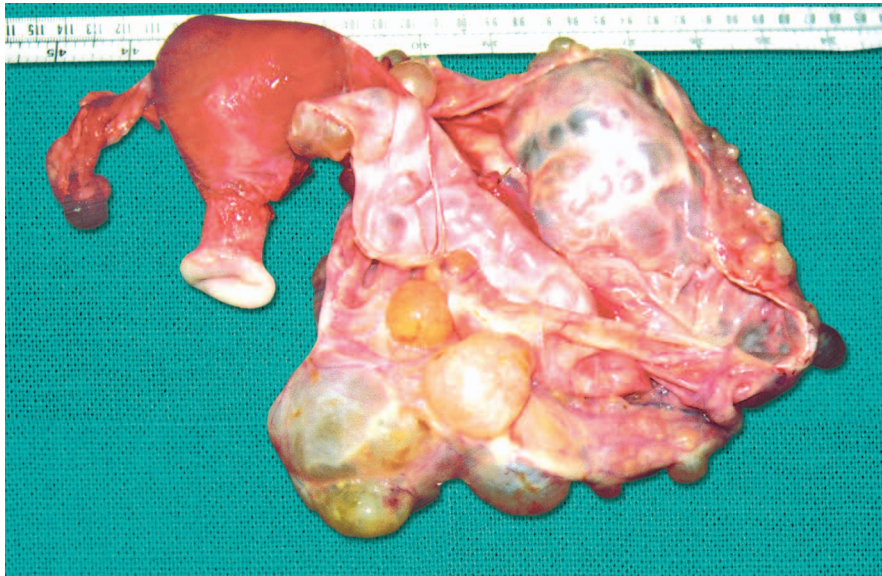


Fig. 14.15: Serous cystadenoma (gross appearance on cut specimen)

Q. Outline the management of a benign ovarian tumor

Ans. Laparotomy: Incision → vertical — exploration of pelvic organs and the abdominal cavity:

Benign

- (i) Young woman — ovarian cystectomy or ovariectomy,
- (ii) Parous women 40 years or above. Total hysterectomy with bilateral salpingo-oophorectomy.

Q. What are the common malignant ovarian tumors?

Ans. A. Epithelial cell carcinomas (Fig. 14.15)

- a) Serous cyst adenocarcinoma
- b) Mucinous cyst adenocarcinoma.

B. Germ cell carcinomas

- c) Dysgerminoma
- d) Endodermal sinus tumor

Q. What adjuvant chemotherapy is commonly used in the management of carcinoma ovary following surgery?

Ans. Adjuvant chemotherapy with carboplatin and paclitaxel for six cycles is used.

Q. Mention the difficulties in the management of ovarian cancers.

Ans. Diagnosis is often late as many patients remain asymptomatic for a long time. Unlike cervix, there is no effective screening procedure. There is no premalignant stage for ovarian cancer. Ovarian neoplasm — discussion continued on p 384.

9. PELVIC INFECTION (see Fig. 14.16)

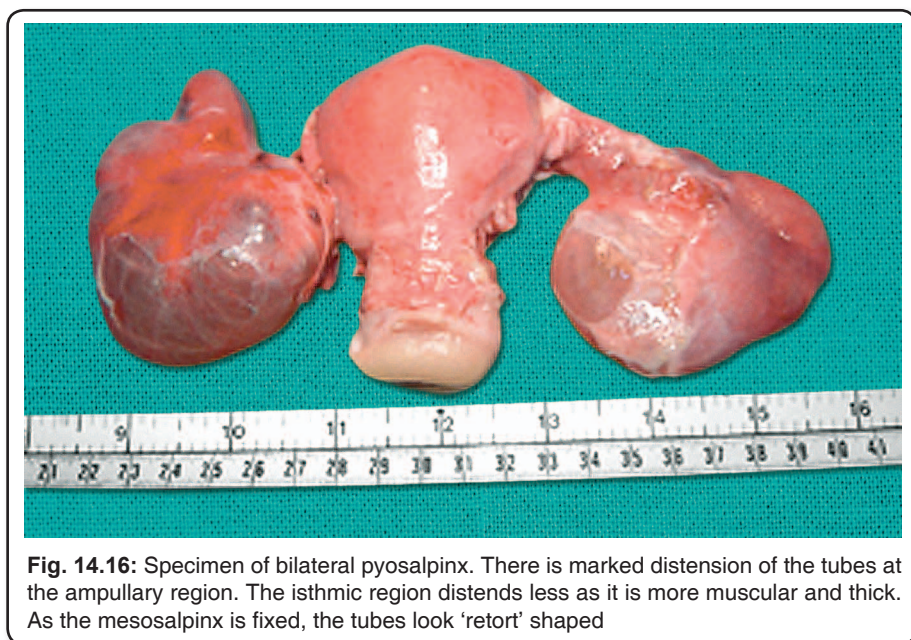


Fig. 14.16: Specimen of bilateral pyosalpinx. There is marked distension of the tubes at the ampullary region. The isthmic region distends less as it is more muscular and thick. As the mesosalpinx is fixed, the tubes look 'retort' shaped

Q. How infertility and menstrual abnormalities could be explained with genital tuberculosis ?

Ans. Discussed on p 348 and 349

Q. What organs are commonly affected with chlamydial infection and how the infection is treated ?

Ans. ■ Chlamydial infection affect the columnar and transitional epithelium of the genitourinary tract.

- Urethritis, bartholinitis, cervitis, endometritis and salpingitis are common.
- Recommended drugs for chlamydial infection are azithromycin 1 gm, PO. Single dose or doxycycline 100 mg, PO. BID for 7 days.
- Husband should also be treated simultaneously.

Q. What are the clinical features of bacterial vaginosis ? How can the infection be diagnosed and how is it treated ?

Ans. A. Clinical features:

- a) Smelly vaginal discharge
- b) Discharge greyish-white in color

B. Diagnosis.

- a) **Whiff test:** Fishy (amine) odor when a drop of discharge: is mixed with 10% solution of KOH.

b) **Clue cells:** Vaginal epithelial cells appear granular when seen under a microscope.

C. Treatment: Metronidazole 200 mg orally thrice daily for 7 days is effective. Husband (sexual partner) should also be treated simultaneously.

Q. What is HIV? What is the immunopathogenesis of this infection? What is the current recommendation for the treatment of HIV?

Ans. Human immunodeficiency virus (HIV) is a retrovirus having the enzyme reverse transcriptase. There is progressive depletion of CD4⁺ cells. This results in immunodeficiency of the infected person. AIDS is considered when the count of CD4⁺ are <200 cells/mm³.

Current recommendation for treatment for highly active antiretroviral therapy (HAART) are:

- ♦ Two drugs from nucleoside reverse transcriptase inhibitors (NRTI) plus one drug from non-nucleoside reverse transcriptase inhibitors (NNRTI).

Q. What is hydrosalpinx and how is it formed?

Ans. It is the collection of watery secretion within the fallopian tube. It is the end result of mild endosalpingitis by pyogenic infection. Pyogenic infection → endosalpingitis → inflammation of the fimbriae → adhesion formation → closure of abdominal ostium. The secretion (pus) is pent up → distension of the tube → markedly at the ampulla (muscular isthmus is rigid and there is minimal distension).

The distended tube is curled (as the mesosalpinx is fixed) and takes 'retort' shaped (Fig. 11.17). The pus (pyosalpinx) is gradually liquefied and settles down with clear fluid above (hydrosalpinx).

As the uterine ostium is not closed anatomically, there may be repeated infections. There is also intermittent passage of fluid into the uterine cavity and vagina. This is known as **intermittent hydrosalpinx or hydrops tubal profluens**.

Q. What are the different causes of pelvic abscess?

Ans. a) Postabortal, puerperal sepsis
b) Acute salpingitis
c) Perforation of an infected uterus
d) Irritant peritonitis (following HSG).

Q. What are the different types of surgery for the management of a case with pelvic abscess?

Ans. To start systemic antibiotics to cover both aerobic and anaerobic micro-organisms.

Abscess is to be drained thereafter by:

- A. Posterior colpotomy
- B. Laparotomy.

Pus should be sent from culture and antibiotic sensitivity.

Q. *How do you diagnose genital tuberculosis ?*

Ans. ■ Clinical presentation is similar to any other patient with tuberculosis.

- Important gynecological symptoms are:
 - ♦ Weakness, low grade fever, anemia
 - ♦ Infertility (tubal blockage)
 - ♦ Menstrual abnormality (amenorrhea, dysmenorrhea)
 - ♦ Chronic pelvic pain
- On examination
 - ♦ Ascites may be present
 - ♦ Per vaginam-adnexal mass may be felt
- Investigations
 - ♦ General investigation: Complete hemogram, Montoux test, X-ray chest
 - ♦ Diagnostic uterine curettage:
 - Endometrium is tested for
 - (a) Histopathological examination
 - (b) Culture in Löwenstein-Jensen media
 - (c) AFB-microscopy (Ziehl-Neelsen's stain)
 - (d) PCR-for nucleic acid (DNA) amplification
 - ♦ Hysterosalpingography
 - ♦ Laparoscopic biopsy and/or aspiration of fluid for AFB culture

Q. *What are the features of the tube on HSG when affected with tuberculosis?*

Ans. The following features on HSG are suggestive of tuberculosis. However, in a proved case of tuberculosis, HSG is contraindicated.

- ♦ Vascular or lymphatic extravasation of dye.
- ♦ Rigid (lead-pipe) tubes with nodulations at places.
- ♦ 'Tobacco pouch' appearance with blocked fimbrial end.
- ♦ Beaded appearance of the tube with variable filling density.
- ♦ Distal tube obstruction.
- ♦ Coiling of the tubes or calcified shadow at places.
- ♦ Bilateral cornual block.

- ♦ Tubal diverticula and/or fluffiness of tubal outline.
- ♦ Uterine cavity — irregular outline, honeycomb appearance or presence of uterine synechiae.

Q. *What are the indications of surgery in a woman with pelvic tuberculosis?*

- Ans.**
- a) Patient not responding to antitubercular therapy
 - b) Formation of tubercular pyosalpinx, abscess or pyometra
 - c) Persistent chronic pelvic pain.

Q. *What is the result of treatment in terms of reproduction in a woman with genital tuberculosis ?*

- Ans.** The prognosis is mostly unfavorable. Pregnancy is rare (5–10 %). Abortion and ectopic pregnancy are common.

1. **Dilatation and Curettage**
2. **Dilatation of Cervix**
3. **Dilatation and Insufflation**
4. **Hysterosalpingography**
5. **Cervical Biopsy**
6. **Thermal Cauterization of the Cervix**
7. **Marsupialization of a Bartholin's Cyst**
8. **Female Sterilisation**
9. **Amputation of Cervix**
10. **Fothergill's Operation**
11. **Operations on the Ovary**
12. **Abdominal Hysterectomy**
13. **Myomectomy**

Chapter Objectives**Operative Gynecology:**

Core knowledge and understanding with:

- Surgical anatomy of abdomen and pelvis and pelvic floor muscles
- Outlines of common surgical procedures
- Case selection (indications of surgery) based on pathology
- Advances in gynecologic surgery including Laparoscopy, Hysteroscopy, Robotics
- Principles of homeostasis and hemostasis
- Post-operative care
- Surgical complications
- Follow up procedures

Gynecologic Oncology:

- **Basic knowledge of:** Principles of surgery, chemotherapy, radiotherapy and follow up

- 14. Vaginal Hysterectomy**
- 15. Anterior Colporrhaphy**
- 16. Colpoperineorrhaphy**
- 17. Large Loop Excision of the Transformation Zone (LLETZ)**
- 18. Radical Hysterectomy**
- 19. Endoscopic Surgery in Gynecology**
- 20. Robotics in Gynecology**

1. DILATATION AND CURETTAGE

Indications

(A)Diagnostic: (i) Infertility, (ii) DUB, (iii) endometrial tuberculosis, (iii) endometrial carcinoma and (v) postmenopausal bleeding.

(B)Therapeutic: (i) DUB, (ii) endometrial polyp and (iii) removal of IUCD.

Instrument Trolley for Dilatation and Curettage Operation

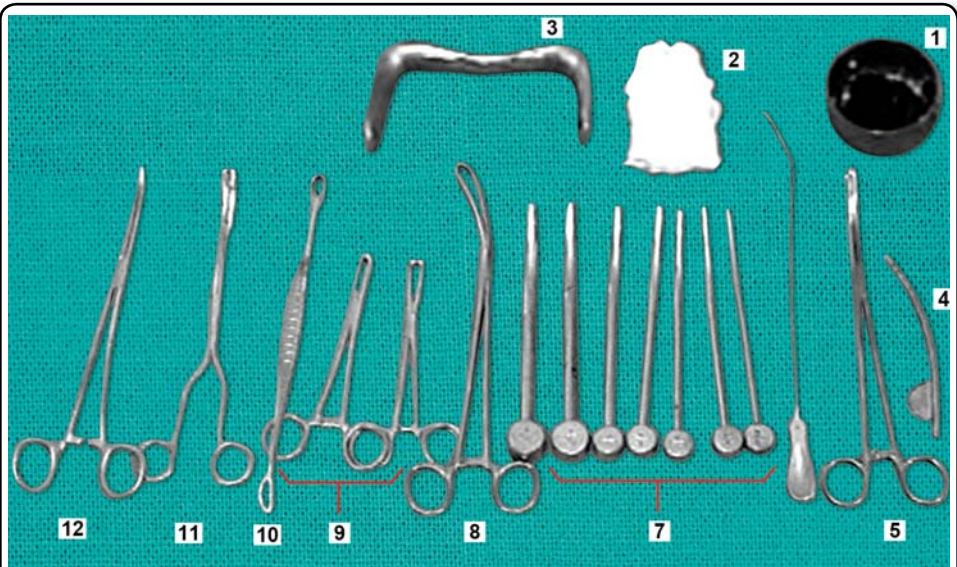


Fig. 15.1: (1) Bowl with antiseptic lotion (Povidine iodine), (2) gauze pieces, (3) sim's posterior vaginal speculum, (4) female metal catheter, (5) sponge holding forceps, (6) uterine sound, (7) Hawkin-Ambler dilators (different sizes), (8) vulsellum, (9) Allis tissue forceps, (10) Sharp and blunt curette, (11) Ovum forceps and (12) Uterine dressing forceps

Steps of operation

Principal steps are mentioned here. (*For details— see CD incorporated*).

1. The woman is to empty her bladder (before coming to the OT).
2. General anesthesia or sedation is used.
3. Lithotomy position.
4. Antiseptic cleaning and draping.
5. Bimanual examination is done.
6. Posterior vaginal speculum (Sim's) is introduced (Fig. 15.2).
7. Anterior lip of the cervix is held with an Allis tissue forceps (Fig. 15.2).
8. A uterine sound is introduced to confirm the position and the length of the uterine cavity.
9. Cervical canal is dilated with graduated dilators (Hegar's or Hawkin-Ambler's) (Fig. 15.3).
10. After the desired dilatation, the uterine cavity is curetted by a uterine curette.

Thorough but gentle curettage is usually done (Fig. 15.4).

11. At the end, Allis tissue forceps and the speculum are removed (Fig. 15.5).
12. The curetted material is preserved in 10% formol saline or normal saline (in case of tuberculosis) and sent for histopathological examination (Fig. 15.6).

Complications

Immediate: (i) Injury to the cervix, (ii) uterine perforation, (iii) infection, (iv) injury to the gut (following perforation) and (v) hemorrhage.

Remote: (i) Cervical incompetence (ii) uterine synechiae

Important Figures of Dilatation and Curettage

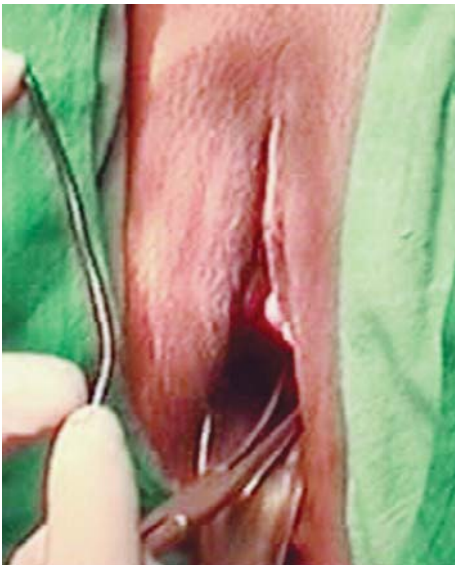


Fig. 15.2: Antiseptic cleaning and drapings; catheterization, bimanual examination — all done. Sim's posterior vaginal speculum is applied. Anterior lip of the cervix is grasped with an Allis tissue forceps. Uterine sound is passed and the uterocervical canal length is measured (see fingers)



Fig. 15.3: Cervical canal is dilated with Hawkin-Ambler's dilator



Fig. 15.4: Endometrium is being curetted. The curette is seen



Fig. 15.5: End of the procedure. Cervix is seen without any bleeding



Fig. 15.6: Curetted endometrium is taken in a bottle dipped in formol saline. It is to be sent for histopathology examination

2. DILATATION OF CERVIX

- (a) Preliminaries : As mentioned in dilatation and curettage till point 7 on p 420.
- (b) Uterine sound is introduced to measure the uterocervical length. It acts as a first dilator.
- (c) Dilatation of the cervical canal is thereafter done gradually by using cervical dilators (graduated) (Figs 16.8A and B).

Indications

- (i) Prior to amputation of cervix (ii) prior to hysteroscopy, (iii) for drainage of pyometra or hematometra, (iv) prior introduction of uterine curette, insertion of IUCD, laminaria tent or radium and (v) spasmodic dysmenorrhea.

3. DILATATION AND INSUFFLATION (Rubin's test)

Q. What are the indications of this procedure ?

Ans. Indications: To note the patency of the fallopian tubes in (i) investigation of infertility, (ii) following tuboplasty operation.

Q. When is this test done?

Ans. It is usually done between the 8th and 12th day of the cycle.

Contraindications

- (i) Pelvic infection, (ii) vaginal bleeding and (iii) Pregnancy.

Steps

Not commonly done these days. This is due to the availability of better alternative methods. Major part of the procedure is similar to D and C. Media used for insufflation is air or CO₂ into the uterine cavity.

Complications

Immediate: (i) Similar to faced during D + C operation, (ii) air embolism, (iii) rupture of the tube and (iv) flaring up of the pre-existing pelvic infection.

Remote: Pelvic endometriosis.

4. HYSTEROSALPINGOGRAPHY (HSG)

Indications

- To note tubal patency in a case with infertility
- To detect uterine malformations
- To diagnose uterine synechiae
- Incidental diagnosis of uterine submucous fibroid or polyp or hydrosalpinx.

Steps

Important steps of the procedure:

- ◆ Steps 1 to 7 as discussed in Dilatation & Curettage operation are the same except that this procedure is done in the radiology department and without anaesthesia
- ◆ HSG cannula (Fig. 15.7), fitted with syringe containing the radio-opaque dye is pushed slowly inside the uterine cavity.
- ◆ Two radiographic images are generally taken
 - The first one to show the filling of the uterine cavity
 - The second one after 10 to 12 minutes to show the tubal findings.
- ◆ Tubal patency is diagnosed by peritoneal spillage.

Contraindications

(i) Presence of pelvic infection, (ii) pregnancy and (iii) vaginal bleeding.

Complications

(i) Peritoneal irritation and pelvic pain, (ii) vasovagal attack, (iii) intravasation of dye and (iv) flaring up of pelvic infection.



Fig. 15.7: Hysterosalpingography cannula (Leech Wilkinson variety)

5. CERVICAL BIOPSY

Types

- ◆ Surface ◆ Punch ◆ Wedge ◆ Ring ◆ Cone

Indications

(i) When the cervix appears suspicious clinically, (ii) when there is presence of any growth or ulcer on the cervix and (iii) surface biopsy (smear) is done as a routine.

Procedure for Individual Biopsy

A. Cone biopsy (conization)

Cone-shaped tissue of the cervix including the squamocolumnar junction is removed.

Indications

Diagnostic:

- Unsatisfactory colposcopic examination.
- Inconsistent findings — Colposcopy, cytology and directed biopsy.
- Endocervical curettage — Positive.
- When biopsy shows CIS or microinvasion to exclude invasive carcinoma.

Therapeutic:

- CIN
- CIS in a young woman
- Invasive carcinoma (< 1 mm stromal invasion)
- Carcinoma cervix stage Ia 1 (in exceptional cases where childbearing is desired and where the patient is strongly motivated for long-term follow up. Surgical margins must be free of disease).

Complications

- ◆ Secondary hemorrhage
- ◆ Cervical stenosis
- ◆ Cervical incompetence
- ◆ Infertility
- ◆ Diminished cervical mucus
- ◆ Midtrimester abortion (recurrent) or preterm labor



Fig. 15.8: Punch biopsy forceps

6. THERMAL CAUTERIZATION OF THE CERVIX

Indications

- ♦ Cervical ectopy (see p 404)
- ♦ CIN — Selected cases (to destroy tissues upto depth of 8–10 mm) (see p 343)

Procedures

- ♦ Generally the operation is done under general anesthesia.
 - Initial steps are the same as in D and C (see p 420).
 - Cervical canal is dilated by one or two small dilators.
 - The whole of the eroded area is cauterized by radial strokes of the cautery. The strokes are made at least 2 mm deep and at a distance of 1 cm.
 - The area is smeared with antibiotic ointment (metrogyl and povidone iodine or Trisulpha cream).

Q. How does the ectopy heal?

Ans. It takes 2–3 weeks for sloughing off the burnt area. Complete epithelialization by squamous epithelium occurs by 6–8 weeks.

Q. What advice is given to the patient on discharge?

There may be serosanguinous or even blood-stained discharge for 2–3 weeks till there is complete regrowth of epithelium. Rarely there may be secondary hemorrhage when she needs to be admitted and treated.

7. MARSUPIALIZATION OF A BARTHOLIN'S CYST

It is commonly done under general anesthesia.

Actual Steps

Lithotomy position, antiseptic cleaning of the vulva, vagina and drappings are done. An incision is made on the inner side of the labium minus just outside the hymenal ring. The cut margins are trimmed off to make an elliptical opening of about 1 cm in diameter. The pus is allowed to drain. The edges of the vaginal and the cyst walls are sutured by interrupted catgut stitches, thus leaving behind an opening for drainage.

Q. What are the advantages of marsupialization over the traditional incision and drainage?

Ans. (i) Simple procedure, (ii) can be done under local anaesthesia,



Fig. 15.9: Right sided Bartholin's cyst

(iii) shorter hospital stay (24 hours), (iv) postoperative complications are less, (v) gland function (lubricant) remains intact and (vi) risk of recurrence is minimal.

8. FEMALE STERILIZATION (TUBECTOMY)

This operation can be done either by — (a) Abdominal (common) or (b) vaginal route.

Abdominal route: It may be by — (a) Conventional - Laparotomy (b) minilaparotomy (Mini-Lap) procedure or (c) laparoscopic method (see p 465).

Time of operation : (1) **During puerperium.** (2) **Interval**—about 6–8 weeks following delivery or abortion. (3) **Concurrent** with MTP or cesarean section.

Steps of Operation

Anesthesia: General or spinal or local.

Site of skin incision: **In puerperal cases**— Two fingers breadth (1") below the fundus. **In interval cases** 2 fingers breadth above the symphysis pubis. The incision may be transverse or midline. It is usually $\frac{1}{2}$ " to 1" in length.

Delivery of the tube: The tube is hooked out with the index finger. The finger is passed along the posterior uterine surface then to the posterior leaf of the broad ligament to reach the tube. The tube is identified by the fimbrial end.

Technique: In Pomeroy's method, a loop of the tube [at the level of the isthmus (mainly) and part of the ampulla] is held by an Allis tissue forceps. Both the limbs of the tube are then tied firmly together using No. 'O' chromic catgut. About 1–1.5 cm of the segment of the loop distal to the ligature is excised. The same procedure is repeated on the other side. The excised segment of the tube should be inspected and may be sent for histology.

It is a safe and effective procedure.

Failure rate is 0.1–0.5%.

Important Figures of Female Sterilization (Tubectomy)

Fig. 15.10: Mini-Lap incision is made (1.5 to 2.5 cm)

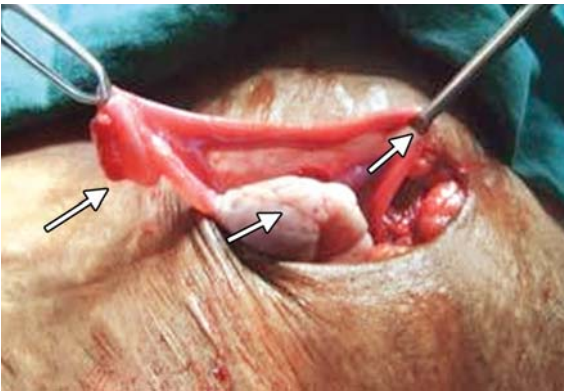


Fig. 15.11: Left tube is delivered through the incision margins. Fimbrial end is seen (arrow). Ovary is seen behind (arrow). The tube and the mesosalpinx are stretched out. A loop of the tube is made (arrow)



Fig. 15.12: The needle is passed through the avascular part of the mesosalpinx

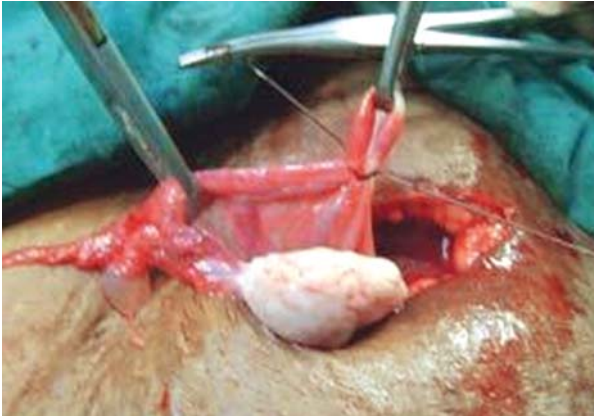


Fig. 15.13: Both the limbs of the loop are tied firmly together with chromic catgut. About 2 cm of the loop segment is seen distal to the ligature

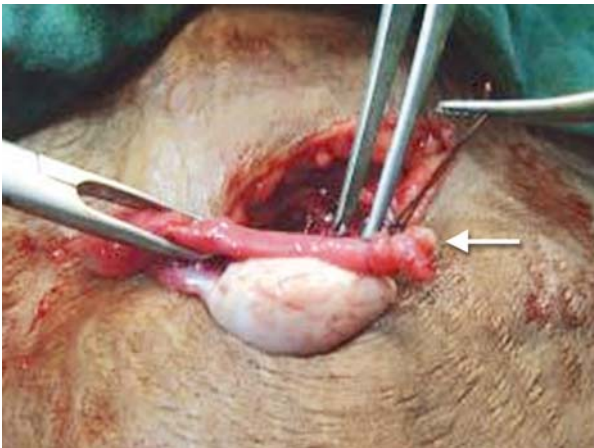


Fig. 15.14: About 1.5 cm of the loop distal to the ligature is excised (arrow)



Fig. 15.15: The stump of the tubal ends (arrow) are inspected to ensure that the tube is cut completely and there is no bleeding

9. AMPUTATION OF CERVIX

Indications

- ♦ Congenital elongation of cervix.
- ♦ As a component of Fothergill's operation (see below)
- ♦ Chronic hypertrophy and elongation of cervix.

Principal steps

see Dutta Gyne 6/e, p 592.

Complications

Immediate: ■ Hemorrhage — Both primary and secondary.

■ Sepsis.

Remote:

■ Cervical stenosis leading to hematometra.

■ Cervical incompetency leading to midtrimester (recurrent) miscarriage.

■ During labor — Secondary cervical dystocia.

10. FOTHERGILL'S OPERATION

Q. What are the composite steps of Fothergill's operation?

- Ans.** 1. Preliminary dilatation and curettage
 2. Amputation of cervix
 3. Plication of Mackenrodt's ligament in front of the cervix
 4. Anterior colporrhaphy
 5. Colpoperineorrhaphy.

Q. What is Sturmdorff suture ?

Ans. see Dutta Gyne 6/e, p 217.

Q. What is Fothergill's stitch ?

Ans. This stitch passes through the following tissues in sequence. Vaginal skin at the level of the Fothergill's lateral point → Mackenrodt's ligament → through the cervical tissue from outside inwards → cervical tissue from inside outwards → Mackenrodt's ligament of the other side → vaginal skin (Fothergill's lateral point) of the other side. This stitch is used to make the uterus anteverted.

Q. What are the complications of Fothergill's operation ?

- Ans.** a) Hemorrhage primary and secondary b) Injury to the bladder and rectum
 c) Retention of urine and cystitis d) Cervical stenosis
 e) Infertility. f) Cervical incompetence

11. OPERATIONS ON THE OVARY

- A. Oophorectomy** — Removal of healthy ovarian tissue (unilateral or bilateral).
- B. Ovarian cystectomy** — Removal of the ovarian cyst (tumor) leaving behind the healthy ovarian tissue.
- C. Ovariectomy** — Removal of the tumor along with healthy ovarian tissue. This is better termed as oophorectomy.

Steps

(i) Laterally: Paired clamps are placed on the infundibulopelvic ligament. (ii) Medially: Paired clamps are placed by the side of the uterus containing the fallopian tube and the ovarian ligament. (iii) Pedicles are cut → in between the clamps → ovarian tumor is removed → clamps are replaced by transfixation sutures.

- D. Wedge resection of the ovary** — A wedge of ovarian tissue is removed. It was done in the past in PCOS cases.
- E. Laparoscopic ovarian drilling** — done by monopolar or bipolar cautery or by laser, done in PCOS cases.
- F. Ovarian biopsy** : Sometimes done for the problem of intersexuality.

12. ABDOMINAL HYSTERECTOMY

Types

- A. Total**: When the entire uterus (including the cervix) is removed.
- B. Subtotal**: Removal of the body or corpus leaving behind the cervix.
- C. Hysterectomy with bilateral salpingo-oophorectomy (Pan-hysterectomy).**
- D. Extended hysterectomy**: Type 'C' plus removal of the vaginal cuff.
- E. Radical hysterectomy**: Removal of uterus, tubes, ovaries of both the sides, upper one-third of vagina, adjacent parametrium and the draining pelvic lymph nodes.

Q. What are the common indications of abdominal hysterectomy ?

Ans. Common indications are:

1. Fibroid uterus
2. Abnormal uterine bleeding (AUB)
3. Endometriosis
4. Adenomyosis,
5. Carcinoma: a. Endometrium, b. Cervix, c. Ovary.
6. Obstetrics: Atonic PPH.

Steps of Abdominal Hysterectomy

Abdomen is opened either by a low transverse incision (common) or by a infraumbilical paramedian or midline incision. The uterus is pulled up either by using a vulsellum or by placing long artery forceps one on either side at the cornu of the uterus. Clamps are placed on one side first. Similar steps are repeated on the other side.

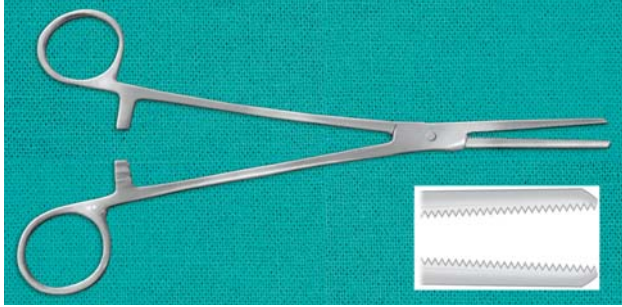


Fig. 15.16: Long straight hemostatic forceps (Spencer Wells)

Important Sites For Placing The Clamps

If the ovaries are to be preserved: The first pair of clamps (two long straight artery forceps) are placed at the cornu of the uterus to include — (a) Fallopian tube, (b) mesosalpinx containing utero-ovarian vessels and (c) ovarian ligament: structures are cut in between the clamps → replaced by transfixation sutures. Similar steps are done on the other side (Fig. 15.18).

When the ovaries are to be removed: (i) **First pair of clamps** are placed in the infundibulopelvic ligament. The tissues in between are cut and replaced by transfixation sutures (Vicryl-O or chromic catgut-I). Similar steps are done on the other side.

(ii) **Second pair of clamps** → on the round ligament → cut → replaced by transfixation sutures (Fig. 15.19).

The loose peritoneum of the uterovesical pouch is incised and the bladder is pushed down. This minimizes the injury to the bladder.

(iii) **Third pair of clamps** are placed on the parametrium containing ascending branch of uterine artery → cut → replaced by transfixation sutures (Fig. 15.23).

(iv) **Fourth pair of clamps** are placed on the uterosacral ligaments → cut → replaced by transfixation sutures.

(v) **Fifth pair of clamps** are placed on the Mackenrodt's ligament containing the descending cervical artery → cut → transfixation sutures (Fig. 15.24).

(vi) **The vault of the vagina** is opened → the cervix is transected from vagina entirely (Fig. 15.25).

(vii) **The lateral angles of the vagina** are closed by transfixation sutures and the vaginal vault is closed by interrupted sutures (Fig. 15.26). Pelvic peritonisation may be done.

(viii) Hemostasis is rechecked, counting done and satisfied, abdomen closed in layers.

Q. What are the important complications of total abdominal hysterectomy?

Ans. Complications are: (a) Immediate and (b) Remote

(a) **Immediate:**

- **During operation:**
 - Hemorrhage (primary)
 - Injury (bladder, ureter and bowel)
 - Anesthetic hazards

■ **Postoperative:**

- Hemorrhage (secondary) and shock.
- Urinary retention and cystitis
- Pyrexia and sepsis

(b) **Remote:** Vault granuloma, vault prolapse, incisional hernia.

| Advantages of vaginal over abdominal hysterectomy | Advantages of abdominal over vaginal hysterectomy |
|--|---|
| <ul style="list-style-type: none"> (i) Less postoperative pain and less need of analgesia (ii) No abdominal incision and scar (iii) Less post-operative morbidity and mortality (iv) Less hospital stay (v) Early resumption to work (vi) Convenient in obese patients | <ul style="list-style-type: none"> (i) Thorough exploration of the abdominopelvic organs can be done (ii) Tubo-ovarian pathology (TO mass) can be managed simultaneously (iii) Associated ovarian tumor or larger uterus (fibroid) are best managed abdominally (iv) Woman with associated pelvic adhesions or previous history of laparotomy are best managed by abdominal route (v) Indicated in cases where pelvic and abdominal (para aortic) lymph nodes are to be palpated and sampled |

Q. What are the common complications of abdominal wound?

Ans. Wound infection, discharge, wound dehiscence or burst abdomen.

Q. What are wound dehiscence and burst abdomen? How are they managed?

Ans. Wound dehiscence: When the separation of the layers of abdominal wound is upto the peritoneum — it is called as complete dehiscence.

If the intestines come out of the wound, it is called **evisceration or burst abdomen**. Burst abdomen usually occurs between seven to ten days of the operation.

Predisposing factors for burst abdomen are malnutrition, infection, cough due to chronic lung disease or abdominal distension.

Management: In the operation theater, under general anesthesia, necrotic tissues and clots are removed. The bowel is cleaned thoroughly with warm normal saline and placed back in the abdominal cavity. Through and through nylon (No. 2) sutures are passed 2 cm apart and about 3 cm from the skin margins to close the wound. Sutures are left in place for 3 weeks. Antibiotic (broad spectrum) is started and modified according to the culture and sensitivity report. Predisposing factors are to be taken care of.

Important Figures of Abdominal Hysterectomy



Fig. 15.17: Operation trolley for Abdominal Hysterectomy

Key: (1) Large towels for drapings (2) Skin retractors (Langenbach's and Czerney's retractors) (3) Myoma screw (4) Electro diathermy set (5) Haemostatic forceps (6) Towel clips (7) Kidney dish with large swabs (mops) (8) Gauze pieces (small) (9) Bowl containing povidone iodine (10) Empty bowl (11) Needle holders (straight and curved varieties) (12) Sponge holding forceps (13) Knives (two) (14) Scissors (tissue cutting and dissecting-4) (15) Dissecting forceps (plane & toothed / short & long varieties) (16) Haemostatic forceps (straight & curved varieties) (17) Allis tissue forceps (short) (18) Babcock tissue forceps (19) Clamps for hysterectomy (straight & curved varieties) (20) Allis tissue forceps (long) (21) Lens tissue forceps (22) Multiple toothed Vulsellum (2) (23) Langenbach's and Ezlery's retractors (different Sizes -3)

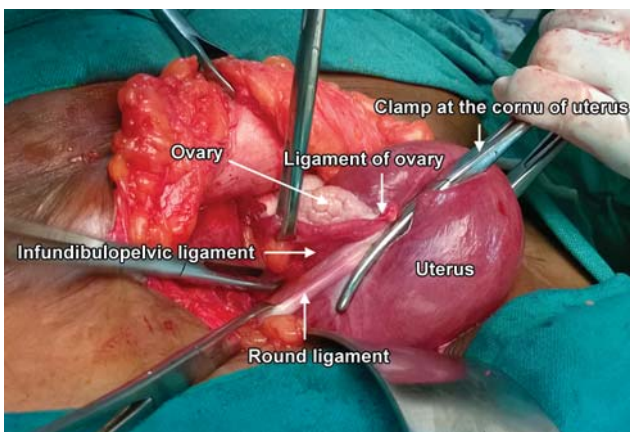


Fig. 15.18: Uterus is seen delivered through the abdominal incision. Clamp is placed at the cornu of the uterus. Structures held by the clamp, from anterior to posterior are: a) Round ligament; b) Fallopian tube; c) Ligament of the ovary.

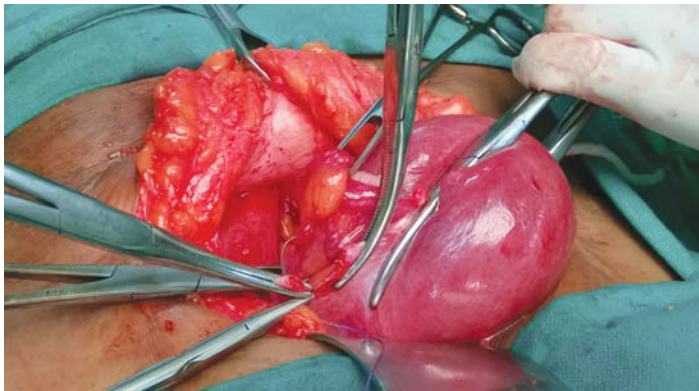


Fig. 15.19: The round ligament is clamped and cut in between the clamps. The clamp is replaced by the transfixation suture (Vicryl-0 or chromic catgut-1). Similar steps are done on the other side

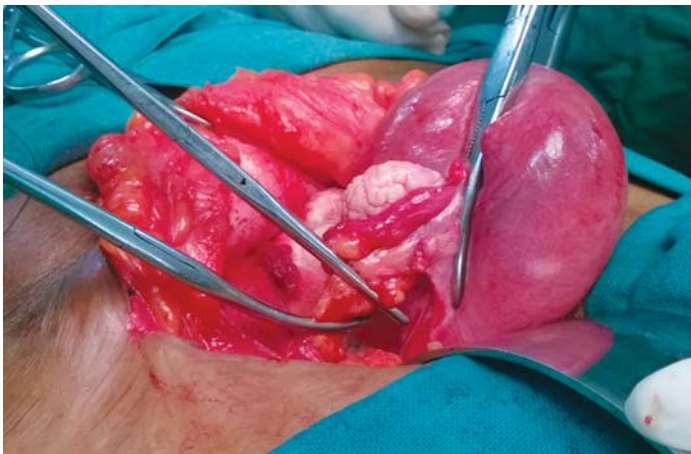


Fig. 15.20: The infundibulo-pelvic ligament is clamped. Two clamps are used.

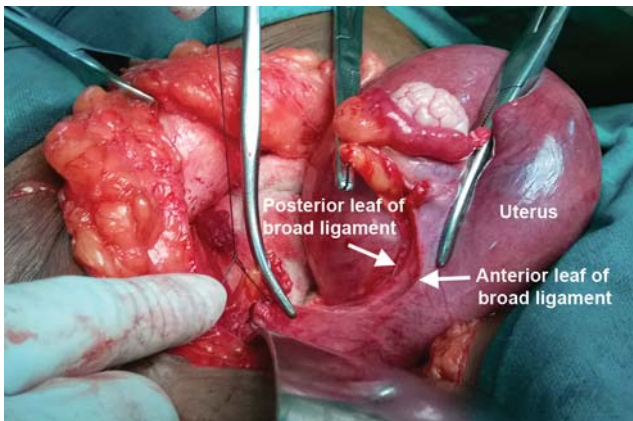


Fig. 15.21: The infundibulo-pelvic ligament is cut in between the clamps. The clamp is replaced by transfixation suture.(Vicryl-0 or chromic catgut-1). Similar steps are done on the other side. Anterior and Posterior leaves of the broad ligament are seen (see arrows)

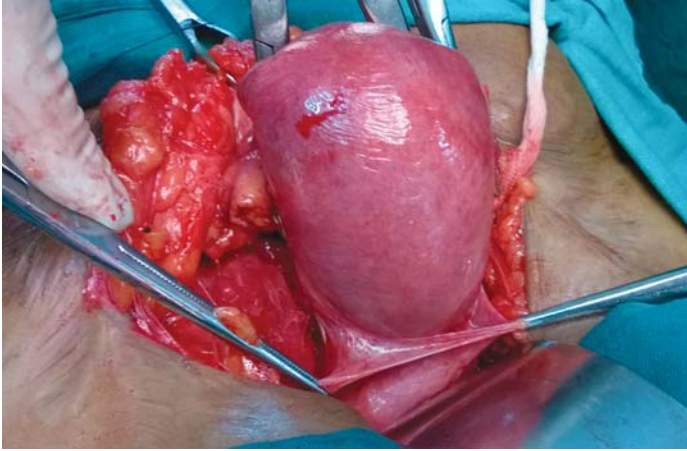


Fig. 15.22: The loose peritoneum of the uterovesical pouch is stressed out. This peritoneal fold is to be incised to push down the bladder. This reduces the bladder injury

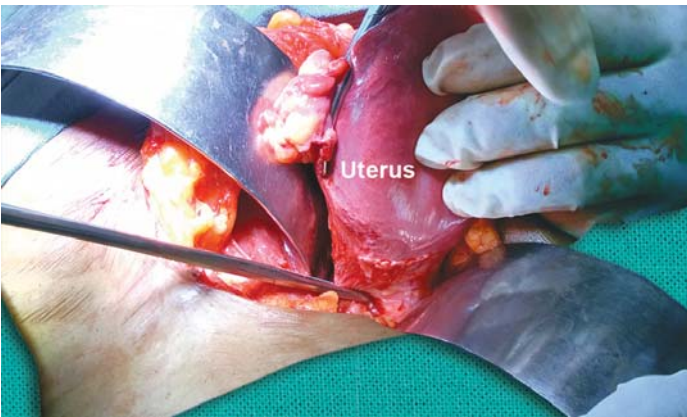


Fig. 15.23: Bladder is pushed down. Parametrium is dissected. Uterine artery is clamped. It is cut and trans-fixed.

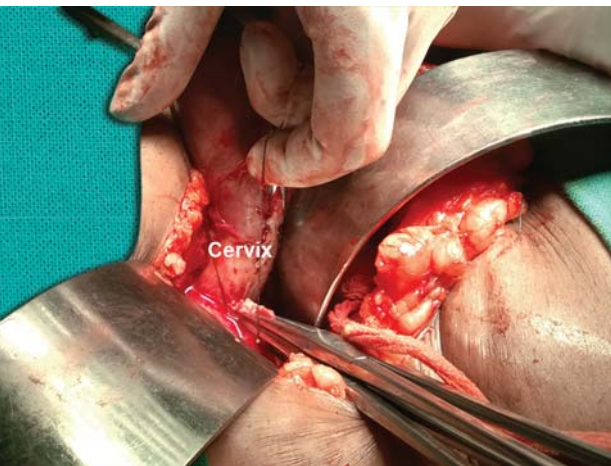


Fig. 15.24: Clamps are placed on the Mackenrodt's ligament, cut and transfixed

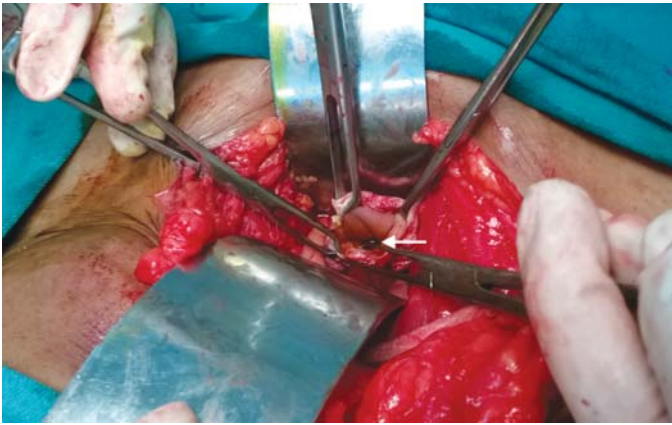


Fig. 15.25: Vault of the vagina is seen following transection of the cervix at the cervico-vaginal junction. Margins of the vaginal vault are held with Allis's tissue forceps.

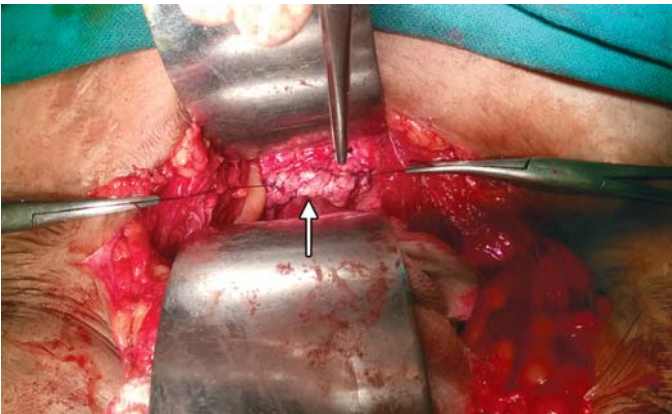


Fig. 15.26: Vaginal vault is closed from one angle to the other. Entire length of the vaginal vault is seen.

13. MYOMECTOMY

Q. What are the indications of myomectomy?

- Ans.** (a) Persistent uterine bleeding inspite of medical therapy
 (b) Excessive pain or pressure symptoms
 (c) Rapidly growing myoma
 (d) Infertility due to fibroid.

Q. Mention the contraindications of myomectomy?

- Ans.** (a) Infected fibroid
 (b) Suspected malignant change
 (c) Growth of myoma during menopause.

Q. What are the principal steps of myomectomy?

- Ans.** (i) A single incision is made (preferably) in the midline on the anterior wall. It is deepened through the myometrium and through the capsule till the myoma is reached.
 (ii) The myoma is grasped with a single toothed vulsellum and the myoma is enucleated from its bed by sharp and blunt dissection.
 (iii) The myoma bed (deep space) is obliterated by interrupted mattress or figure of eight sutures. Sometimes layers of sutures (tier stitch) may be required to approximate the myometrium.

Q. What are the complications of myomectomy?

- Ans. A. Immediate:** (a) Hemorrhage (b) Injury (bladder, ureter)
 (c) Others (anesthetic).

B. Remote :

- (a) Risk of recurrence of myoma (30–50%)
 (b) Persistence of menorrhagia (1–5%)
 (c) Risk of relaparotomy (20–25%)

Q. How can you control hemorrhage during myomectomy?

- Ans.** Measures to control blood loss during myomectomy are:
 (a) Preoperative treatment with GnRH analogue.
 (b) Use of vasoactive agents: Injection Vasopressin in the myometrium over the fibroids.
 (c) Use of tourniquets to occlude uterine vessels.
 (d) Use of Victor Bonney's clamp.

Q. *What are the long term results of myomectomy in respect of recurrence and others?*

- Ans.** (a) Recurrence of myoma (30–50%)
(b) Persistence of menorrhagia (1–5%)
(c) Risk of relaparotomy (20–25%).

Important Figures of Myomectomy



Fig. 15.27: Lateral view of a huge pelvic abdominal mass (fibroid uterus)



Fig. 15.28: The huge uterine mass (fibroid uterus) is delivered through the abdominal incision.

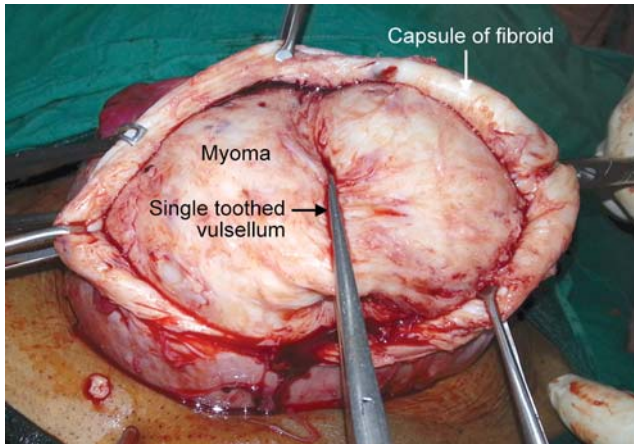


Fig. 15.29: A mid-line vertical incision is made. It is deepened to reach the myoma. The capsule of the fibroid is seen dissected out. Traction is given on the myoma with a single toothed vulsellum.

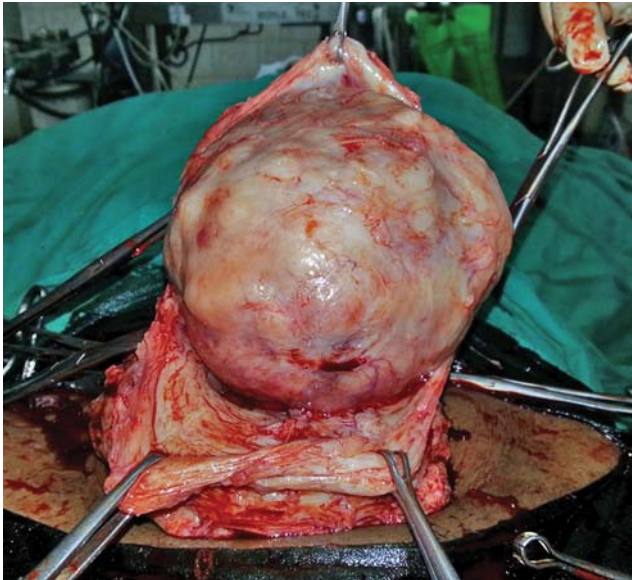


Fig. 15.30: The fibroid is enucleated from its bed by sharp and blunt dissection.

14. VAGINAL HYSTERECTOMY

Preliminaries

- ♦ Under general or epidural anesthesia, patient is placed in lithotomy position.
- ♦ Antiseptic cleaning and drapings are done.
- ♦ Bladder is evacuated by a metal catheter.
- ♦ Vaginal examination is done.
- ♦ Sim's posterior vaginal speculum is introduced. Anterior lip of the cervix is held and pulled down by a multiple toothed vulsellum.
- ♦ A metal catheter is introduced to know the lower limit of the bladder.
- ♦ An inverted 'T' shaped incision is made on the anterior vaginal wall. The horizontal incision is made below the bladder and the vertical incision is made starting from the midpoint of the transverse incision upto a point about 1.5 cm below the external urethral meatus (Fig. 15.31).
- ♦ The triangular vaginal flaps including the fascia on either sides are dissected off by knife and gauze dissection (Fig. 15.32).
- ♦ The vesicocervical ligaments are dissected out and divided (Fig. 15.33). The bladder is then pushed up by gauze covered finger till the peritoneum of the uterovesical pouch is visible (Fig. 15.34).

Actual steps

- ♦ The U-V pouch peritoneum is cut open. Landon's retractor is introduced to push up the bladder (Fig. 15.35).
- ♦ The posterior vaginal wall is cut at the level of the cervicovaginal junction (Fig. 15.36). The vaginal wall is dissected down till the pouch of Douglas (POD) is reached. The peritoneum of the POD is cut open (Fig. 15.37).
- ♦ **First clamp** is now placed. This clamp includes: Uterosacral ligament, Mackenrodt's ligament and the descending cervical artery (Fig. 15.38). The tissues are cut close to the cervix. The clamp is replaced by vicryl 'O' or chromic catgut No. I suture. Similar steps are done on the other side.
- ♦ **Second clamp** includes the uterine artery (Fig. 15.39). Tissues are cut → clamp is replaced by ligature as above. Similar steps are repeated on the other side.
- ♦ The fundus of the uterus is brought out through the anterior pouch by a pair of Allis tissue forceps.
- ♦ **Third clamp** includes round ligament, fallopian tube, mesosalpinx and the ligament of ovary (Fig. 15.40). Structures are cut and replaced by ligature as above. Similar steps are repeated on the other side. The uterus is removed.

- ♦ **The peritoneum** is closed by a pursestring suture.
- ♦ The sutures of the pedicle containing the uterosacral, Mackenrodt ligaments are passed through the vaginal vault cross-wise and are held temporarily.
- ♦ Steps of anterior colporrhaphy are now followed.
- ♦ Redundant vaginal flaps are excised and the margins are approximated by interrupted sutures.
- ♦ **The cross-wise passed sutures** of the lowermost pedicles are now tied, thus fixing the ligaments with the vaginal vault.
- ♦ Colpoperineorrhaphy is done (described above).
- ♦ Vaginal packing may be done (see above).
- ♦ Self-retaining catheter is introduced.

Q. What are the complications of vaginal hysterectomy and PFR?

Ans.

| Operative | Postoperative | Late |
|------------------------------|-------------------|---|
| Hemorrhage | Urinary retention | Vault |
| Trauma to bladder and rectum | VVF and RVF | Prolapse |
| VVF, RVF | Hemorrhage | Recurrence of Primary, secondary prolapse |
| | | <ul style="list-style-type: none"> • Infection • Pelvic abscess |

Important Figures of Vaginal Hysterectomy



Fig. 15.31: The cervix is pulled down by a multiple toothed vulsellum. Three Allis tissue forceps are placed. Bladder bulge and the lower margin of the bladder is also seen. An inverted 'T' shaped incision is made on the anterior vaginal wall.



Fig. 15.32: Vaginal flaps including the fascia on either side are dissected off by knife and gauze dissection



Fig. 15.33: The bladder is lifted up with the fingers following dissection of the vesico-cervical ligaments.

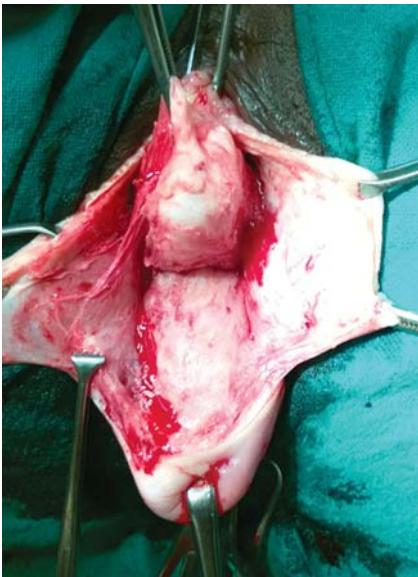


Fig. 15.34: The bladder is pushed up by sharp and blunt dissection (gauze covered fingers) till the peritoneum of the utero-vesical pouch is visible.

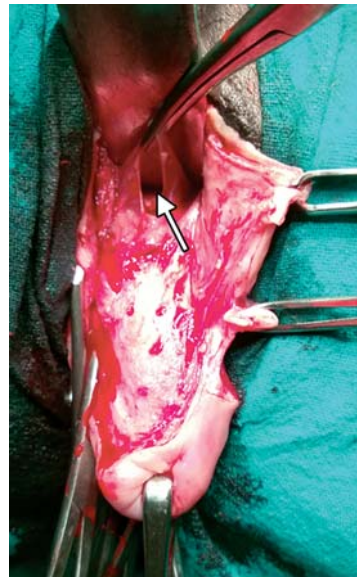


Fig. 15.35: Utero-vesical pouch of peritoneum is cut open (see arrow). Landon's retractor is introduced to push up the bladder



Fig. 15.36: Incision is made on the posterior vaginal wall at the level of cervico-vaginal junction.

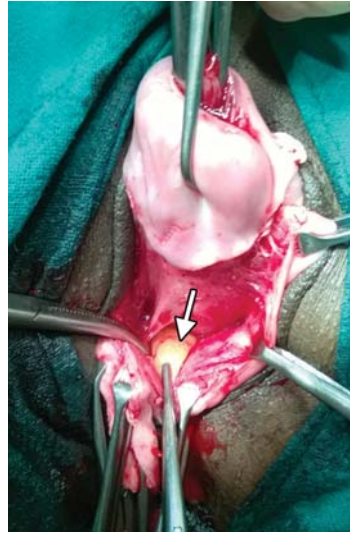


Fig. 15.37: The posterior vaginal wall is dissected down till the pouch of Douglas (POD) is reached and then the peritoneum of the POD is cut open (See arrow).

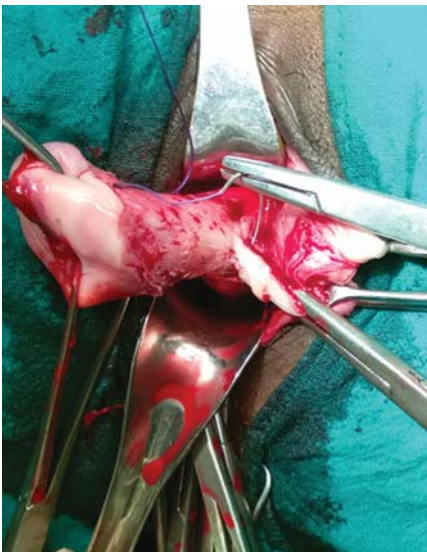


Fig. 15.38: The uterosacral and Mackenrodt's ligaments (complex) are clamped and cut. The clamp is replaced by vicryl '0' or chromic catgut no. 1 suture. Similar steps are done on the other side.

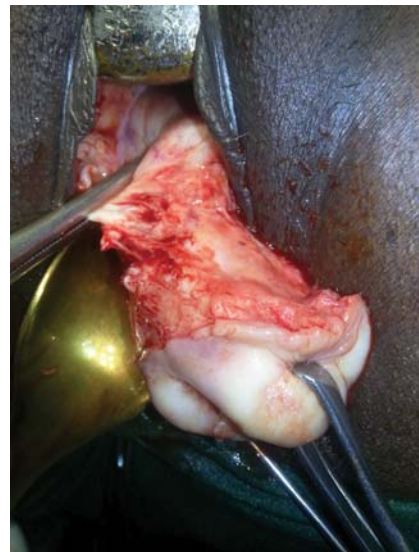


Fig. 15.39: Clamping, cutting and transfixation of uterine artery is done. Similar steps are done on the other side.



Fig. 15.40: Clamps are placed at the cornu of the uterus to hold round ligament, fallopian tube, mesosalpinx and the ligament of ovary. Structures are cut and replaced by ligature. Similar steps are done on the other side.

15. ANTERIOR COLPORRHAPHY

Indications

Repair of (i) cystocele, (ii) urethrocele and as a part of (iii) vaginal hysterectomy and repair of pelvic floor (PFR).

Preliminaries

Preliminaries are the same as in vaginal hysterectomy

Important steps

- ♦ To proceed the steps as that of vaginal hysterectomy, upto pushing up the bladder and to see the peritoneum of the uterovesical (U-V) pouch (see p 441).
- ♦ The pubocervical fascia is plicated by interrupted sutures with No. 'O' Chromic catgut using atraumatic needle.
- ♦ The redundant portion of the vaginal mucosa is excised on either side.
- ♦ The cut margins of the vagina are apposed by interrupted sutures with No. 'O' Chromic catgut using atraumatic needle.
- ♦ The metal catheter is introduced once again to be sure that bladder is not injured.
- ♦ Cleaning of the vagina is done.
- ♦ Vagina may be packed with a roller gauze smeared with antiseptic cream.
- ♦ A self-retaining catheter is introduced.

16. COLPOPERINEORRHAPHY

Indications

Repair of (i) relaxed perineum, (ii) rectocele, (iii) enterocele and as a part in the operation of (iv) vaginal hysterectomy and repair of pelvic floor (PFR).

Preliminaries

Preliminaries are the same as in vaginal hysterectomy (see p 441)

Principal steps

- ♦ A pair of Allis tissue forceps are placed one on each side at the lower end of the labium minus and a third of Allis forceps is placed on the posterior vaginal wall in the midline well above the rectocele bulge (Fig. 15.41).
- ♦ A horizontal incision is made on the mucocutaneous junction joining the two Allis tissue forceps below.
- ♦ Through the midpoint of this incision, another vertical incision is made upto the third Allis tissue forceps of the apex.
- ♦ Two triangular vaginal flaps are dissected off laterally from the perineal body and the rectum. The rectum and the levator ani muscles are exposed (Fig. 15.42).
- ♦ The redundant vaginal flaps are excised.
- ♦ The rectocele is corrected by suturing the pararectal fascia.
- ♦ Two or three interrupted sutures are passed through the levator ani using No.'1' chromic catgut. The knots are to be made at a later stage.
- ♦ The cut margins of the posterior vaginal walls are approximated starting from the apex. No. 'O' chromic catgut stitches are used. When the sutures reach the perineal body, the knots for the sutures of the levator ani muscles are placed.
- ♦ The rest of posterior vaginal wall and the skin margins are apposed using interrupted sutures.
- ♦ Cleaning of the vagina is done.
- ♦ Vaginal pack, soaked with antiseptic lotion (betadine) may be used.

Important Figures of Colpoperineorrhaphy

Fig. 15.41: Allis tissue forceps are placed on the posterior vaginal wall. The midline bulge of the rectocele is seen.

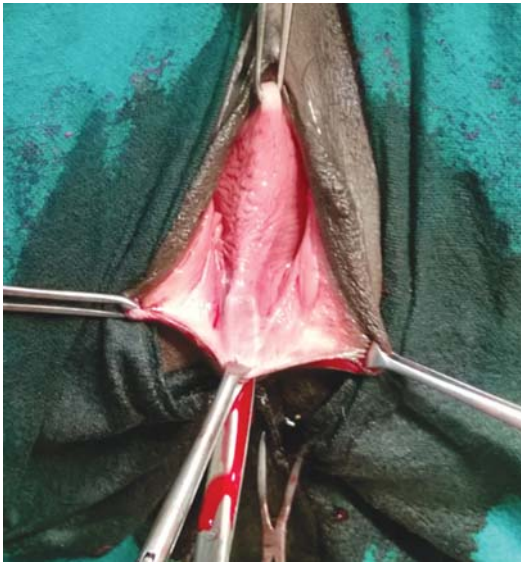


Fig. 15.42: The posterior vaginal wall is dissected off from the perineal body and the rectum to expose the levator ani muscles

17. LARGE LOOP EXCISION OF TRANSFORMATION ZONE (LLETZ)

Q. What is LLETZ?

Ans. Large Loop Excision of transformation zone is a simple procedure with minimal complications. A thin stainless steel wire is used (Fig. 15.43) for excision of the TZ. Tissue upto 10 mm thick can be removed with the procedure.

Q. What are the advantages of LLETZ?

Ans. Abnormal area of the cervix could be removed with LLETZ and the excised tissue material could be sent for histology (Fig. 15.42).

Q. How this LLETZ works?

Ans. LLETZ works on tissue effects of electricity. Tissue cutting and coagulation effects are present (blended) at the same time. Sometimes a rollerball is used for electrocoagulation of the bleeding sites.

Q. What are the complications of LLETZ procedure?

Ans. Complications are less. Bleeding, infection and vaginal discharge are common. Increased risks of preterm labor has been mentioned.

Q. What are the contraindications of LLETZ?

- Ans.** (a) Evidence of microinvasive or invasive disease on cytology, colposcopy or biopsy.
 (b) Lesion is not seen entirely.
 (c) Endocervical glandular involvement on endocervical curettage.

Important Figures of LLETZ

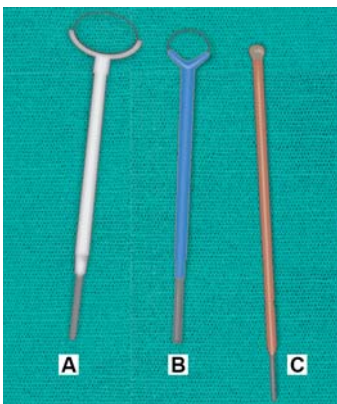


Fig. 15.43: Loops for LLETZ procedure
 Loops (A & B) for tissue excision and roller ball (C) for coagulation in LLETZ procedure

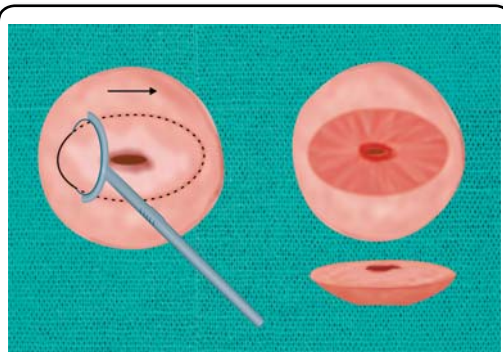


Fig. 15.44: Procedure of Loop excision. The entire abnormal area on the cervix is removed by a single pass. Tissue excised, is to be sent for histology examination

18. RADICAL HYSTERECTOMY

Q. What are the tissues removed in radical hysterectomy ?

- Ans.** (i) Uterus and cervix
(ii) The tubes and the ovaries (may be preserved in a young woman).
(iii) Wide parametrial tissues.
(iv) Superior vesical artery.
(v) Cardinal and uterosacral ligaments.
(vi) Upper three-fourth of vagina.
(vii) Pelvic lymph nodes (external, internal, common iliac and obturator nodes).
(viii) Para-aortic lymph node sampling is done if found enlarged.

Q. What are the complications of radical hysterectomy ?

- Ans.** Complications:
(a) As observed following abdominal hysterectomy
(b) Ureteric fistula
(c) Vesico-vaginal fistula
(d) Urinary tract infection
(e) Bladder dysfunction
(f) Lymphocyst formation

Q. Preventive measures for carcinoma cervix—primary and secondary prevention:

Ans. A. Primary prevention:

- (a) Prophylactic HPV vaccination
- (b) Use of condom
- (c) Removal of cervix during hysterectomy
- (d) Identifying 'high risk' female and males

B. Secondary prevention

- (a) Cervical cancer, screening procedures (cytology), HPV-DNA, V1A and colposcopy

Q. What is the role of human papilloma virus (HPV) in cancer cervix?

- Ans.** Infection with high oncogenic risk types of HPV (Types 16, 18, 31, 33, 35, 45, 56) is mainly responsible for cervical cancer. Over 99% of patients with CIN and invasive cancer are found to be positive with HPV-DNA.

Q. What is the pathogenesis of HPV infection in cancer cervix?

Ans. High risk HPV (Types 16,18,31,33) infection of cervical epithelium
→ Expression of E6 and E7 oncoproteins → HPV induced neoplastic transformation of cervical epithelium → CIN → invasive cancer

Q. Causes of death in carcinoma cervix:

Ans. Patients of cancer cervix die of complications when left untreated

- a) Uremia due to urteric obstruction
- b) Sepsis
- c) Cachexia
- d) Metastasis (lung and lymph nodes)

Q. Differential diagnosis of carcinoma cervix:

Ans. Cervical tuberculosis, fibroid polyp, syphilitic ulcer, products of conception in incomplete abortion

ENDOSCOPIC SURGERY IN GYNECOLOGY

Synonym: Minimally Invasive Surgery (MIS)

Introduction of endoscopic surgery (laparoscopy and hysteroscopy) has mostly replaced the traditional laparotomy in gynecology these days. It is possible to visualize the abdominal cavity with laparoscopy and the uterine cavity by doing hysteroscopy. Laparoscopy and hysteroscopy can be done both for the purpose of diagnosis as well as for surgical procedures.

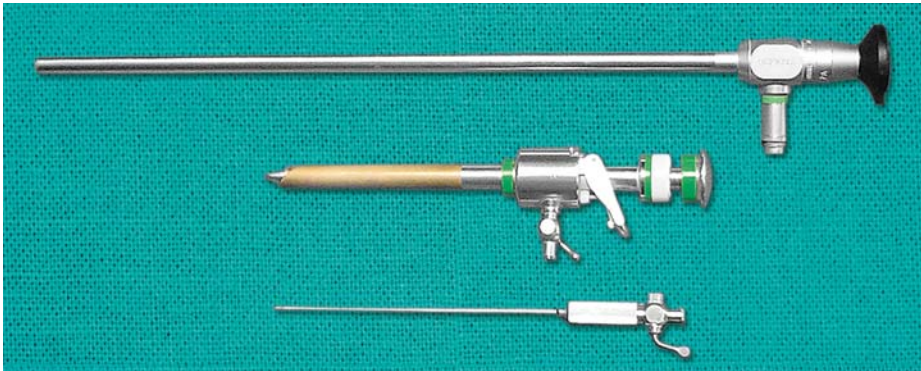


Fig. 15.45: Laparoscopic instruments: (A)Telescope (B) Trocar and cannula (C) Veress needle

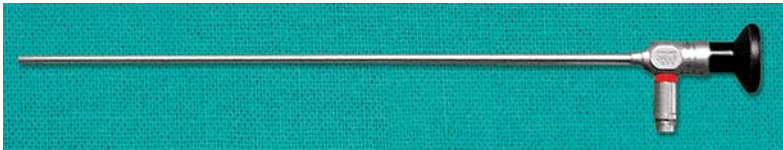


Fig. 15.46: Hysteroscope



Fig. 15.47: Hysteroscope with working element for operative interventions
(outer diameter : 8 mm)



Fig. 15.48: Resectoscope (with an angled cutting loop)

Q. Discuss briefly the pneumoperitoneum:

Ans: Pneumoperitoneum is created with a specially designed needle called Veress needle (Fig. 15.45C). It is introduced into the peritoneal cavity making a small incision (1.25 cm) below the umbilicus. Abdomen is inflated with about 1–4L of carbon dioxide gas. Intraoperative pressure should not increase >20 mmHg.

Q. Why CO₂ is preferred for the creation of pneumoperitoneum?

Ans: a) CO₂ is a gas soluble in blood and is rapidly absorbed
 b) Risk of embolism is less
 c) It does not support combustion when electrodiathermy is used inside.

Q. How the correct placement of Veress needle is ascertained?

Ans: Different methods are there to ascertain the correct placement of the needle:

- Hanging drop method.
- Syringe barrel test: Aspiration is done to exclude inadvertent injury to any organ. (Examples are: blood from vessel puncture, urine from bladder puncture and fecal matter from bowel puncture).
- Low intra-abdominal pressure (<10 mmHg) on correct placement of the needle
- Obliteration of liver dullness on percussion when there is free flow of CO₂ inside the abdominal cavity.

Q. What are the different methods of hemostasis used during laparoscopic surgery?

Ans. 1. Electrocoagulation:

- Monopolar electrosurgery
- Bipolar electrosurgery.

- Laser coagulation (using CO₂, KTP-532 and Nd-YAG lasers)
- Ligasure—to cut and seal blood vessels
- Enseal vessels fusion where tissues are desiccated and cut
- Mechanical clips and staples (titanium clips and staples)
- Sutures as used in open surgery.

Q. What are the complications of laparoscopic surgery?

Ans: Complications may be specific to laparoscopic surgery.

These are:

- a) Extraperitoneal insufflations leading to surgical emphysema.
- b) Cardiac arrhythmias due to CO₂ absorption.
- c) Injury to blood vessels (mesenteric, inferior epigastric vessels).
- d) Injury to viscera: Bowel, bladder.
- e) Complications due to electrosurgical methods: thermal injury to bowel, bladder and ureter
- f) Other complications are: due to anesthesia, infections, hemorrhage etc.

Q. What are the contraindications of laparoscopy?

- Ans.**
- a) Severe cardiopulmonary disease
 - b) Patient hemodynamically unstable
 - c) Extensive peritoneal adhesions
 - d) Generalized peritonitis

Q. What is hysteroscopy?

Ans. Endoscopic visualization of the cervical canal as well as the uterine cavity, is known as hysteroscopy. Hysteroscopy may be done for diagnostic as well as therapeutic purposes.

Q. What is the distension media used in hysteroscopy?

Ans. a) CO₂, b) normal saline, c) glycine 1.5%, d) mannitol (5%)

Q. What are the contraindications of hysteroscopy?

- Ans.**
- a) Pelvic infection
 - b) Pregnancy
 - c) Cervical cancer
 - d) Cardiopulmonary disorders.

LAPAROSCOPY

It is the visualization of peritoneal cavity using a telescope with cold light and fiber optics. Abdominal cavity is distended using a gas (CO_2 is commonly used). Diagnostic laparoscopy does not need much of instruments and electrosurgical energy source. Imaging system includes a telescope, light source, fiberoptic cord, camera units and monitors. **Laparoscopic surgical procedures** need basic instruments (graspers, scissors, aspirator, irrigator, morcellator, uterine manipulator and electrosurgical energy sources) and the imaging system (Fig. 15.45).

Advantages of Laparoscopy Over Laparotomy

- ♦ No large abdominal incisions
- ♦ Less blood loss
- ♦ Rapid postoperative recovery
- ♦ Less postoperative pain and reduced need of postoperative analgesia
- ♦ Shorter hospital stay and reduced concomitant cost
- ♦ Quicker resumption of day-to-day activity
- ♦ Less adhesion formation
- ♦ Minimal abdominal scars (cosmetic value)
- ♦ Reduced risk of incisional hernia
- ♦ Increased patient satisfaction.

Indications of Laparoscopy

A. Diagnostic Laparoscopy

- ♦ Infertility work up (chromopertubation)
- ♦ Chronic/acute pelvic pain (adhesions and endometriosis)
- ♦ Pelvic mass: Fibroid and ovarian cyst
- ♦ Ectopic pregnancy
- ♦ Amenorrhea
- ♦ Suspected müllerian abnormalities

B. Operative Laparoscopy

- | | |
|---------------------------------------|-----------------------------------|
| ♦ Tubal sterilization | ♦ Adhesiolysis |
| ♦ Ovarian surgery (cystectomy/biopsy) | ♦ Endometriosis |
| ♦ Ectopic pregnancy (salpingostomy) | ♦ Myomectomy |
| ♦ Hysterectomy | ♦ Retroperitoneal lymphadenectomy |

Complications of Laparoscopy

Complications may be at different levels:

A. ♦ Veress needle: Injury to bowel, blood vessels, bladder and surgical emphysema.

♦ **Trocar and cannula:** Same as above.

♦ **Electrosurgical complications:** Thermal injury.

♦ **Pneumoperitoneum:** Gas (CO_2) embolism and arrhythmia.

B. ♦ Anesthetic complications:

♦ Hypercarbia, acidosis and basal lung atelectasis.

C. ♦ Common to any surgery: ■ Hemorrhage ■ Infection ■ Postsite hernia.

Laparoscopic View of Pelvic Organs in Health and Disease

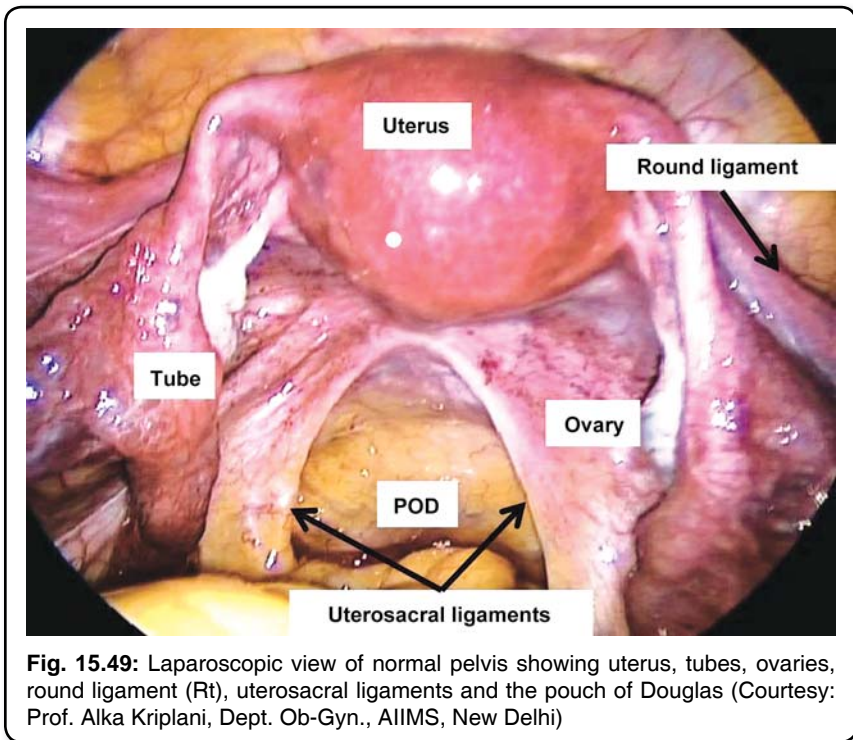


Fig. 15.49: Laparoscopic view of normal pelvis showing uterus, tubes, ovaries, round ligament (Rt), uterosacral ligaments and the pouch of Douglas (Courtesy: Prof. Alka Kriplani, Dept. Ob-Gyn., AIIMS, New Delhi)

Q. What are the structures attached at the cornu of the uterus?

Ans. From anterior to posterior, structures are:

- Round ligament (*arrow in figure 15.49*) in front
- Fallopian tube (*middle*)
- Ligament of ovary (*posteriorly*).

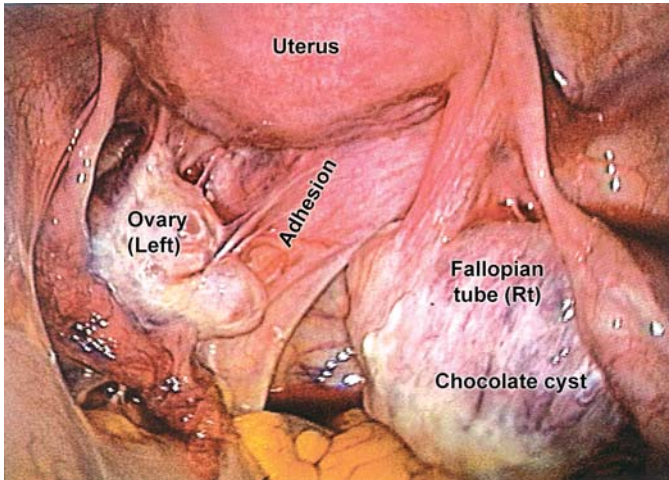


Fig. 15.50: Laparoscopic view of pelvic endometriosis. Right-sided chocolate cyst with enlarged ovaries. There are adhesions in the POD and the left ovary

Q. What is the best method to diagnose pelvic endometriosis ?

Ans. Double puncture laparoscopy is considered the 'gold standard' for the diagnosis of pelvic endometriosis. **Benefits of laparoscopy are:** (a) Confirmation of diagnosis, (b) staging the disease, (c) biopsy if needed and (d) treatment at the same time.

Q. What is the classic appearance of endometriotic lesions on laparoscopy ?

Ans. Lesions may appear (a) black dots—'powder burns', (b) red flame-shaped areas, (c) red polypoid areas, (d) yellow brown patches, (e) white peritoneal areas, (f) circular peritoneal defects, (g) ovarian endometriomas – chocolate cysts and (h) pelvic adhesions.

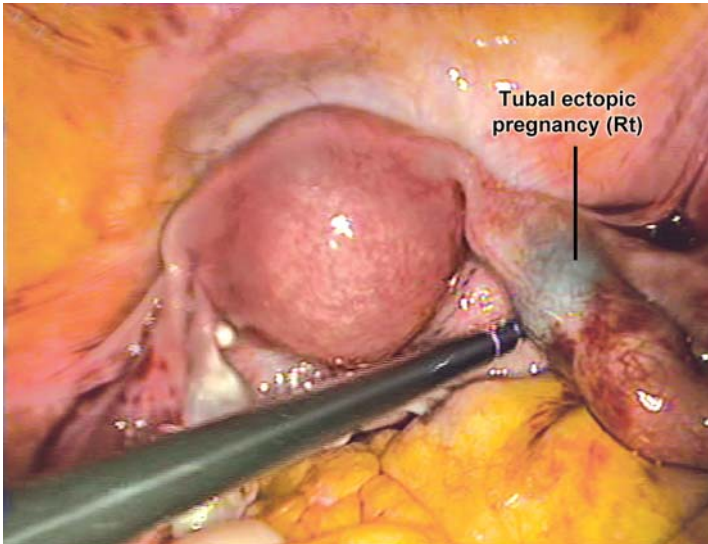


Fig. 15.51: Laparoscopic view of uterus, both the tube and ovaries showing right-sided unruptured tubal ectopic pregnancy

Q. How laparoscopy could be helpful in the diagnosis and management of unruptured tubal ectopic pregnancy?

Ans. Women in reproductive age with features suggestive of ectopic pregnancy (delayed period, lower abdominal pain, lower level of β -hCG value and empty uterine cavity on transvaginal sonography) should have the benefit of laparoscopy.

Advantages are : (a) confirmation of diagnosis and (b) treatment could be done at the same time.

Q. What are the different management options for unruptured tubal ectopic pregnancy?

Ans. (A) Expectant management: Only observation hoping spontaneous resolution.

(B) Conservative management : (i) Medical management (methotrexate and KCl) and (ii) surgical management (salpingostomy).

(C) Salpingectomy.

Q. What is the risk of recurrence of tubal ectopic in subsequent pregnancy ?

Ans. About 10–12%.

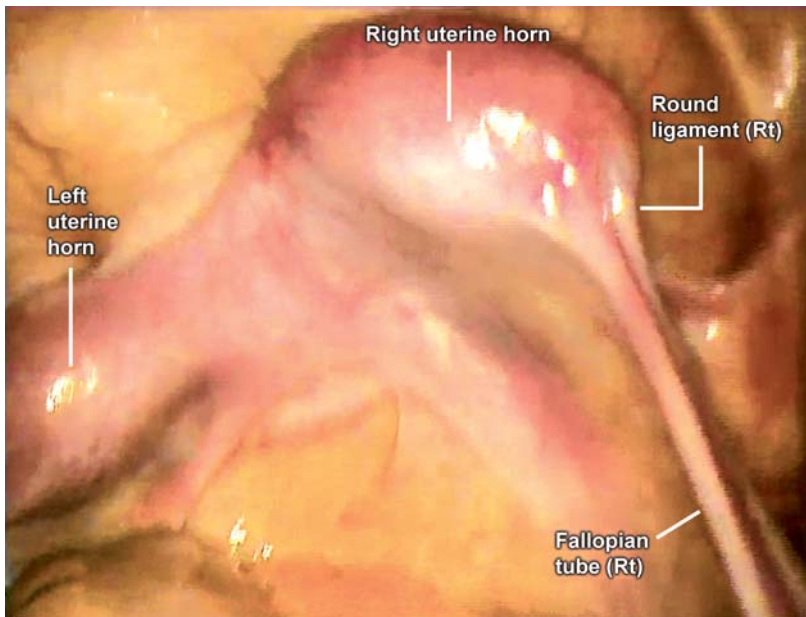


Fig. 15.52: Laparoscopic view of a bicornuate uterus. Both the horns are seen. Left sided horn is seen smaller compared to the right one. Patient suffered recurrent fetal loss ($P_{0+3+4+0}$)

Q. What type of abnormality is this one ?

Ans. It is the maldevelopment of the uterus. It is due to failure of fusion of two Mullerian ducts. According to American Fertility Society (AFS) classification of Mullerian anomalies, it belongs to class IV.

Q. What is the clinical presentation of a woman with this abnormality?

Ans. The woman may not have any symptoms. But in some, clinical presentation may be with gynecological and/or obstetrical symptoms.

A. Gynecological

- Dysmenorrhea ■ Menstrual disorders—menorrhagia ■ Infertility.

B. Obstetrical

- Miscarriage (recurrent) ■ Cornual pregnancy ■ Preterm labor
- Malpresentaton ■ IUGR and IUFD.

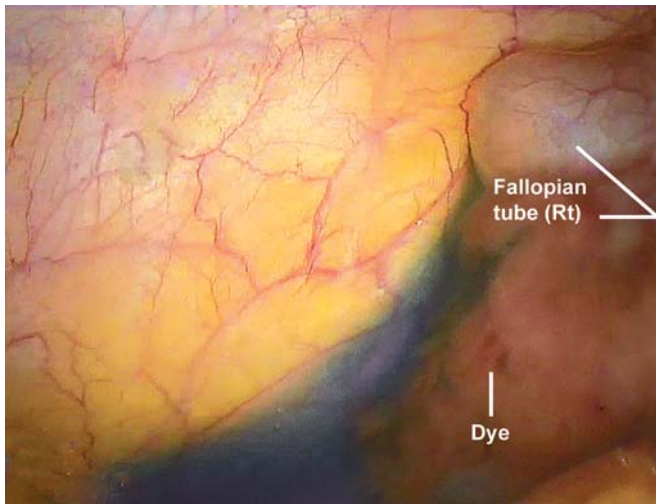


Fig. 15.53: Laparoscopic chromopertubation. Methylene blue dye is seen to come out of the abdominal ostium of the right fallopian tube.

Q. *What are the advantages of laparoscopic chromopertubation over hysterosalpingography?*

Ans. see SAQ 3 on p 382.



Fig. 15.54: Operative laparoscopic procedure in progress. Optimal placement of ports shown. Ipsilateral surgical procedures done.

HYSTEROSCOPY

Hysteroscopy is a procedure that allows visualization of the endocervical canal and the uterine cavity. It is used both for the purpose of diagnosis and therapy.

Basic instruments and equipment for hysteroscopy are:

(a) Telescope (Fig. 15.46), (b) distending media (gas CO₂ or liquid media: normal saline or glycine 1.5%), (c) working elements for operative procedures: Resectoscope (Fig. 15.48), cutting loop electrode, ball electrode, scissors and biopsy forceps.

Imaging system is similar to that of laparoscopy.

Indications of Hysteroscopy

Diagnostic

A. Abnormal Uterine Bleeding

- ♦ Endometrial polyp
- ♦ Submucous fibroid
- ♦ Postmenopausal bleeding
- ♦ Missing IUCD
- ♦ Endometrial cancer.

B. Infertility Work Up

- ♦ Uterine synechiae
- ♦ Filling defect on HSG
- ♦ Uterine septum

C. Mullerian Anomalies

- ♦ Subseptate, septate, bicornuate uterus or uterus didelphys can be diagnosed. This procedure is combined with laparoscopy for confirmation.

D. Recurrent Miscarriage

- ♦ Intrauterine pathology (Asherman's syndrome, fibroids and polyps) for diagnosis and treatment.

E. Misplaced IUCD (for diagnosis and removal).

Operative Hysteroscopy

A. Polypectomy and myomectomy

B. Endometrial ablation/resection

C. Metroplasty (resection of uterine septum)

D. Release of intrauterine adhesions (synechiolysis)

E. Removal of intrauterine foreign body (IUCD)

F. Endometrial biopsy under direct vision (endometrial cancer)**G. Tubal cannulation****H. Tubal sterilization (essure)****Complications of Hysteroscopy**

Complications may be due to any of the following factors:

A. Distension Media

- Fluid overload (due to absorption)
- Pulmonary edema and cerebral edema
- Electrolyte imbalance
- Embolism.

B. Operative Procedures

- Uterine perforation
- Hemorrhage — during or after the operation
- Injury to intra-abdominal organs.

C. Electrosurgical— Thermal injury to intra-abdominal organs.

D. Others— Infection and anesthetic complications.

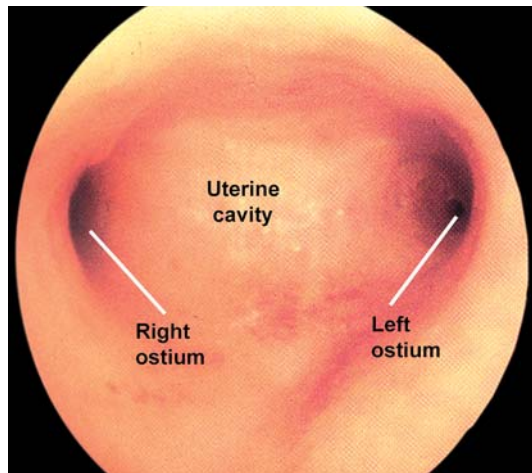
Hysteroscopic View of the Uterine Cavity

Fig. 15.55: Hysteroscopic view of normal uterine cavity. Both the ostia are seen

Q.1. *What is the place of hysteroscopy for the purpose of infertility work up?*

Ans. See p 460.

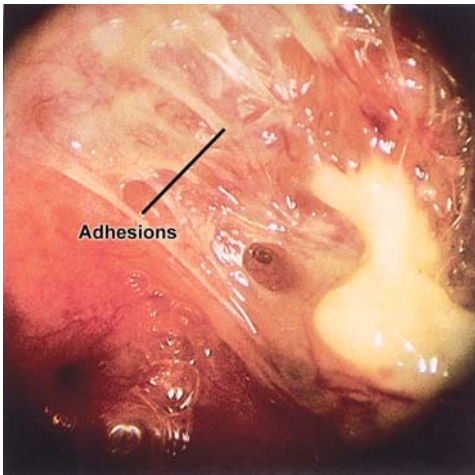


Fig. 15.56: Hysteroscopic view of intrauterine adhesions (*Asherman's syndrome*)

Q.1. What are the common causes of Asherman's syndrome ?

Ans. Overzealous curettage in postabortal or puerperal phase is often responsible. It may be due to tuberculous endometritis also.

Q.2. How does a woman with Asherman's syndrome usually present ?

Ans. Menstrual abnormality in the form of hypomenorrhea, oligomenorrhea or amenorrhea depending upon the extent of adhesions (partial or total).

Q.3. How the condition is treated ?

Ans. Hysteroscopic adhesiolysis followed by insertion of an IUCD is usually effective.

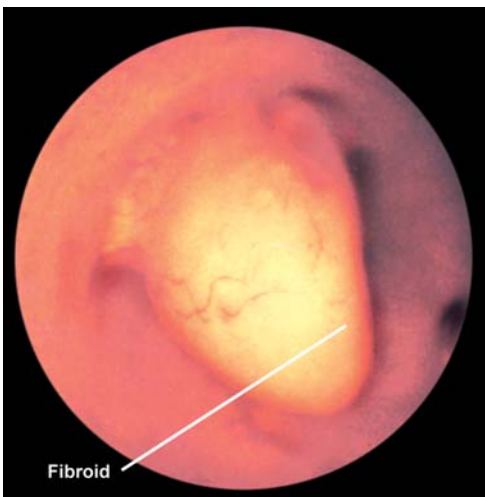


Fig. 15.57: Hysteroscopic view of a submucous fibroid polyp (Grade – 0)

Q. What could be the symptoms of this woman?

- Ans.** (a) Menorrhagia (b) Metrorrhagia
(c) Dysmenorrhea (d) Infertility
(e) Recurrent Miscarriage

Q. What is the management option for this patient?

- Ans.** (a) Hysteroscopic resection of the fibroid using the resectoscope.
(b) Hysterectomy may be the other option.

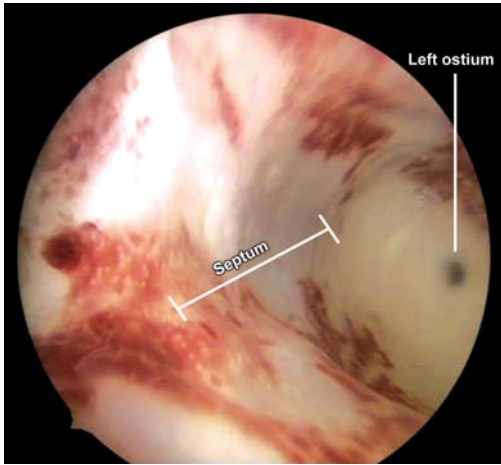


Fig. 15.58: Septate uterus. Left-sided uterine ostium is seen at a depth. Common complications associated with a septate uterus are:
A. In gynecology: Infertility, recurrent miscarriage, B. In obstetrics: Malpresentation, preterm labor.

Mrs. Murthy, a 27-year old lady presented with history of recurrent miscarriage ($P_{0+0+5+0}$). Thorough investigation with laparoscopy and hysteroscopy revealed a complete uterine septum (Fig. 15.58).

Q. What type of abnormality is this one?

- Ans.** The two Müllerian ducts have partially fused together but there is the persistence of the septum in between the two. This septal persistence may be complete or incomplete.

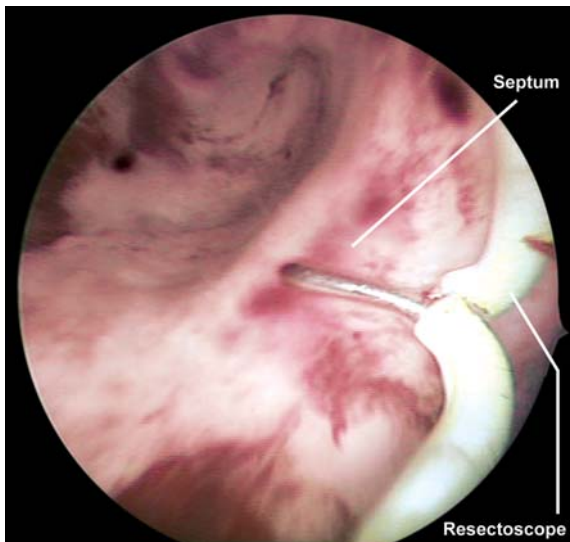


Fig. 15.59: Same patient with complete septum. Resection of the septum is being done using the resectoscope. Presently she is under supervision for her sixth pregnancy (following septum resection)

Q. What are the benefits of hysteroscopic metroplasty?

- Ans.** (a) High success rate (80–89%)
(b) Reduced postoperative morbidity
(c) Short hospital stay (2–3 days)
(d) Successful pregnancy
(e) High chance of vaginal delivery.

Q. What are the complications of operative hysteroscopy?

Ans. see p 461



Fig. 15.60: Operative hysteroscopic procedure in progress

LAPAROSCOPIC TUBAL STERILIZATION

Q.1. What are the different methods of tubal sterilization?

Ans. Methods are

A. Open Surgical

- (i) Minilaparotomy (commonly done) or (ii) Laparotomy procedure (Ligation of the tubes using sutures see p 427)

B. Laparoscopic Methods for tubal occlusion using rings or clips

- (i) Fallope ring method (commonly used in India), (ii) Filshie clip method (Titanium lined with Silicon rubber), (iii) Hulka Clemens clip (Spring loaded)

C. Laparoscopic methods using electrodiathermy (less commonly done)

- (i) Bipolar electrocautery, (ii) Monopolar electrocautery

D. Hysteroscopic method of tubal block

- (i) Essure (microcoil) inserted within the tubes, (ii) Insertion of quinacrine pellets, (iii) Adiana- procedure of blocking the tube using radiofrequency energy and also with silicon palette

Q.2. When should ideally the laparoscopic tubal sterilization be done?

Ans. It is best done in the interval period or 6 weeks following delivery or termination of pregnancy.

Q.3. What are the other laparoscopic procedures that can be done for tubal sterilization?

Ans. (a) Filshie clip, (b) Hulka-Clemens spring clip and (c) electrosurgical methods (monopolar, bipolar or lesser photocoagulation of the tube).

Q.4. What is the Fallope ring made of?

Ans. It is a sialastic ring made of silicon rubber with 5% barium sulfate (Fig. 15.61 p 466).

Q.5. How much length of the tube is destroyed in this procedure?

Ans. About 2.5 cm.

Q.6. What is the failure rate of the procedure ?

Ans. 0.1%, if done correctly and by a trained person.

Q.7. What are the advantages of laparoscopic tubectomy?

- Ans.**
- a. Simple surgical steps
 - b. Easier (trained person) to perform
 - c. Effective
 - d. Minimal damage to the tube (4 mm)
 - e. Low failure rate (0.2–0.6%)
 - f. Less hospital stay (3–4 hours)
 - g. Early resumption of day to day work.

Q.8. What method of is superior in terms of tubal reversal (recanalisation) with higher success rate?

Ans. It depends upon the extent of tubal damage and the fibrosis within the tube after the procedure. Filshie clip is superior to all other methods. However Falloope ring is better compared to pomerooy method.

Figures (15.61 to 15.66) Showing Instruments Used for Laparoscopic Sterilization

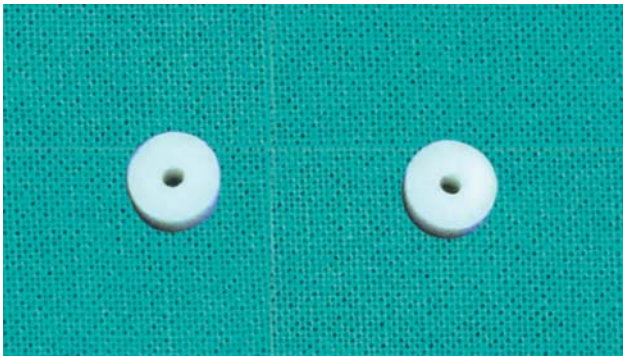


Fig. 15.61: Falloope Rings used for Laparoscopic Sterilizaition

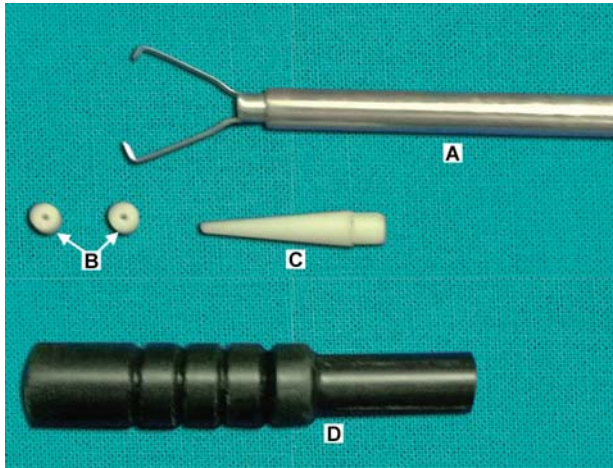
Description and Use: This is a silicon rubber ring having its inner diameter 1 mm and outer diameter of 3 mm. Its thickness is 2 mm. The rings are loaded over a ring applicator using the loader and pusher. To maintain the rings effective elastic memory, the ring should not be stretched more than 6 mm for a period not more than 3 minutes. It occludes a segment of the fallopian tube including the mesosalpingel blood vessels. The segment of the tube undergoes avascular necrosis and falls off.



Fig. 15.62: Falloope ring applicator with two ends; a) One end showing the tongs to grasp the fallopian tube



Fig. 15.63: The upper end of the falloope ring applicator. It has got three rings. The middle and the index fingers go within the lower two rings and the thumb through the upper ring. This end maneuvers the instrument to grasp the tube and to release the falloope rings

**Fig. 15.64:**

A. Lower end of the fallope ring applicator. This end shows the tongs to grasp the fallopian tube. It has got a slot to accommodate the fallope rings

B. Fallope Rings

C. Ring loader

D. Ring Pusher

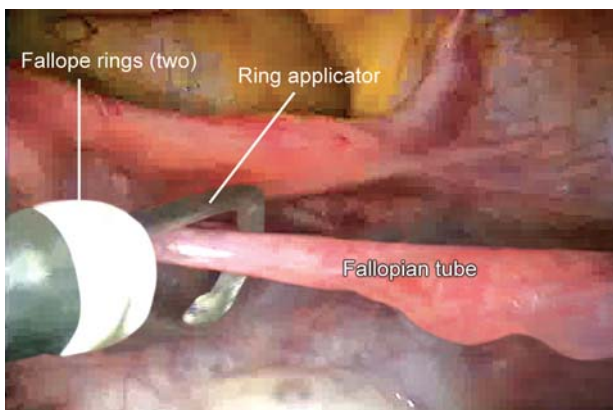


Fig. 15.65: Laparoscopic procedure for tubal sterilization using Fallope ring. Ring loaded applicator is seen to grasp the right tube

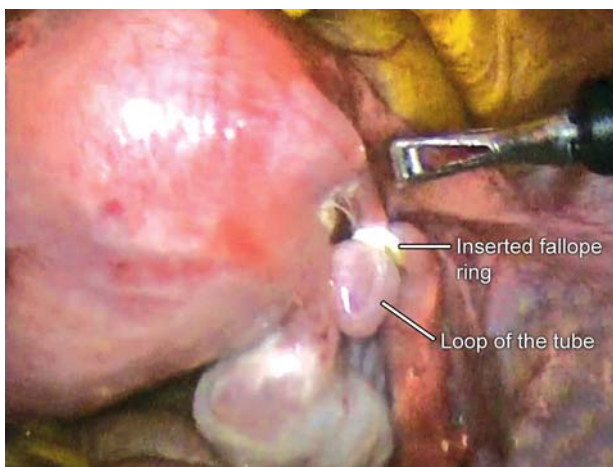


Fig. 15.66: Laparoscopic view of tubal sterilization. Fallope ring had been inserted and the loop of the Fallopian tube is seen blanched

ROBOTICS IN GYNECOLOGY

Robotic Surgery: It is facilitated laparoscopy having a computerized interface between the patient and the surgeon. Similar to laparoscopy most gynecological surgical procedures can be done with this robotic technique.

From technological point of view, robotic surgery is superior to laparoscopy specially in terms of accuracy, dexterity, time (suturing), and overall performance. Surgeon's fatigue is less. Robotic surgery is found to have less number of surgical complications compared to laparoscopy.

Robotic movements are intuitive where the tip of the instrument mimics the movements of the surgeon's hands (Fig. 15.67A and B). Whereas in laparoscopy the movements of the tip of the instruments are counter intuitive, opposite to the movements of the surgeon's hands. The instruments in robotic surgery allow complex maneuvers within a small space with seven degrees of freedom compared to four degrees in laparoscopy.

**A****B**

Fig. 15.67A and B: Hand movements versus robotic movements

Robotic surgery permits three dimensional view. This helps surgeon to have a greater depth of field to dissect tissues. This is specially important in delicate areas (major vessels, ureter) to dissect tissues. The Robotics increase surgical accuracy and reduces complications. The learning curve for robotic surgery is not long specially for those who are conversant with advanced laparoscopic surgery.



Fig. 15.68: The four armed surgical robotic system

Disadvantages are few. Tactile feel is absent with robotic surgery. Equipments are expensive (*Fig. 15.68*). Initial setup time needed for each case is long besides the surgeon's training cost.

CHAPTER 16

Practical Gynecology

1. Instruments
2. Specimens
3. Imaging studies Plates: X-ray, HSG, USG, CT, MRI
4. Drugs



INSTRUMENTS

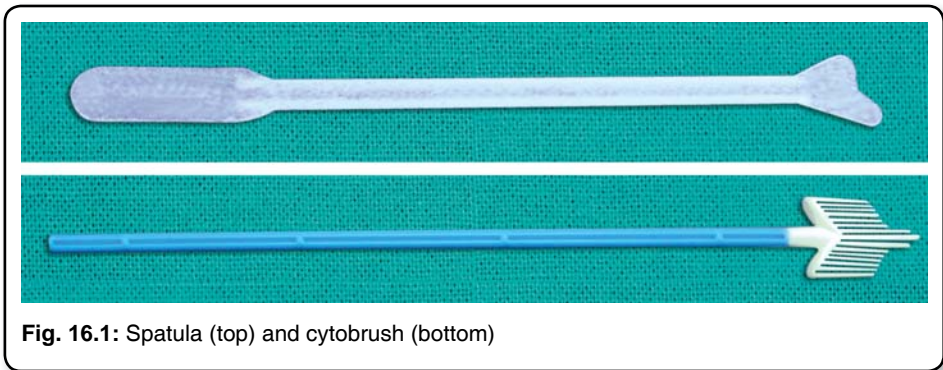
Chapter Objectives

Basic knowledge and understanding of:

- Identification of the instrument
- Uses
- Related surgical procedures with its use (Gynecology)
- Complications out of its use (as applicable)



A candidate is expected to be familiar with all the different items in the gynecology viva table

Fig. 16.1: Spatula and Cytobrush**Fig. 16.1:** Spatula (top) and cytobrush (bottom)

History: *Papanicolaou, George Nicholas (1883–1962), worked in New York hospital on exfoliative cytology for the diagnosis of cancer of the female genital tract. In collaboration with Dr. Herbert Trout, he published their landmark work in 1941. Later, in 1947, JAMES IRE simplified cell collection procedure with a wooden spatula. This is currently being used. In 1961 Papanicolaou became the director of the Miami Cancer Institute.*

Ayre's spatula (wooden or plastic) and the endocervical brush are used for **collection of cells for cytology screening**.

Uses

- For cervical cells—projected end of the spatula goes within the external os. The spatula is rotated 360° to collect cells from the entire ectocervix.
- For endocervical cells—the cytobrush goes within the cervical canal and is rotated to collect cells.
- For cytochemical study, the rounded end of the spatula is used.

Methods of slide preparation and fixation: The materials collected are immediately spread over a slide. Fixative (95% ethyl alcohol) is spread over it. Once dried up, the slide is then stained (in the laboratory) either with Papanicolaou or Sarr's method. It is examined under the microscope by a cytopathologist.

Self-assessment:

Q. Who are the women (at risk), that need cervical cytology screening?

- Ans.** ■ Any sexually active women over 18 years and up to 70 years of age.
- Others: (see p 373).

Q. What is the grading of Papanicolaou's smear?

Ans. Grading is total five—normal, infective, suspicious, few malignant cells and plenty of malignant cells. Bethesda system of classification is also followed (see p 476 and 477).

Q. What is a dyskaryotic smear? What are the different types of dyskaryotic smear?

Ans. Smear showing morphological abnormalities of the nucleus is called as dyskaryotic smear. The important morphological nuclear abnormalities are:

- a) Disproportionate nuclear enlargement
- b) Abnormalities of the nucleus in number, size and shape
- c) Hyperchromasia
- d) Condensation of chromatin material

Types are: a) Mild, b) moderate and c) severe, depending on severity.

Q. What is Koilocytosis?

Ans. It is the nuclear abnormalities of a cell, seen in HPV infection. The typical changes are—perinuclear halo, nuclear irregularity, hyperchromasia and multinucleation.

Q. What is CIN? How do you diagnose CIN?

Ans. It is the histological observation where part or whole of thickness of cervical squamous epithelium is replaced by cells with varying degrees of atypia. Basement membrane remains intact. Diagnosis of CIN is made by: (i) Cytology (ii) VIA (iii) colposcopy (iv) cervicography (v) biopsy and (vi) conization of cervix.

Q. How do you manage a case of CIN?

Ans. (a) Local ablative methods, (b) excisional methods or by (c) hysterectomy (see p 375).

Q. How to take cervical smear?

Ans. Cervix is exposed with a Cusco's bivalve speculum without any lubricant. Prior bimanual examination should not be done. Cells are obtained from the squamo columnar junction of cervix using Ayre's spatula. Endocervical cells are collected with the cytobrush. The collected materials are spread over a slide, fixed stained. It is then examined by a cytopathologist.

Q. How HPV infection and CIN are related and how it could be prevented?

Ans. High oncogenic risk HPV (types 16, 18, 31, 33, 35, 45, 56) types are responsible in the etiopathogenesis of CIN and invasive cancer cervix. 99.7% of cases with CIN and invasive cancer are found to be positive with HPV-DNA. Vaccines (cervarix, gardasil) are approved to all school girls (9–15 years) and women (16–26 years). Vaccine is found to be very effective in preventing HPV infection. Vaccines are type specific and effective only when used prophylactically (see p 394).

Fig. 16.2: Sims' Double Bladed Posterior Vaginal Speculum

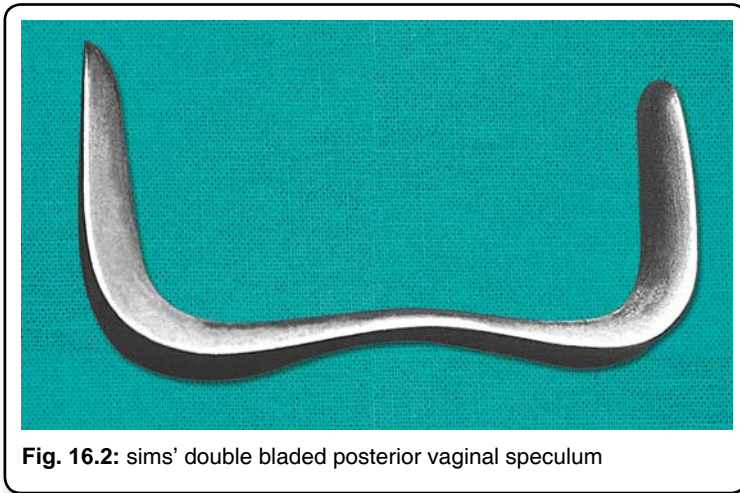


Fig. 16.2: sims' double bladed posterior vaginal speculum

The instrument was designed by Marion Sims. The blades are of unequal breadth. For description of an instrument see section: (section-1, chapter-8, p 252)

History: *Sims, James Marion (1813–1883) : Sims worked in Women's Hospital, New York. There he treated nearly 250 vesicovaginal fistula patients, a year with 75% cure rate. He designed this **speculum**. He used **silver thread** for repair of VVF. '**Sims position**'—the left lateral semiprone position goes by his name. Sims made many contributions to surgery and gynecology. In 1880, Sims became the president of American Gynecological Society. Sims relentless surgical work on VVF was recognized almost a century later by **John ChassarMoir**, who later became the master of surgery on VVF. A bronze statue of Marion Sims stands in the Central Park, New York.*

Uses

- It is commonly used in vaginal operations such as D + C, D + E, anterior colporrhaphy, vaginal hysterectomy, etc. to retract the posterior vaginal wall.
- To visualize the cervix and inspect the abnormalities in the anterior vaginal wall like cystocele, VVF or Gartner's cyst after placing the patient in Sims' position.
- To collect the materials from the vaginal pool for cytology or Gram stain and culture.

Self-assessment

- Sims' position
- Sims' triad (see p 339)
- Introduction of Sims' speculum
- **Indications of Dilatation and Curettage (D + C).**

A. Diagnostic:

- ◆ Infertility
- ◆ DUB
- ◆ Endometrial tuberculosis
- ◆ Postmenopausal bleeding

B. Therapeutic:

- ◆ Endometrial polyp.
- ◆ Removal of IUCD
- ◆ DUB (occasional)
- **Steps of Dilatation and Curettage (D + C).**

Important steps are:

- (a) Patient to empty her bladder.
- (b) The operation is done under general anesthesia or under diazepam sedation.
- (c) Lithotomy position.
- (d) Antiseptic cleaning and drappings.
- (e) Bimanual examination.
- (f) Sims posterior vaginal speculum is placed.
- (g) Anterior lip of the cervix is grasped with an Allis's tissue forceps.
- (h) A uterine sound is introduced.
- (i) Cervical canal is dilated with dilators of gradually increasing size.
- (j) Uterine curette is introduced and the uterine cavity is curetted gently but thoroughly.
- (k) Curette is removed and curetted material is collected.
- (l) The vulsellum/Allis's tissue forceps and the speculum are removed.
- (m) The endometrium is preserved (10% formaline) in a vial, labelled and sent for HPE.
- (n) The patient is observed for another 2-3 hours and may be discharged.

Q. Why are the blades of unequal sizes ?

Ans. This is to facilitate its introduction into the vagina. Narrow blade in nulliparous and the wider blade in parous women where more space is available.

Q. Lesions in the vaginal wall

Ans. Ulcers: Syphilitic, tubercular, chancroid and malignant. **Others:** Gartner's duct cyst, inclusion cyst.

Fig. 16.3: Cusco's Bivalve Adjustable Self-Retaining Vaginal Speculum**Fig. 16.3:** Cusco's Bivalve Adjustable Self-Retaining Vaginal Speculum

The valves are to retract the anterior and posterior vaginal wall so as to have a good look to the cervix.

A light source from behind is essential. It is commonly used in the OPD.

Uses

- To visualize the cervix and vaginal fornices.
- To collect vaginal pool materials and cervical smear for cytologic screening.
- To have cervicovaginal swabs for Gram stain and culture.
- To insert or to remove IUCD or to check the threads.
- To perform minor operations like punch biopsy, surface cauterization or snipping a small polyp.

Self-assessment

- Use of two blades (see above).
- Lesions in the cervix.
- Ectopy (erosion) cervix (see below).
- Procedures to take materials for Pap stain.

Q. Mention the Bethesda classification system of cytology

Ans. ■ Sample adequacy

- ◆ Satisfactory
- ◆ Unsatisfactory.

- **Squamous cell abnormalities**

- ♦ Atypical squamous cells (ASC)
- ♦ ASC of undetermined significance (ASC-US)
- ♦ ASC cannot exclude high grade lesion (ASC-H)
- ♦ Low grade squamous intraepithelial lesion (H SIL)
- ♦ Squamous cell carcinoma

- **Glandular cell abnormalities**

- **Other cancers (lymphoma, Sarcoma)**

Q. What is cervical ectopy?

Ans. It is the replacement of squamous epithelium of the ectocervix by columnar epithelium of endocervix by the process of metaplasia.

Q. What are the different types of polyps?

Ans. Polyps may be benign (mucous, fibroid or placental) or malignant. It may be sessile or pedunculated. (see p 356).

Fig. 16.4: Auvard's Self-Retaining Posterior Vaginal Speculum

Uses

- It is used as posterior vaginal wall retractor in operations like anterior colporrhaphy, vaginal hysterectomy, etc.
- It should be used only when the operation is done under general or regional anesthesia as the instrument is heavy. It requires no assistant.

Disadvantage

Prolonged use may cause perineal pain in the postoperative period.

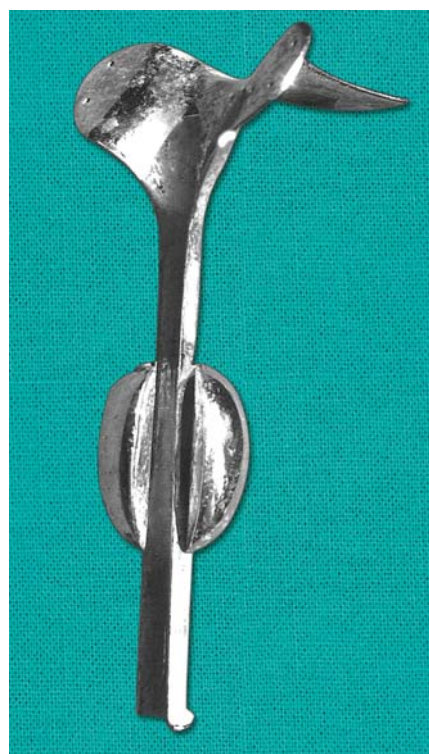


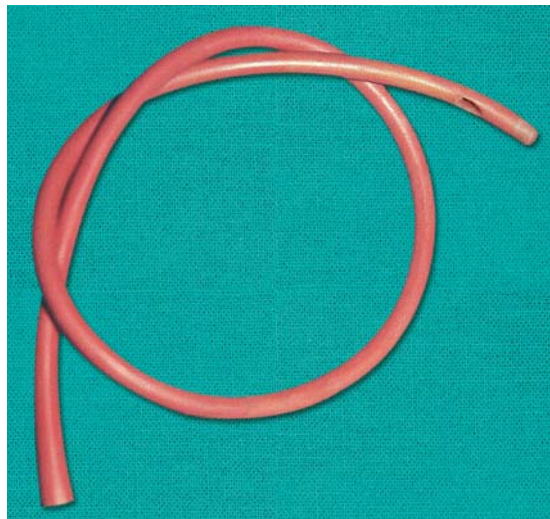
Fig. 16.4: Auvard's Self-Retaining Posterior Vaginal Speculum

Fig. 16.5: Female Rubber Catheter**Uses**

- To empty the bladder for retention of urine.
- To administer oxygen.
- To use as a tourniquet in myomectomy operation as an alternative to myomectomy clamp.

Self-assessment

- Causes of retention of urine (see below).
- **Procedure of catheterisation**—the vestibule is cleaned with a savlon swab from above downwards. The catheter is held away from the tip. It is then introduced through the external urinary meatus.

**Fig. 16.5:** Female rubber catheter**Q. What are the causes of acute and chronic retention of urine?**

Ans. (i) Postoperative (common), (ii) obstructive (vaginal packing), (iii) failure of detrusor contraction (epidural analgesia), (iv) external sphincter spasm (perineal operation) and (v) others (see page 402).

Q. What are the different causes of urinary incontinence?

Ans.

- (a) Urinary fistulae (vesical, urethral and ureteral).
- (b) Urethral sphincter incompetence (stress urinary incontinence).
- (c) Detrusor overactivity (overactive bladder).

Q. What are the different menstrual abnormalities that can manifest with retention of urine?

Ans. (see p 402)

Fig. 16.6: Female Metal Catheter**Fig. 16.6:** Female metal catheter

Uses

- To empty the bladder prior to major vaginal operations. Not only it facilitates the operation but minimizes the injury to the bladder.
- To confirm the diagnosis of Gartner's cyst from cystocele.
- It is not used in obstetrics as it may cause trauma.

Use in PFR

- To empty the bladder prior to the operation
- To note the lower limit of the bladder before making the incision on the vagina
- Prior to cutting the vesicocervical ligament
- At the end of the operation to make sure about absence of any injury.

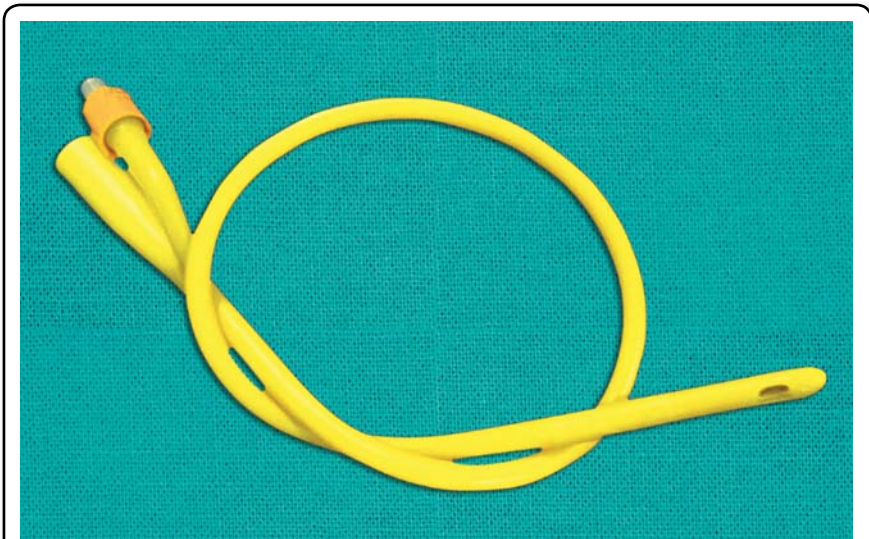
Self-assessment

- **Length of female urethra:** It measures about 4 cm.

Q. How Gartner's duct cyst could be differentiated from cystocele

Ans. Gartner's duct cyst is situated in the antero lateral vaginal wall. Margins are well defined as it is not reducible. The metal catheter tip introduced per urethra could not be easily palpated through the vaginal mucosa.

- **Management of injury to bladder during operation:** Bladder mucosa is apposed with 3-0 delayed absorbable suture (vicryl) as a continuous layer. A second layer of (musculofascial) suture with the same material is used to reinforce the first layer. Continuous bladder drainage is maintained for 10 days.

Fig. 16.7: Foley's Catheter**Fig. 16.7:** Foley's catheter

History: *Foley, Frederick Eugene Basil (1891–1966):* Frederick Foley was a neurologist in St Paul's Hospital, Minnesota. He devised a 'hemostatic bag' catheter, to provide hemostatic tamponade to the excised prostatic bed and for continuous drainage of bladder. It was originally a soft rubber catheter with a balloon sleeve of rubber around the shaft below the eye of the catheter. Currently, the catheter is made of latex which is less irritating to urethral mucosa. Frederick Foley died of lung cancer in 1966.

Use in Gynecology

- A. For continuous drainage of bladder—common indications are:
 - (a) Vaginal/abdominal hysterectomy
 - (b) Pelvic floor repair
 - (c) Following repair of VVF
 - (d) Urinary retention due to pelvic tumor
 - (e) Following radical hysterectomy.
- B. During hysterosalpingography, sonohysterosalpingography, the catheter is introduced into the uterocervical canal (transcervically), balloon is inflated to occlude the canal and then the medium (dye/saline) is pushed.
- C. To assess the patency of the fallopian tube during laparotomy, catheter is introduced in the uterocervical canal (vaginally) and the balloon is inflated then dye is pushed.

Figs. 16.8A and B: Cervical Dilators**Fig. 16.8A:** Hawkin–Ambler dilator**Fig. 16.8B:** Das's dilator**Varieties**

- Hawkin–Ambler — There are 16 sets starting from 3/6 and ending with 18/21 (Fig. 16.8A).
- Hegar's (Fig. 16.8A)—There are 12 sets, the smallest one is of 1–2 mm. This is used mainly in Gynecological operations.
- Das's dilator (named after Sir Kedarnath Das) (Fig. 16.8B).

Uses

- To dilate the cervix to facilitate intrauterine introduction of instruments (curette) or devices (IUCD) or hysteroscope or radium.
- To dilate the cervix to facilitate drainage of intrauterine collection — pyometra, hematometra or lochiometra.
- To confirm patency of cervical canal after amputation of cervix.
- To dilate the urethra in urethral stricture.

Self-assessment

Q. What are the indications of dilatation of the cervix only?

- Ans.** (a) Prior to amputation of the cervix
(b) Drainage of pyometra or hematometra
(c) Prior to hysteroscopy.

Q. What are the complications of dilatation operation?

- Ans.** (a) Injury to the cervix
(b) Uterine perforation
(c) Bowel injury (rare)

- (d) Infection
- (e) Hemorrhage.

Q. What are the indications of amputation of cervix?

Ans:

- (a) Congenital elongation of the cervix
- (b) Chronic cervicitis leading to hypertrophy and elongation of the cervix
- (c) As a component part of the Fothergill's operation.

Q. What are the causes of pyometra?

Ans:

- (a) Senile endometritis
- (b) Endocervical carcinoma
- (c) Tubercular endometritis
- (d) Infected lochiometra (obstetrical).

Fig. 16.9: Multiple Toothed Vulsellum

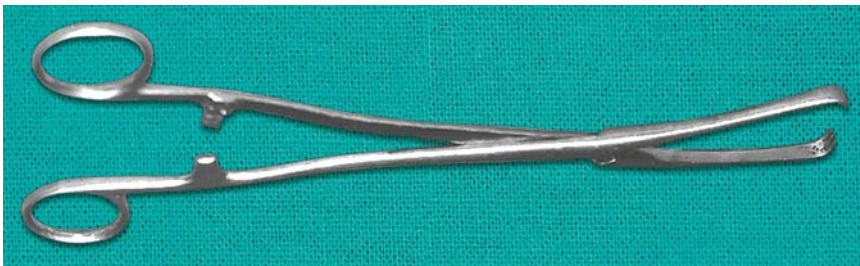


Fig. 16.9: Multiple toothed vulsellum

Uses

- To hold the parous cervical lip in operations like D + C, anterior colporrhaphy or vaginal hysterectomy. Its function is to make the cervix steady by traction.
- To remove a polyp by twisting as an alternative to Lane's tissue forceps.
- To hold the fundus of the uterus and to give traction while the clamps are placed during total abdominal hysterectomy for benign lesion.

Self-assessment

Q. Which cervical lip is to hold?

Ans. Usually the anterior lip is held in conditions like D and C, D and E, but in some conditions, the posterior lip is to be held.

Q. Indications of holding the posterior lip of the cervix.

Ans. Usually the anterior lip is held but in some conditions, the posterior lip is to be held. Such conditions are:

- (a) During amputation of cervix or vaginal hysterectomy when the posterior cervico-vaginal mucous membrane is incised.
- (b) During posterior colpotomy for drainage of pus collected in the POD.
- (c) During ligation of tubes done vaginally.
- (d) When there is growth in the anterior lip of cervix.
- (e) Culdocentesis to aspirate through the pouch of Douglas as in a case of pelvic abscess.

Fig. 16.10: Single-Toothed Vulsellum

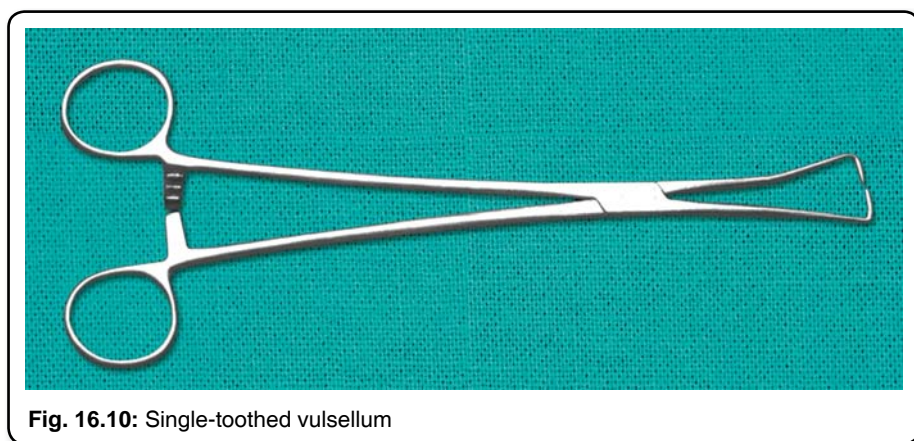


Fig. 16.10: Single-toothed vulsellum

Uses

- To hold the cervix after opening the vault of vagina and to give traction while the remaining vault is being cut in total abdominal hysterectomy.
- To hold the new cervical stump after amputation of the cervix and Fothergill's operation.
- To hold the cervical stump left after subtotal hysterectomy.
- Sometimes to hold the anterior lip of nulliparous cervix in operation of D + C. (Allis' tissue forceps preferred).

Self-assessment

- **Indications of amputation of cervix.**

(see p 430)

Q. What are the indications of subtotal hysterectomy?

Ans: Subtotal hysterectomy is done in certain situations where total hysterectomy

is found to be difficult or time-consuming. This is done particularly where there is risk of injury to the other viscera like the urinary bladder, rectum or the ureters.

The indications are:

1. Difficult tubo-ovarian mass with obliteration of the anterior and posterior pouches.
 2. Pelvic endometriosis with involvement of the rectovaginal septum.
 3. Emergency hysterectomy (rupture uterus in obstetrics).
- Common indications of abdominal hysterectomy (see p 431)
 - Indications of vaginal hysterectomy
 - ♦ Uterine prolapse in postmenopausal women
 - ♦ Uterine prolapse in perimenopausal age group with uterine pathology (DUB).
 - ♦ In non descent vaginal hysterectomy as an alternative to laparoscopic hysterectomy.
 - Indications of Fothergill's operation (see p 333)
 - ♦ Uterine prolapse where preservation of uterus of desired: (a) reproductive function, (b) menstrual function
 - Principal steps of Fothergill's operation (see p 430).
 - Complications of Fothergill's operation (see p 430).

Q. Causes of pelvic abscess.

- Ans.**
- Post abortal/Puerperal sepsis
 - Post operative pelvic peritonitis
 - Infection of pelvic hematocele.

Fig. 16.11: Anterior Vaginal Wall Retractor

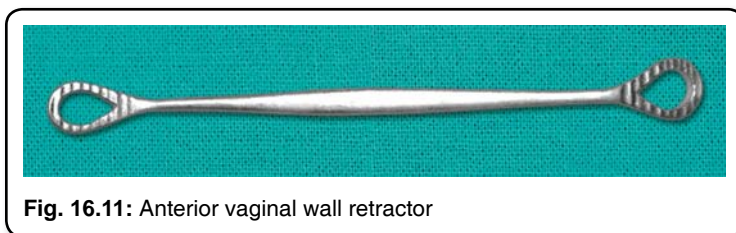


Fig. 16.11: Anterior vaginal wall retractor

Use

- To retract the sagging anterior vaginal wall, to have a good look on the cervix while retracting the posterior vaginal wall by the Sims' speculum.

Fig. 16.12: Olive Pointed Malleable Graduated Metallic Uterine Sound

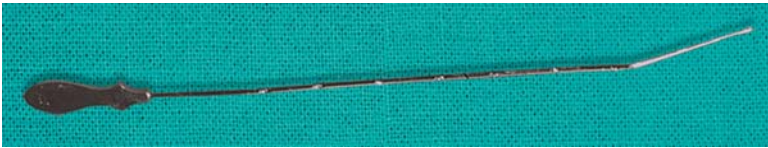


Fig. 16.12: Olive pointed malleable graduated metallic uterine sound

Uses

- To confirm the position of the uterus
- To note the length of the uterocervical canal
- It acts as a first dilator
- To sound the uterine cavity in a case of IUCD with missing threads
- To differentiate a polyp from inversion of uterus.

Self-assessment

Q. *What is the normal position of the uterus and length of the uterocervical canal.*

Ans. The normal position is of anteversion and anteflexion. The uterocervical canal measures 7.5 cm.

R. *Conditions where the length of the uterocervical canal is increased*

Ans. • Fibroid uterus, • Elongation of cervix, • Endometrial carcinoma.

Fig. 16.13: Uterine Curette



Fig. 16.13A: Sharp at one end, blunt at the other end



Fig. 16.13B: Flushing curette

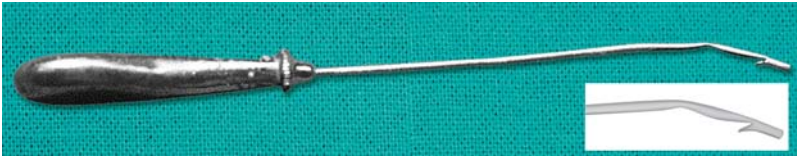


Fig. 16.13C: Sharman's curette

Fig. 16.13: Uterine curettes

Types

- ♦ Sharp at one end, blunt at the other (Fig. 16.13A)
- ♦ Sharp or blunt at both ends
- ♦ Handle with only sharp at one end
- ♦ Flushing curette (blunt) (Fig. 16.13B)
- ♦ Sharman's curette (Fig. 16.13C).

Uses

Sharp curette (Fig. 16.13A)

- Infertility
- DUB
- Tubercular endometritis.

Blunt curette

- Suspected choriocarcinoma
- Suspected endometrial carcinoma.

Flushing curette (Fig. 16.13B)

- Following D + E.

Sharman's curette (Fig. 16.13C)

- Infertility work up, where only a strip of endometrium is enough to study the hormonal reflection. It is done as an outpatient procedure and without anesthesia.

Self-assessment

Q. *What is the purpose of doing endometrial biopsy in a woman with infertility?*

Ans. To detect evidence of ovulation—by seeing the secretory changes in the endometrium.

Q. Which day of the menstrual cycle endometrial biopsy is usually done?

Ans. Biopsy should be done on D21–D23 when the cycle is regular. When the cycles are irregular, it is done within 24 hours of the menstruation.

Q. In endometrial biopsy, what is the earliest evidence of ovulation?

Ans. Subnuclear vacuolation is the earliest evidence appearing within 36–48 hours of ovulation.

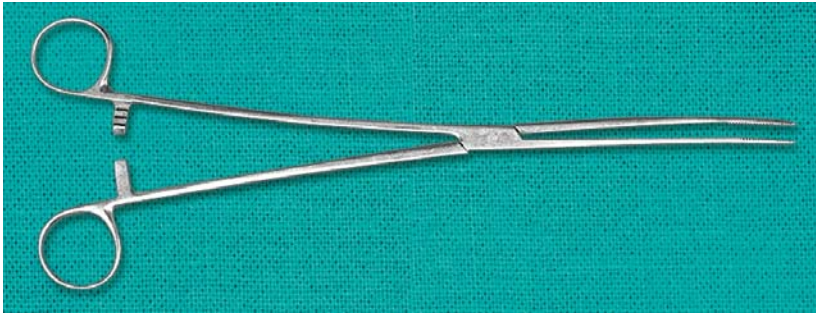
Q. What are the different methods for detection of ovulation?

Ans:

1. **Basal body temperature (BBT):** There is biphasic pattern. In ovulatory cycle there is rise in temperature.
2. **Cervical mucus study:** Disappearance of fern pattern beyond 22nd of the cycle suggests ovulation.
3. **Vaginal cytology:** Maturation index shifts to the left due to the effect of progesterone.
4. **Serum Progesterone:** A rise in serum levels of progesterone in the secretory phase of the cycle (D-21) when compared to D-8 of the cycle suggests ovulation
5. **Serum LH:** Mid cycle LH surge may predict ovulation.
6. **Sonography:** Serial sonography—to detect graafian follicle (18-20 mm) and subsequently collapsed follicle and fluid in the POD suggests ovulation.
7. **Laparoscopy:** Direct visualization of recent corpus luteum.
8. **Endometrial biopsy**—secretory changes in the endometrium is diagnostic, appearance of subnuclear vacuolation is the earliest evidence of ovulation (<48 hours).

Q. What are the ovarian causes of infertility?

- Ans.** (a) Anovulation
(b) Decreased ovarian reserve
(c) Luteal phase defect (LPD)
(d) Luteinized unruptured follicle syndrome (LUF).

Fig. 16.14: Uterine Dressing Forceps**Fig. 16.14:** Uterine dressing forceps

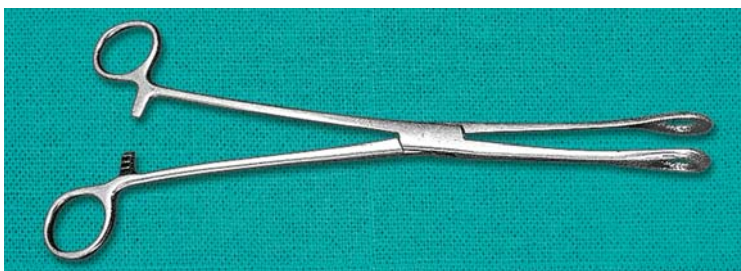
The instrument is often confused with laminaria tent introducing forceps. The blades are transversely serrated while in the latter, there is a groove on either blade.

Uses

- To swab the uterine cavity following D+E operation with a small gauze piece.
- To dilate the cervix in lochiometra or pyometra.
- To plug the uterine cavity with gauze twigs in continued bleeding after removal of polyp.

Self-assessment

- Causes of pyometra (see Dutta Gyne 6/e, p 169).
- Polyps (see p 356).

Fig. 16.15: Sponge Holding Forceps**Fig. 16.15:** Sponge holding forceps

Uses

- Antiseptic dressing before any abdominal or vaginal operation
- To clean the vagina with gauze pieces before and after vaginal operations
- To hold the cervix in circlage operation during pregnancy.

Self-assessment

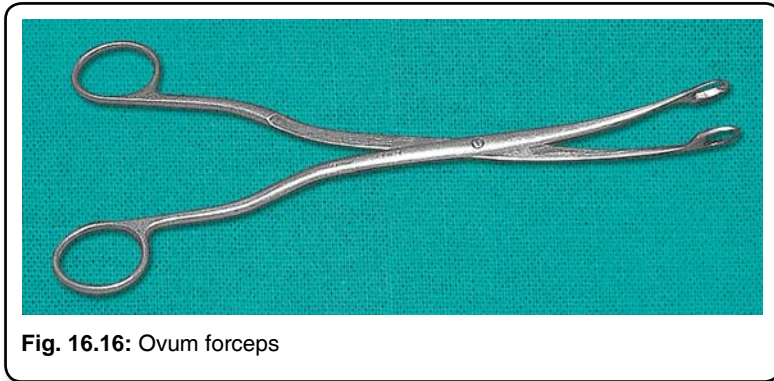
Q. Name a few common abdominal operations.

Ans. Abdominal hysterectomy, myomectomy, ovariectomy.

Q. Name a few common vaginal operations.

Ans. Pelvic floor repair, vaginal hysterectomy, Fothergill's operation.

Fig. 16.16: Ovum Forceps



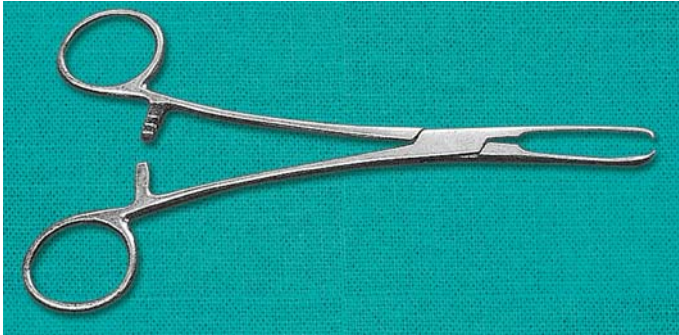
It is often confused with sponge holding forceps but it has no ratchet. As such, it minimizes trauma to the uterine wall if accidentally caught and also it has got no crushing effect on the conceptus.

Uses

- To remove the products of conception in D and E after its separation partially or completely.
- To remove molar tissue in hydatidiform mole.
- To remove uterine polyp (small).

Methods : The cervical canal is dilated first. The instrument is introduced with the blades closed and opened inside the cavity. The products are caught and then with twisting movements and simultaneous traction, the products are removed.

Dangers: It may produce injury to the uterine wall to the extent of even perforation. Not infrequently, a segment of intestine or omentum may even be pulled out through the rent.

Fig. 16.17: Allis Tissue Forceps**Fig. 16.17:** Allis tissue forceps

History: *Allis Oscar Huntington (1836–1921) was a surgeon at Presbyterian Hospital, Philadelphia, USA.*

This forceps is used to hold soft tissues for a long time with minimal tissue damage. Using the ratchet it can be locked and can be used to give gentle traction.

Uses

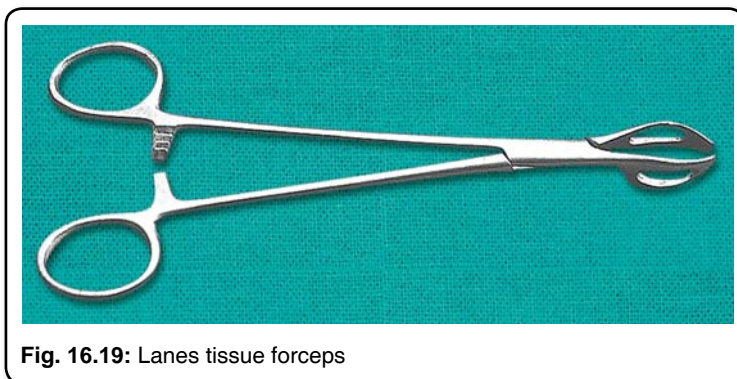
- To hold the margins of the vaginal flaps in colporrhaphy operation
- To hold the peritoneum or rectus sheath during repair of the abdominal wall
- To hold the margins of the vagina in abdominal hysterectomy
- To hold the anterior lip of the cervix in D and C operation
- To catch the torn ends of the sphincter ani externus in complete perineal tear repair
- To remove a small polyp
- To take out the tissue in wedge biopsy.

Q. *What are the common symptoms associated with genital prolapse?*

Ans. Woman may remain asymptomatic if the prolapse is mild. The common symptoms are genital organs protruding out of the vaginal opening, difficulty in walking, sitting, urination or defecation. Prolapse may interfere with sexual intercourse or may cause vaginal bleeding due to ulceration of mucosa. It may cause incontinence of urine, pelvic pressure or backache.

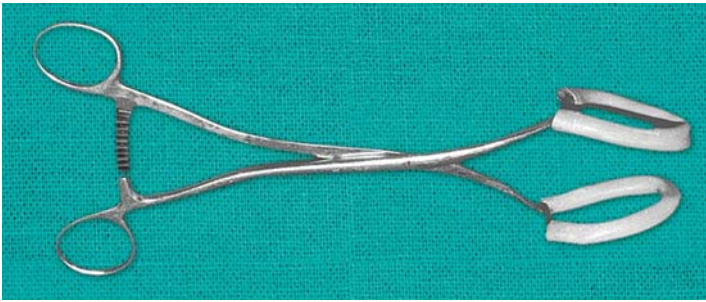
Fig. 16.18: Little Wood's Forceps

- This instrument is designed similar to Allis tissue forceps except that the blades have a smooth curvature with its concavity inwards. It has the catches at the handle. The tip has got teeth.
- Uses are similar to that of Allis tissue forceps

Fig. 16.19: Lanes Tissue Forceps

Uses

- To hold parietal wall (bulk of tough tissues) for retraction during abdominal operations with transverse incision.
- To hold the polyp or fibroid in polypectomy or myomectomy operation.
- To hold the towel during draping.

Fig. 16.20: Uterus Holding Forceps**Fig. 16.20:** Uterus holding forceps

The blades are protected with rubber tubes to minimize trauma to the uterus.

Uses

- To fix and steady the uterus when conservative surgery is done on the adnexae (tuboplasty operation).

What are the different surgical procedures for proximal and distal tubal disease?

Procedures are:

1. Proximal tubal block: Hysteroscopic cannulation.
2. Distal tubal block: Fimbrioplasty, fimbriolysis, or neosalpingostomy.

Fig. 16.21: Cervical Occlusion Clamp**Fig. 16.21:** Cervical occlusion clamp

The blades are guarded with rubber tubes to avoid trauma to tissues.

Uses: Evaluation of tubal patency during laparotomy (following tuboplasty). Cervix is occluded with the instrument and methylene blue dye is injected into the uterine cavity through the fundus using a syringe and a needle.

Self-assessment

Q. What are the different methods to assess tubal patency?

Ans. • Dilatation and insufflation test (D and I) not commonly done

- Hysterosalpingography (HSG)
- Laparoscopy and chromopertubation
- Sonohysterosalpingography
- Falloposcopy
- Salpingoscopy.] not usually done

Q. What are the different types of tubal reconstructive surgery?

Ans. **Types of tuboplasty operations are:**

1. Adhesiolysis
2. Fimbrioplasty
3. Salpingostomy
4. Tubotubal anastomosis
5. Tubocornual anastomosis.

Fig. 16.22: Myoma Screw

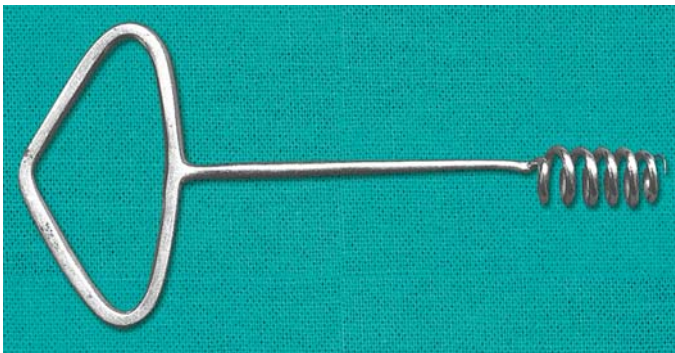


Fig. 16.22: Bonney's myoma screw

Uses

- To fix the myoma after the capsule is cut open and to give traction while the myoma is enucleated out of its bed (myomectomy).
- To give traction in a big uterus (multiple fibroid) requiring hysterectomy while the clamps are placed.

Self-assessment

- Principle of myomectomy: It is the enucleation of myoma from the uterus. The uterus is preserved for future reproductive or menstrual function.
- Complications of myomectomy (see p 438).
- Important considerations before myomectomy (prerequisites of myomectomy)
Submucosal polyp, submucous fibroid, any tubal block or endometrial carcinoma should be excluded before performing myomectomy.

History: Bonney, William Francis Victor (1872-1953): Gynecologist at the Middlesex and Chelsea Hospitals, London. He is mostly remembered for his conservative surgery for fibroids (myomectomy). His contributions in gynecology are many. The significant ones are:

- (a) Bonney's myomectomy screw (Fig. 16.22)
 - (b) Bonney's myomectomy clamp (Fig. 16.23)
 - (c) Bonney's hood myomectomy (Dutta Gyne 6/e, p 604)
 - (d) Bonney's test: Elevation of bladder neck during vaginal examination (not currently practised).
 - (e) Bonney's Gynecology Surgery: Textbook on Operative Gynecology
- Unfortunately before he pioneered myomectomy, his wife had subtotal hysterectomy due to fibroid uterus

Fig. 16.23: Bonney's Myomectomy Clamp

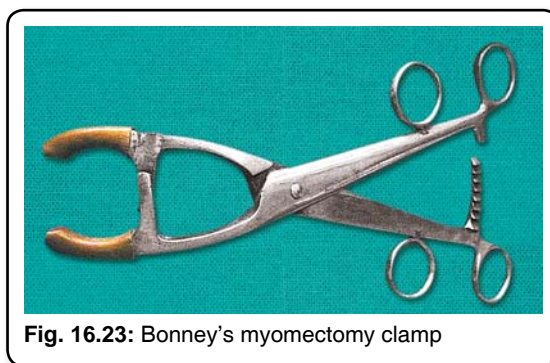


Fig. 16.23: Bonney's myomectomy clamp

Uses

- The clamp is used in myomectomy operation. It curtails the blood supply to the uterus temporarily, thereby minimizing the blood loss during operation. Simultaneous, bilateral clamping of the infundibulopelvic ligaments by rubber-guarded sponge holding forceps may be employed.

- This clamp is seldom used nowadays and is being replaced by—(a) preoperative use of GnRH analogue. (see p 438), (b) intraoperative use of tourniquets (see p 438), (c) vasoconstrictive agents (vasopressin)
- The instrument is placed at the level of internal os with the concavity fitting with the convexity of the symphysis pubis. The round ligaments of both sides are included inside the clamp to prevent slipping of the instrument and preventing the uterus from falling back. The clamp is removed after suturing the myoma bed but before closing the peritoneal layers.

Fig. 16.24: Hysterosalpingography Cannula (Leech Wilkinson Variety)

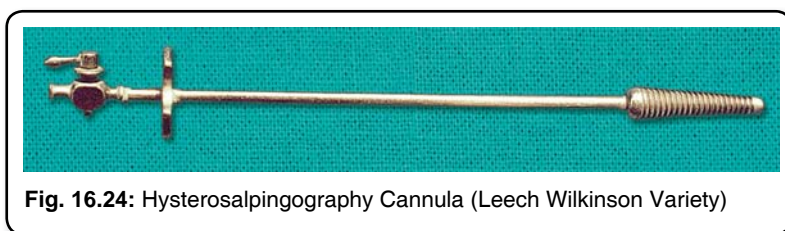


Fig. 16.24: Hysterosalpingography Cannula (Leech Wilkinson Variety)

In HSG, a syringe is required to push the dye. Iodine-containing radio-opaque dye (urograffin) is used. It is done in the radiology department without anesthesia.

Uses

- Hysterosalpingography (HSG)
- It is also used for hydrotubation

Hydrotubation—Medicated solution is pushed transcervically in conditions such as following tuboplasty operation, to restore tubal patency or in cases with suspected flimsy adhesions in the tubal lumen or in the fimbria. The drugs instilled are—dexamethasone 4 mg with gentamicin 80 mg in 10 ml normal saline. It should be instilled in the proliferative phase for at least 3 cycles.

Self-assessment

Q. What is HSG?

Ans: It is a radiographic study to assess the interior anatomy of the uterus, cervical canal and the tube.

Q. When HSG should be done?

Ans: HSG is done between D7 and D10 of the cycle.

- **Advantages of HSG over laparoscopy**
(see SAQ-3 on p 382).

Q. How do you compare the oil-based versus water-based media used in HSG?

Ans. Water-based media is commonly used. It causes less cramping pain and discomfort. Oil-based media gives better image and has higher pregnancy rates. Granuloma is more with oil-based media. Embolization is minimal with either media.

Q. What are the indications of HSG?

Ans. To assess tubal patency.

Q. Advantages of HSG over laparoscopy.

Ans. To detect uterine malformation.

To detect uterine synechiae.

Q. What are the complications of HSG?

Ans.

1. Pelvic pain
2. Vagovagal attack
3. Dye intravasation within the venous or lymphatic channel
4. Flaring up of pelvic infection.

Q. What are the contraindications of HSG?

Ans.

1. Pelvic infection
2. Presence of adnexal mass (PID)
3. Pelvic tenderness on pelvic examination

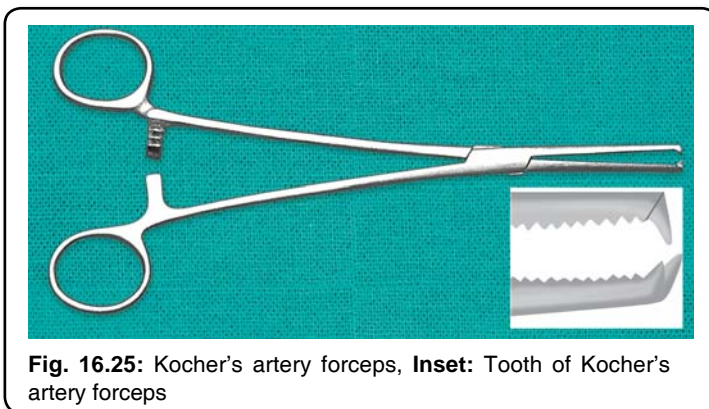
Q. What are the other alternatives to HSG?

Ans. Diagnostic laparoscopy and dye test; sonohysterosalpingography and insufflation test (see p 399).

Q. What is sonohysterosalpingography?

Ans. It involves instillation of saline in the uterine cavity to study the uterine cavity and the tubes with trans vaginal sonography. Uterine polyp and submucous fibroid is better diagnosed with this method.

Fig. 16.25: Kocher's Artery Forceps



Use

- To use as a clamp in hysterectomy operation.

Self-assessment

Q. What added advantage it has got?

Ans. Due to the presence of tooth, it gives a firm grip to the pedicle hold.

- Indications of abdominal hysterectomy (see p 431).
- Mention the different sites where the clamps are placed in total abdominal hysterectomy (see p 432).
- Principal steps of Fothergill's operation (see p 430).
- Complications of Fothergill's (see p 430).

Fig. 16.26: Landon's Bladder Retractor

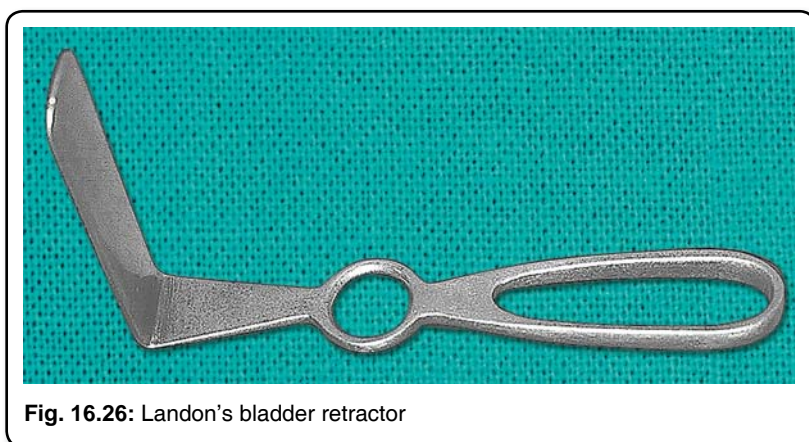


Fig. 16.26: Landon's bladder retractor

Uses

- In vaginal hysterectomy.
- To keep the bladder up, to facilitate opening of the uterovesical peritoneum.
- To introduce it through the opening of the uterovesical pouch and to retract the bladder while the clamps are placed. This prevents injury to the bladder.
- To inspect the suture lines after completion of vaginal plastic operations by retracting the anterior or posterior vaginal wall.
- Intravaginal plugging can be done under its guidance.
- To use as lateral vaginal wall retractor.

Self-assessment

Q. What are the nonsurgical treatments of prolapse?

Ans. Conservative treatments include: (i) to avoid aggravating factors (obesity, chronic cough, constipation) (ii) pelvic floor exercise, (iii) Estrogen replacement therapy, (iv) pessary in some cases

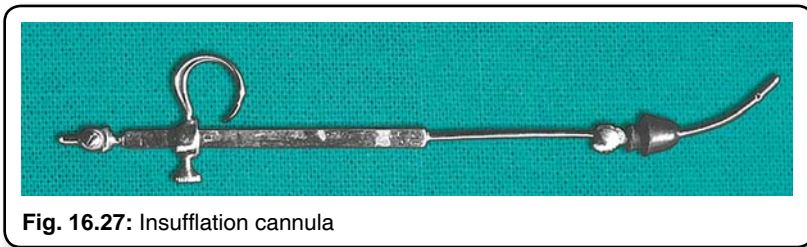
Q. *Mention the different sites where the clamps placed during vaginal hysterectomy*

Ans. (see p 441).

Q. *Important postoperative complications following vaginal hysterectomy with PFR*

Ans. (see p 442).

Fig. 16.27: Insufflation Cannula



The instrument is not complete. It requires a 'Y' rubber tube. One end is attached to a bulb and the other end to a manometer.

Use: To know the patency of the tubes in infertility investigation or following tuboplasty.

Self-assessment

■ Ideal time of operation

It is done in the early proliferative phase, usually 2 days after the menstrual bleeding stops.

■ Complications

- ♦ Flaring up of pelvic infection
- ♦ Shoulder pain.

Q. *What are the advantages of HSG over D and I ?.*

- Ans:** (i) HSG can precisely detect the side and the site of block in the tube
 (ii) Additionally it can reveal any abnormality in the uterus
 (iii) D and I can be false-negative also.

Figs 16.28A to C: Abdominal Retractors

Retractors are used to retract tissues out of the operative field. This is needed for better exposure during surgery. Retractors are held in place either by an assistant (**manual retractor**) or by counter pressure with some device (**self-retaining retractor**). Manual retractor can be used alone or in combination with a self-retaining retractor. A pack may be placed between the viscera and the retractor to avoid direct trauma to the viscera.

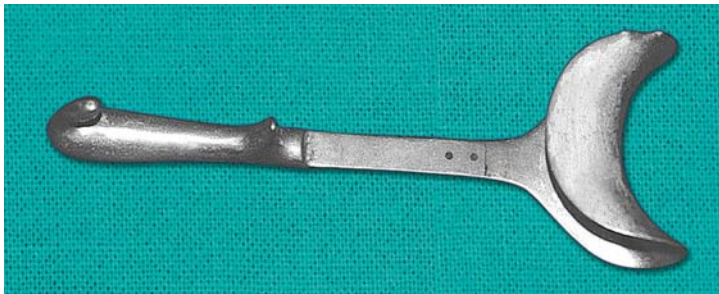
Doyen's retractor (Fig. 16.28A)

Fig. 16.28A: Doyen's abdominal retractor

Use

- To retract the abdominal wall in abdominopelvic surgery to expose the field of operation.
- As an alternative, self-retaining retractor may be used.

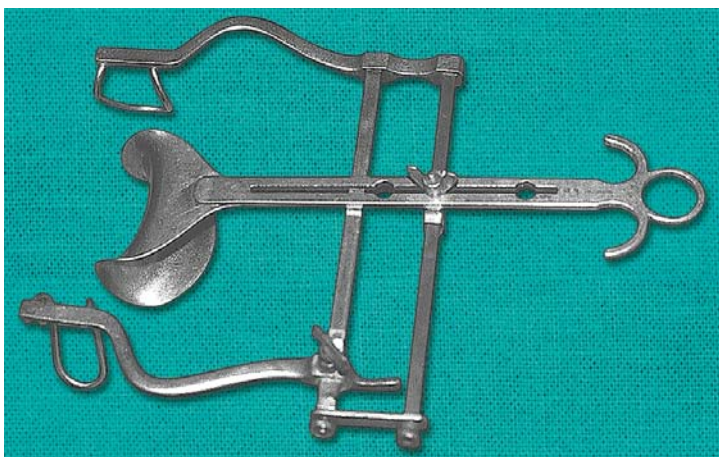
Balfour self-retaining retractor (Fig. 16.28B)

Fig. 16.28B: Balfour self-retaining retractor

Two lateral blades and an additional (third) blade. All the blades are detachable and may be of different sizes.

Uses

- To retract the abdominal wall all around.
- To expose the field of operation widely (no assistant is needed for manual retraction).

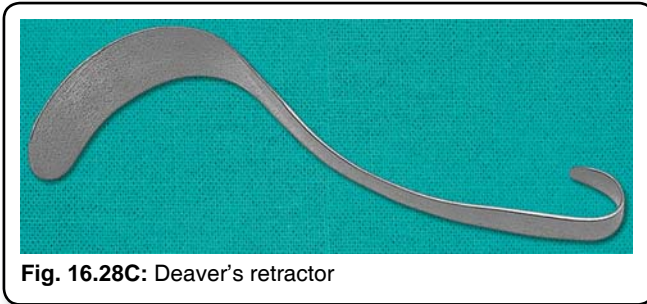
Deaver's retractor (Fig. 16.28C)

Fig. 16.28C: Deaver's retractor

History: *Deaver John Blair (1855-1931) was Professor of Surgery at University of Pennsylvania Medical School, Philadelphia, USA*

It is a manual retractor either used alone or in combination with a self-retaining one. It has got different sizes.

Uses

- It is used in abdominal operation to retract the viscera as and when required in order to facilitate the operative procedures like abdominal hysterectomy. For that purpose, it may also be used as a lateral retractor.
- To retract the parietal wall during abdominopelvic surgery (hysterectomy).
- To retract the bladder and intestines during the surgery.

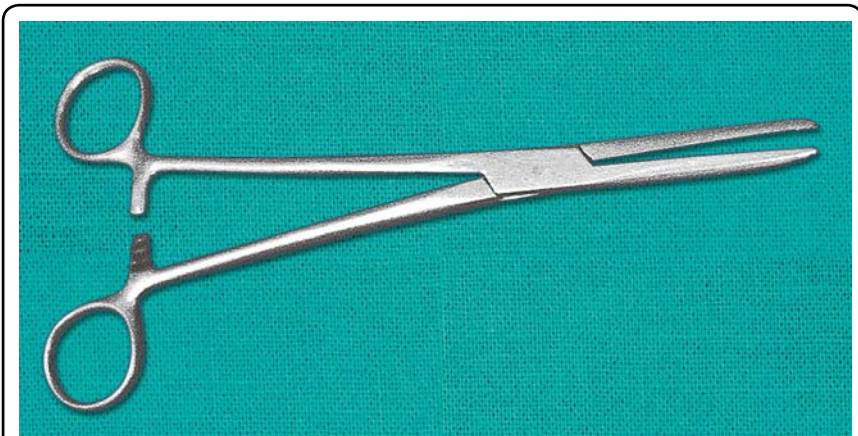
Fig. 16.29: Long Straight Hemostatic Forceps (Spencer Wells Clamps)

Fig. 16.29: Long straight hemostatic forceps (Spencer Wells Clamps)

History: *Sir Spencer Wells Thomas (1818–1897) was a Surgeon at the Samaritan Free Hospital for Women and Children, London (UK). He devised the clamp to place across the ovarian pedicles. He established himself as the most prolific ovariectomist of his era. In 1884 he was elected the President of Royal College of Surgeons.*

Uses

- It is used as a clamp in hysterectomy, salpingectomy or salpingo-oophorectomy operation.
- To catch a bleeding vessel for hemostasis deep into the pelvis.

Self-assessment

- Pedicles held in total abdominal hysterectomy (see p 432).

Q. What are the indications of salpingectomy?

Ans. (i) Tubal ectopic pregnancy, (ii) Hydrosalpinx and (iii) pyosalpinx

Q. What is salpingo-oophorectomy?

Ans. It is the surgical procedure of removing the tube and the ovary.

Q. How is the procedure done?

Ans. Paired clamps are placed on the infundibulopelvic ligament on the lateral side and another paired clamps are placed medially over the medial end of the fallopian tube including the ovarian ligament and the mesosalpinx. The clamp tips are to be approximated. The pedicles are cut in between the clamps. The clamps are replaced by transfixation sutures. Long straight spencer Well's Clamps are commonly used.

Q. What are the pedicles held in vaginal hysterectomy?

Ans. (see p 441).

Q. What are the pedicles held during salpingo-oophorectomy?

Ans. (see p 432).

Q. What are the complications of abdominal hysterectomy?

Ans. (see p 432).

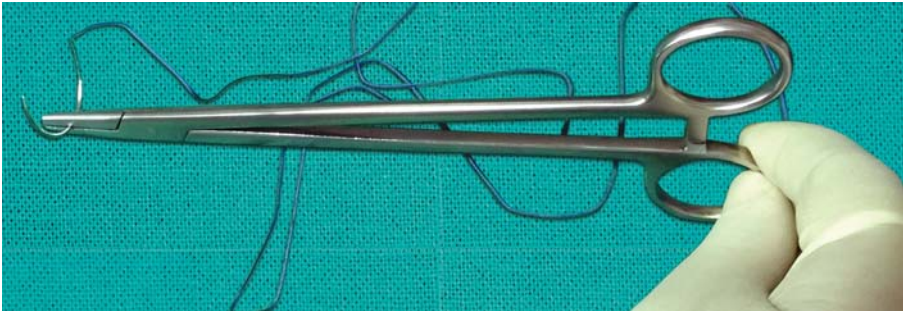
Fig. 16.30: Babcock's Forceps



Fig. 16.30: Babcock's forceps

Uses

- To hold the fallopian tube in tuboplasty operation.
- To hold lymph glands during dissection in radical hysterectomy (lymphadenectomy).
- To hold the appendix during appendicectomy.

Fig. 16.31: Needle Holder**Fig. 16.31:** Needle holder with needle and suture**Uses**

- It may be straight or curved.
- To catch-hold the needle. The needle should be caught at the junction of anterior 2/3rd and posterior 1/3rd.

Fig. 16.32: Barkelay Bonney Vaginal Clamp**Fig. 16.32:** Barkelay Bonney vaginal clamp**Use**

- To occlude the vaginal canal prior to cutting the vagina in Wertheim's hysterectomy.

Fig. 16.33: Punch Biopsy Forceps**Fig. 16.33:** Punch biopsy forceps

Uses

- To take biopsy from the cervix.
- The biopsy is taken as an outdoor procedure without anesthesia. The site of biopsy is either from the suspected area or Schiller's iodine or colposcopic directed.

Self-assessment

Q. What are the different types of cervical biopsy?

Ans. Types are:

- (a) Surface biopsy (smear)
- (b) Punch biopsy

Other biopsies are:

- (a) Wedge biopsy
- (b) Ring biopsy
- (c) Cone biopsy

Q. How to send the tissue for histology?

Ans. This tissue is sent for HPE in a container with normal saline labelled properly.

Q. What is Schiller's test?

Ans. Cervical biopsy is taken following application of Schiller's (0.3%) iodine solution. Punch biopsy is taken from the unstained area.

Q. What is VIA?

Ans. Visual inspection (of the cervix) following application of acetic acid. Women having acetowhite areas on the cervix are considered for colposcopic examination and/or biopsy.

Q. What are the different histological types of carcinoma cervix?

Ans. (a) Commonest—squamous cell carcinoma (80–90%)

- (b) Adenocarcinoma (10–15%)
- (c) Remaining are—clear cell, adenosquamous, neuroendocrine tumors or sarcomas.

Q. What are the complications of cervical biopsy?

- Ans.** (a) Hemorrhage (primary or secondary). Cone biopsy has got more complications.
- (b) Cervical incompetence.
 - (c) Infertility.
 - (d) Cervical stenosis.
 - (e) Vaginal discharge.
 - (f) Infection.

Figs 16.34A and 16.34B: Dissecting Forceps

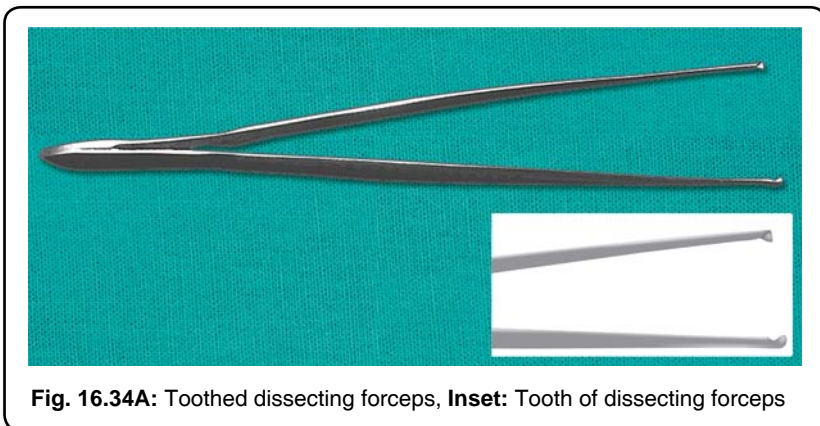


Fig. 16.34A: Toothed dissecting forceps, **Inset:** Tooth of dissecting forceps

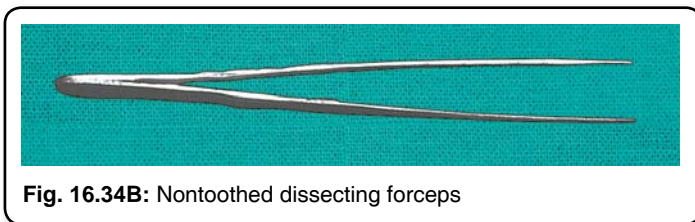


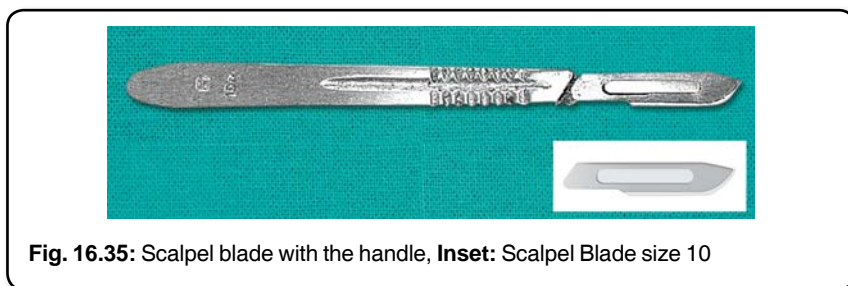
Fig. 16.34B: Nontoothed dissecting forceps

Toothed

Use: To hold tough structures like rectus sheath, cut margins of vaginal vault or margins of vaginal flaps in pelvic floor repair or the skin margins during suturing.

Plain or non-toothed

Use: To hold soft tissues like peritoneal margins during suturing.

Fig. 16.35: Scalpel Blade With The Handle**Fig. 16.35:** Scalpel blade with the handle, **Inset:** Scalpel Blade size 10

The instrument is detachable—Handle and blade. Scalpel blades are of various sizes and shapes. The available sizes are 10, 11, 12, 15, 20 and 22. Size 10 is commonly used as it is most versatile. Size 11 is used to perform stab incision for making laparoscopic point incision.

Uses

- To cut the abdominal wall—Skin, subcutaneous tissue, rectus sheath and opening the peritoneum.
- To cut the mucous coat in vaginoplasty operation and to cut tissues during surgery.
- To cut pedicles during hysterectomy.

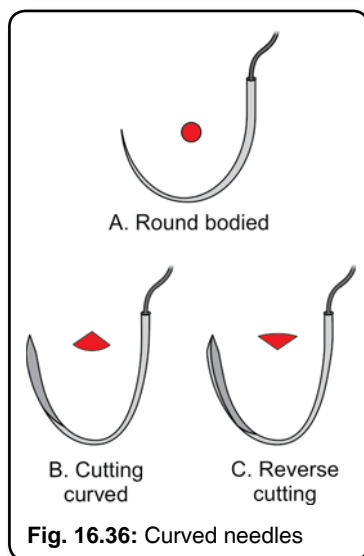
Fig. 16.36: Needles

Surgical needles have three areas: The eye, the body and the point. The needles are made of stainless steel. The needles may be eyed or eyeless. Eyeless (atraumatic) needles are swaged. The body of the needles may be curved or straight. The disadvantages of eyed needles are—difficulties in threading and the tissue trauma. **Reverse cutting** needle has an additional sharp edge on the outside. Curved needles may be 1/2 circle (1/2 of a full circle) or 3/8 circle.

Round bodied (curved)

It is used while suturing soft structures like:

- Peritonization and suturing muscles.
- Suturing the pedicles in hysterectomy.
- Suturing the pubocervical fascia.
- Tubectomy or salpingectomy.

**Fig. 16.36:** Curved needles

Cutting (curved): It is used while suturing tough structures like:

- Suturing the vaginal margins in PFR.
- Closure of the vaginal vault in abdominal hysterectomy.
- Repair of the rectus sheath.
- Suturing the skin.

Figs 16.37 to 17.39: Scissors

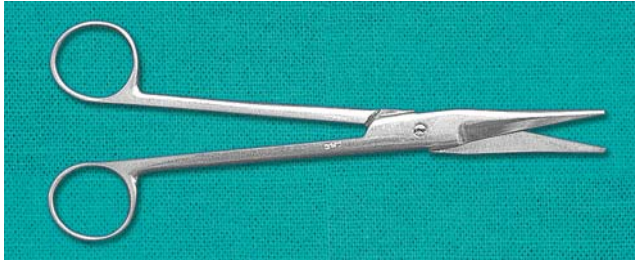


Fig. 16.37: Scissors (Mayo's type): This is used in almost every operation requiring tissue dissection and excision.



Fig. 16.38: Scissors (Bent on flat—Bonney Type): This is used conveniently in anterior colporrhaphy to dissect the vesicovaginal space and also for tissue dissection.



Fig. 16.39: Scissors (Metzenbaum): This is used for tissue dissection

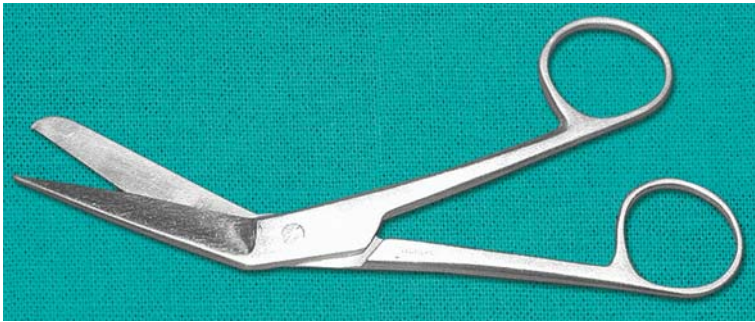


Fig. 16.40: Scissors (perineorrhaphy): It is comfortably used in perineorrhaphy operation; also used in episiotomy.

Self-assessment

Q. What are the indications of perineorrhaphy?

- Ans.**
- Relaxed perineum
 - Rectocele
 - Enterocele.

Q. What are indications of pelvic floor repair (PFR)?

- Ans.** Cystocele, rectocele and relaxed perineum.

Q. What are the complications of PFR?

Ans. A. Operative:

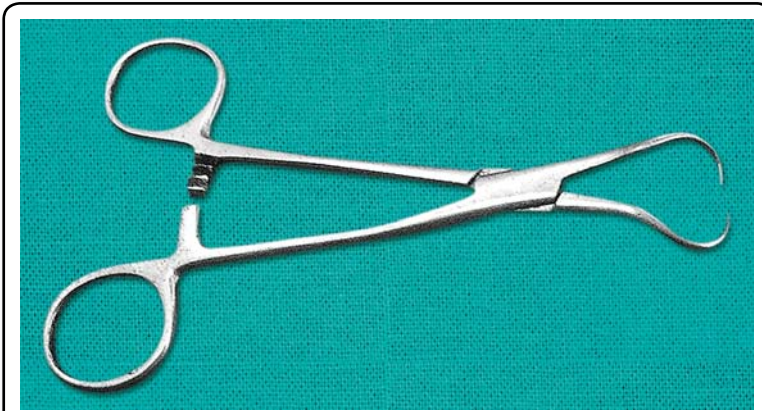
- Hemorrhage
- Injury to bladder, urethra, rectum, VVF or RVF

B. Postoperative:

- Urinary retention
- Infection – cystitis

Late:

- Dyspareunia
- VVF
- RVF
- Recurrence of prolapse
- Principal steps of perineorrhaphy, PFR and CPT repair.

Fig. 16.41: Towel Clips**Fig. 16.41:** Towel clip**Use**

- These are used in draping the operative area—abdominal or vaginal. The towels or sheets are fixed to the skin and each other with these clips.

Self-assessment

Q. *How antiseptic cleaning is done before any abdominal or vaginal operation?*

Ans. Antiseptic cleaning is done using povidone iodine 7.5% solution or Savlon (chlorhexidine) solution.

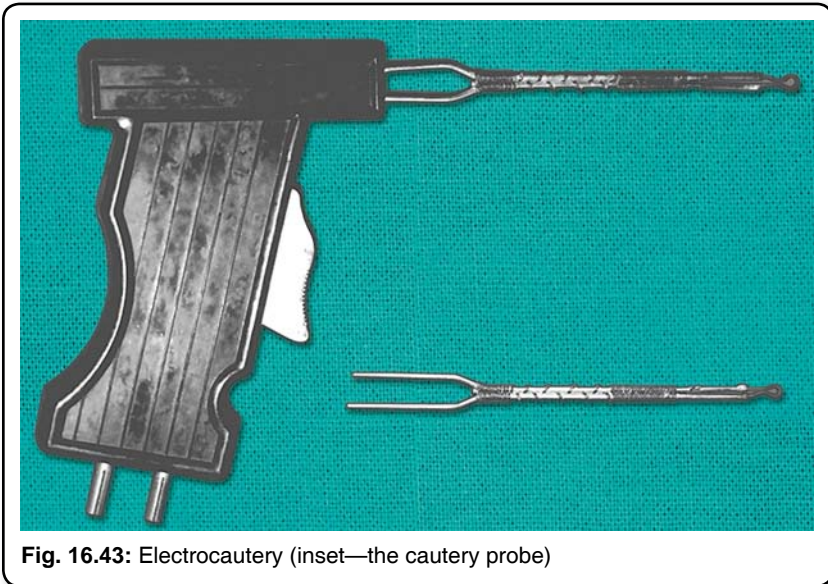
Fig. 16.42: Loop Hook**Fig. 16.42:** Loop hook

Use: To remove IUCD from the uterine cavity when the threads are missing.

Method of use: Cervical canal is dilated if needed. The hook is introduced within the uterine cavity. The IUCD is felt and is grasped within the hook. It is then pulled out.

Precautions: Location of the IUCD within the uterine cavity must be confirmed. Trauma (perforation) to the uterus is to be avoided. Hysteroscopic removal can also be done.

Fig. 16.43: Electrocautery



Use: Thermal cauterization of the cervix for cervical ectopy (erosion).

Self-assessment

Q. Mention the steps of thermal cauterization?

Ans. Radial strokes are made to burn the epithelium of the ectopy area. The strokes are made about 2 mm deep and at a distance of 1 cm.

Q. How tissue healing occurs?

Ans. The burn area sloughs out. Re-epithelialization occurs by growth of squamous epithelium.

Q. How the patient is counseled for the postoperative care?

Ans. Patient is counseled about the serosanguinous discharge for about 2–3 weeks. Thereafter it heals with the epithelialization by squamous epithelium.

Q. What are the complication of the procedure? :

Ans. Excessive vaginal discharge, slight vaginal bleeding and pelvic pain.

Fig. 16.44: Hodge-Smith Pessary

It is made up of vulcanite or ebonite. It is sterilised by keeping it in lysol for 24–48 hours.

Indications of use:

- Puerperal retroversion of the uterus
- Retroversion in early pregnancy
- Pessary test to relieve symptoms of retroversion.

Contraindications:

- **Fixed retroversion of uterus**
- **Presence of infection.**

Self-assessment: How to determine the size of a pessary?

Method of insertion: The patient lies in dorsal position with an empty bladder. The pessary is held collapsed or folded to make the insertion easy. A lubricant may be used. It is introduced inside the vagina and is pushed high. The broad end lies in the posterior fornix, the narrow end behind the symphysis pubis and the concavity is directed upwards.

Instructions to the patient:

- To have vaginal douche at least twice a week.
- To check after 1 month.
- To be removed or reintroduced after 3 months.

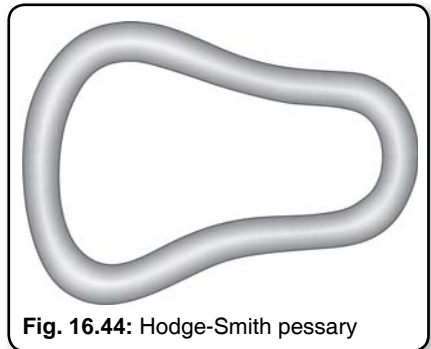


Fig. 16.44: Hodge-Smith pessary

Fig. 16.45: Ring Pessary

It is made up of watch-spring with rubber. It is sterilized by boiling for half an hour.

Uses:

- Prolapse in early pregnancy—It is kept for 18 weeks.
- Prolapse in puerperium.
- Prolapse in a woman who is unfit surgery.

Contraindications of use:

- Presence of sepsis
- Gross relaxation of pelvic floor muscles.

Measurements: As in Hodge-Smith pessary.

Instructions: As in Hodge-Smith pessary.

Self-assessment:

- Indications of pessary (see p 332).
- Mechanism of action: Pessary cannot cure prolapse. It relieves symptoms by stretching the hiatus urogenitalis. Thus it prevents vaginal and uterine descent.



Fig. 16.45: Ring pessary

PROCESSING OF INSTRUMENTS

A. Disinfection is done by any one of the methods: Immersing instruments in:

- (i) Boiling water for 20 minutes
- (ii) 2% glutaraldehyde (cidex) solution for 20 minutes
- (iii) 0.5% chlorine solution for 20 minutes (0.5% of chlorine solution is made by adding 3 teaspoons (15 gm) of bleaching powder in one liter of water).

B. Cleaning: Instruments are disassembled and washed from all surfaces in running (preferably warm) water. The cannulas should be flushed repeatedly.

C. Sterilization: Either by

- (i) Autoclaving at 121°C (250°F), under pressure of 15 lbs/in² (106 kPa) for 30 minutes
- (ii) Immersing in 2% glutaraldehyde (cidex) solution for 10 hours.

SUTURE MATERIALS

The suture materials used in a particular surgical step depend on the strength of the tissues to be sutured and the time required for the wound to regain its strength. Depending on diameter, sutures are categorized into no. 0, 1, 2, etc. Sutures when smaller than no. 0, are indicated as 1-0, 2-0 and so forth. Due considerations also to be given on tensile strength of the suture, the rate at which the suture material loses its strength in vivo and the interaction expected between suture and tissues.

Classification: The suture materials may be classified either as absorbable or non-absorbable. Their biological origin or synthetic preparations are mentioned briefly.

• **Absorbable**

• **Nonabsorbable**

Absorbable: (Natural)

• **Biological**

• **Synthetic**

Biological:

• **Catgut and collagen**

Sutures: Sutures may be **monofilament** (Dexon, PDS, nylon) or **polyfilament** (vicryl, silk). It is based on the number of fiber strands. Monofilament (single stranded fiber) sutures need 5 to 6 throws to make knots secured. Polyfilament sutures are braided and their knots are secured with usual (2 to 3) throws. Risks of infection are high with polyfilament sutures. However the tensile strength of polyfilamentsuturers is high.

The catgut (derived from the word kitgut—strings of a musical instrument known as kit) is obtained from the submucosa of sheep or ox intestines. Collagen is derived from ox Achilles tendon. Both are available in plain and chromic form. Treatment with chromic sulfate produces chromic catgut and the untreated material produces plain catgut. Chromic catgut is degraded and phagocytosed by proteolytic enzymes of white blood cells (inflammatory cells) slowly. Chromic catgut loses half of its tensile strength by 10 days and maintains some strength upto 21 days. Plain catgut loses 70% of its tensile strength by 7 days.

Synthetic

• *Dexon*

Dexon (polyglycolic acid) is a copolymer of glycolic acid and is degraded by hydrolysis with minimal inflammation. It loses half of its tensile strength in 15 days and is absorbed in 4 months.

• *Vicryl (coated)*

Vicryl (polyglactin) It is a copolymer of lactide and glycolide. It loses its tensile strength in 30 days. It is absorbed by 70 days. It produces less tissue reaction than catgut.

Vicrylrapide (coated): It is also a polyglactin suture. It is similar to plain catgut. Absorption is rapid with minimal tissue inflammation. Seventy percent of its tensile strength is lost by 7 days. It is used for soft tissues, episiotomy repair and skin.

The tensile strength of the above sutures is much greater than that of catgut. But these sutures need more throws to secure knots compared to catgut.

- **Polydioxanone suture (PDS)** is a pliable monofilament made of polydioxanone. It loses half of its tensile strength in 28 days. Tissue inflammation is minimal. Monofilament sutures have no interstices to lodge any bacteria. So infections are rare. **Polyglyconate sutures** have got similar properties. These are used for fascial closure.

| SUTURES | | | | |
|---------------------|------------------|---------------|---------------------|---|
| Nature | Type | Wound Support | Complete Absorption | Tissue where used |
| Absorbable | • Plain catgut | 7-10 days | 4-8 weeks | • Subcutaneous tissue and its blood vessels |
| | • Chromic catgut | 3 weeks | 8-12 weeks | • Vascular pedicle, vaginal wall, rectus sheath |
| Delayed absorbable: | • Dexon | 3 weeks | 8-12 weeks | • Subcuticular, • Fascial structure • Skin |
| | • Vicryl | 3-4 weeks | 8-10 weeks | • Microsurgery • Vaginal vault, |
| | • PDS | 6-7 weeks | 4-6 months | • Rectus sheath • Uterine muscles |
| | • Vicryl Rapide | 7-10 days | 5-6 weeks | • Episiotomy, Subcuticular tissues |
| Non-absorbable | • Nylon | | | • Skin herniorrhaphy |
| | • Prolene | | | • Herniorrhaphy, • Rectus sheath |
| | • Silk | | | • Skin of the abdomen, • Ligation of internal iliac artery. |
| | • Dacron | | | |

All the synthetic absorbable materials are sterilized by ethylene oxide.



Fig. 16.46: Vicryl rapide 2-0 suture, length 90 cms with round bodied needle, 36mm, half circle

Nonabsorbable: • Biological • Synthetic.

Biological

- **Silk** suture can be handled and tied easily. It has excellent knot security. It is sterilized by gamma radiation. It is a foreign protein and initiates strong inflammatory response and loses half of its tensile strength by 1 year. It should not be used in contaminated or infected tissue.
- **Cotton** is the weakest nonabsorbable suture. It loses 50% of the tensile strength by 6 months. Wet cotton is stronger (10%) than dry cotton. It is rarely used now.

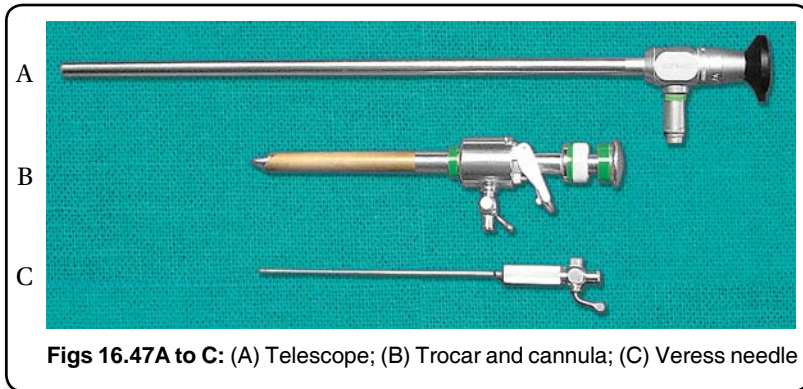
Synthetic

- **Terelene or dacron**—These are extruded from a homopolymer.
- **Polyamide (nylon)**—This is a man-made monofilament or multifilament. It is very much nonreactive in tissues. Monofilament nylon has greater tensile strength, incites less tissue reaction and is less prone to infection than braided nylon.
- **Polypropylene (prolene)** is a hydrocarbon polymer and is monofilament. It has least tissue reaction. Knot security is greater. It is sterilized by ethylene oxide.
- **Steel** suture is nonreactive and has highest tensile strength. It is not commonly used now in obstetrics and gynecology. This is used in orthopedic and dental surgery.

Nonabsorbable sutures maintain their tensile strength for a long time. However, there may be suture related pain or rarely sinus formation.

INSTRUMENTS USED FOR ENDOSCOPIC SURGERY

Fig. 16.47: Laparoscopic Instruments



A. Telescope: Rigid telescopes are used with rod lens system. Calliber varying from 4 to 12 mm. Angle of view may be either straightforward (0°) or oblique (30°) (Fig. 16.47A).

B. Trocar and cannula.

C. Veress needle

The Veress needle consists of a spring loaded blunt perforated trocar within a sharp cannula. Resistance allows the sharp cannula to protrude but when the resistance disappears, the blunt trocar protrudes out. This prevents injury to the viscera (Fig. 16.47B and C).

Use: It is used in laparoscopy operation to produce pneumoperitoneum. The common site of puncture is through a small incision made in the lower rim of the umbilicus.

Fig. 16.48: Trocar And Cannula

The instrument is introduced through the same infraumbilical incision through which Veress needle is passed at an angulation of 45° towards the pelvis.

After its introduction, trocar is withdrawn and the telescope is introduced. It is then attached to the cold light source

Self-assessment

- Indications of laparoscopy (see p 454).



Fig. 16.48: Cannula and trocar — separated

- Complications

(see p 455).

- Distension media used.

Ans. Carbon dioxide gas is commonly used.

- Advantages and disadvantages of laparoscopic sterilisation operation over conventional methods

(see p 465).

Q. Discuss briefly the Pneumoperitoneum?

Ans. Pneumoperitoneum is created with a specially designed needle called Veress needle. It is introduced into the peritoneal cavity making a small incision (1.25 cm) below the umbilicus. Abdomen is inflated with about 1–4l of carbon dioxide gas. Intraperitoneal pressure should not increase >20 mmHg.

Q. Why CO₂ is preferred for the creation of pneumoperitoneum?

Ans. a) CO₂ is a gas soluble in blood and is rapidly absorbed
b) Risk of embolism is less
c) It does not support combustion when electrodathermy is used inside.

Q. How the correct placement of Veress needle is ascertained?

Ans. Different methods are there to ascertain the correct placement of the needle:

- a) Hanging drop method.
- b) Syringe barrel test: Aspiration is done to exclude inadvertent injury to any organ. (examples are: Blood from vessel puncture, urine from bladder puncture and fecal matter from bowel puncture).
- c) Low intra-abdominal pressure (<10 mmHg) on correct placement of the needle.
- d) Obliteration of liver dullness on percussion when there is free flow of CO₂ inside the abdominal cavity.

Q. What are the different methods of hemostasis used during laparoscopic surgery?

Ans. 1. Electrocoagulation:

- a) Monopolar electrosurgery
- b) Bipolar electrosurgery

2. Laser coagulation (using CO₂, KTP-532, Nd-YAG lasers)

3. Ligasure—to cut and seal blood vessels

4. Enseal vessels fusion where tissues are desiccated and cut

5. Mechanical clips and staples (titanium clips and staples)

6. Sutures as used in open surgery.

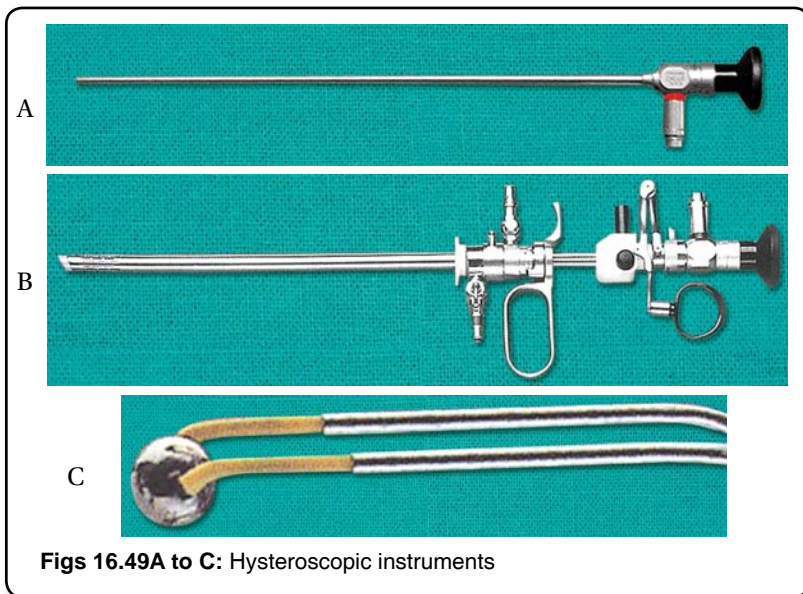
Q. What are the complications of laparoscopic surgery?**Ans.** Complications may be specific to laparoscopic surgery.

These are:

- a) Extraperitoneal insufflation leading to surgical emphysema.
- b) Cardiac arrhythmias due to CO₂ absorption.
- c) Injury to blood vessels (mesenteric and inferior epigastric vessels)
- d) Injury to viscera: Bowel and bladder
- e) Complications due to electrosurgical methods: Thermal injury to bowel, bladder and ureter.
- f) Other complications are due to anesthesia, infections, hemorrhage, etc.

Q. What are the contraindications of laparoscopy?

- Ans.**
- a) Severe cardiopulmonary disease
 - b) Patient hemodynamically unstable
 - c) Extensive peritoneal adhesions
 - d) Generalized peritonitis.

Fig. 16.49: Hysteroscopic Instruments

- A. Telescope:** Rigid telescopes are commonly used. The telescope may be either straight on (0°) or for oblique view 30°. Flexible telescopes are also used (Fig. 16.49A).
- B. Telescope with working elements (Fig. 16.49B)**
- C. Electrodes (coagulating roller ball electrode) (Fig. 16.49C).**

Self-assessment

- Indications of hysteroscopy
(see p 460)
- **Distension media used:** Commonly used liquid media—Glycine 1.5%. It does not conduct electricity. Other media used for hysteroscopy are:
 - ◆ Liquid media: Normal saline, mannitol (5%)
 - ◆ Gas media: Carbon dioxide (CO₂).
- Complications
(see p 461)

Q. What is hysteroscopy?

Ans. Endoscopic visualization of the cervical canal as well as the uterine cavity, is known as hysteroscopy. Hysteroscopy may be done for diagnostic as well as therapeutic purposes.

Q. What is the distension media used in hysteroscopy?

- Ans.**
- a) CO₂
 - b) Normal saline
 - c) Glycine 1.5%
 - d) Mannitol (5%).

Q. What are the contraindications of hysteroscopy?

- Ans.**
- a) Pelvic infection
 - b) Pregnancy
 - c) Cervical cancer
 - d) Cardiopulmonary disorders

SPECIMENS IN GYNECOLOGY

Chapter Objectives

Good knowledge and understanding of

- Macroscopic description of organ(s) with associated pathology
- Surgical procedures done in relation to such pathology
- Expected histopathology
- Management options
- Follow up management



A candidate is expected to be familiar with all the different items in the gynecology viva table

SPECIMENS IN GYNECOLOGY

Description:

The description of a specimen includes:

- Identification of the organ (s)
- To describe the pathology as seen on naked eye examination.

Identification of the organ (s)

Uterus

The uterus is identified by:

- Pear-shaped structure
- Adnexal attachment
- Cervical opening: Circular in nulliparous—Transverse slit in parous.

Anterior surface is identified by:

- Attachment of round ligament
- Loose attachment of uterovesical peritoneum.

Posterior surface is identified by:

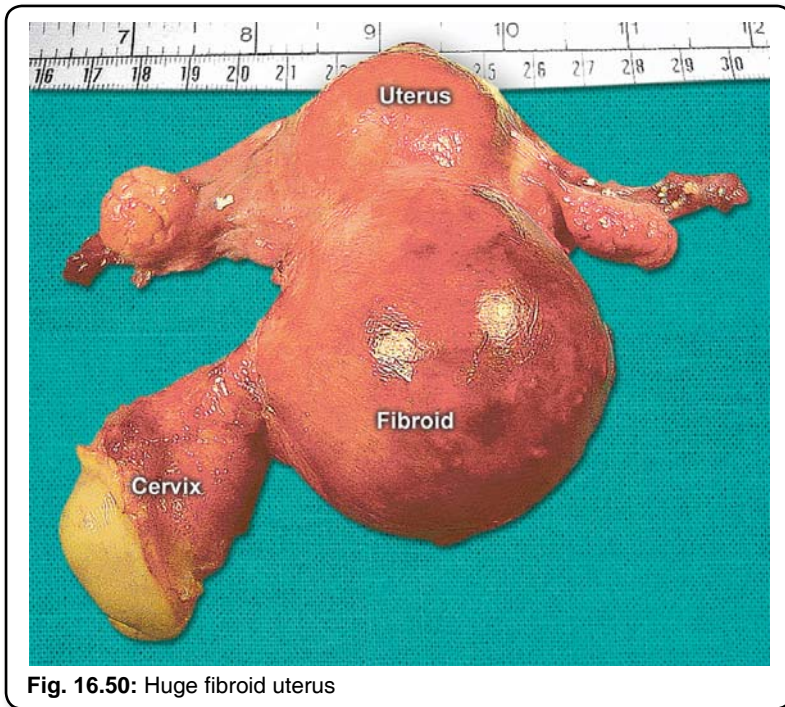
- Attachment of ovarian ligament with or without ovary.
- Cut margin of the posterior peritoneum which is densely attached and placed at a lower level than the cut edge of the anterior peritoneum.

Uterine tubes: Tubular structures with abdominal ostium surrounded by fimbriae and mesosalpinx.

Ovary: Fallopian tube is usually attached to the ovarian specimen. If the uterine tube is not mounted, even then the specimen is likely to be ovarian as there is no other pelvic organs resembling it, exception being a parovarian cyst (Fig. 16.67).

Structures attached at the cornu of the uterus:

- (1) Round ligament—A cord-like structure attached anteriorly and running laterally.
- (2) Fallopian tube—Round and a tube-like structure and extending laterally towards the ovary as fimbrial end. It lies in the middle.
- (3) Ligament of the ovary—A small and cord-like structure attached posterolaterally going to the ovary (see p 434, Fig. 15.18).

SPECIMEN — 1 (Fig. 16.50) and SPECIMEN — 2 (Figs 16.51 and 52)**Figs 16.50 and 16.51****Fig. 16.50:** Huge fibroid uterus

Description: This is a specimen of uterus with tubes and ovaries of both the sides (Fig. 16.50).

There is alteration in the size (enlarged) and shape (irregular) of the uterus due to (multiple) fibroid(s). The fibroids are of different sizes. Some are cut open to show whorled appearance (Fig. 16.52). A capsule is seen surrounding it (interstitial fibroid) or part of the tumor is covered by endometrium (submucous fibroid Fig. 16.51) or a part is covered by serous coat (subserous fibroid Fig. 16.52). One subserous fibroid has got a pedicle (Fig. 16.52)—pedunculated.

The tubes and the ovaries are looking normal.

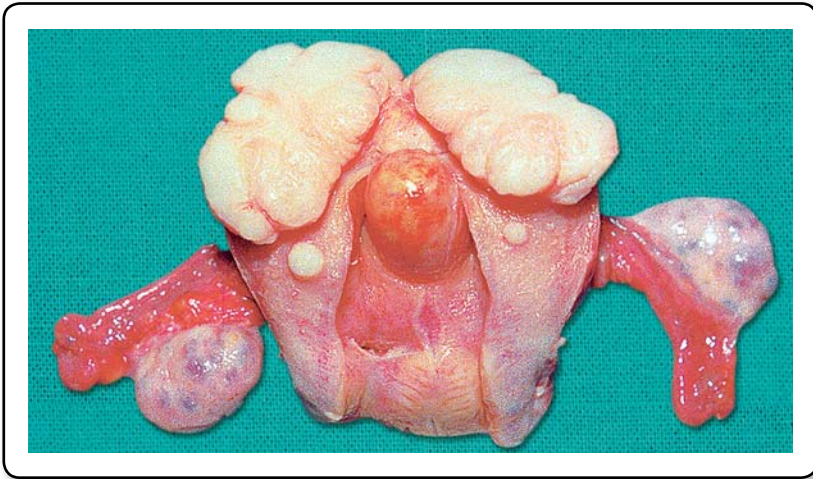
Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Multiple fibroids of the body of the uterus.

Self-assessment

Q. What are the causes of menorrhagia?

- Ans.**
- Increased surface area of the endometrium.
 - Interference with normal uterine contractility due to interposition of fibroid.
 - Pelvic congestion.
 - Hyperplastic endometrium due to hyperestrogenism.



Figs 16.51 and 16.52: Fibroid uterus — Subserous, interstitial and submucous variety. Specimen 17.52 has got a huge subserous (arrow) and also a pedunculated subserous variety of fibroid (arrow). Both the specimens are cut-opened to show the endometrial cavity. Both the cavities are increased and distorted.

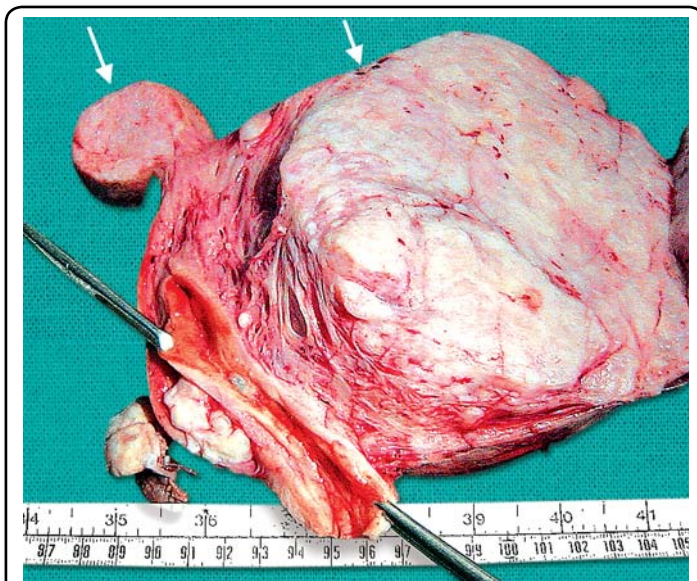


Fig. 16.52: Uterine cavity is shown with Allis tissue forceps

Q. What are the causes of infertility?

- Ans.**
- Distortion of uterine cavity
 - Endometrial congestion causing failure of nidation
 - Ulceration of endometrium (endometritis) causing defective nidation
 - Associated anovulation
 - Associated tubal block.

Q. What are the causes of pelvic pain?

- Ans.** ■ Degeneration of fibroid
- Extrusion of polyp
 - Associated with endometriosis
 - Pelvic infection (PID).

Q. How to differentiate a fibroid from an ovarian tumor on clinical examination?

- Ans.** Detailed history taking and clinical examination is helpful to differentiate the two.

History of menorrhagia, dysmenorrhagia, slow growth favors fibroid.

| Uterine (Fibroid) | Ovarian tumor |
|---|---|
| Abdominal examination difficult to differentiate at times | |
| Bimanual examination | |
| <ul style="list-style-type: none"> ■ Uterus is not felt separated from the mass ■ On moving the cervix by vaginal fingers: The mass felt per abdomen also moves simultaneously ■ On moving the mass per abdomen: The cervix moves as felt by the vaginal fingers | <ul style="list-style-type: none"> ■ Uterus is felt separated from the mass ■ The mass felt does not move ■ The cervix does not move |
| Exception: Pelvic adhesions that may fix the mass to the uterus | |

Place of medical management: Medical management is aimed to improve the symptoms of the woman. The common indications of medical management are:

- a) To improve menorrhagia
- b) To correct anemia
- c) To relieve pelvic pain.

Q. What are the different types of medical management available?

- Ans.** ■ Prostaglandin synthetase inhibitors
- LNG-IUS
 - GnRH analogs
 - ◆ Agonists
 - ◆ Antagonists.
 - Danazol
 - Antiprogestosterone (Mifepristone).

Other symptoms could be:

- ♦ Abdominal swelling
- ♦ Pressure symptoms.

What is the place of hysterectomy?

Ans. Elderly women (>40 years), with symptomatic fibroid who have completed their family are considered for hysterectomy. There is no risk of recurrence of either fibroid or menorrhagia following hysterectomy.

Q. What could be the presentation of the woman in the clinic?

NB. As these specimens are obtained following total hysterectomy, such women are unlikely to suffer from infertility. As bilateral oophorectomy had been done, their probable age would be > 45 years.

Q. What are the different treatment options available for fibroids?

Ans. A. Surgery—(a) Myomectomy, (b) hysterectomy and (c) myolysis.

Myomectomy may be done by:

(i) Laparotomy, (ii) laparoscopy or (iii) hysteroscopy

B. Medical therapy (see p 319)

C. Interventional radiology—Uterine artery embolization.

Q. How do you differentiate fibroid uterus from adenomyosis?

Ans. (see p 408)

Q. What are the indications of myomectomy?

Ans. (see p 438)

Q. What are the prerequisites to myomectomy?

Ans. (see p 494)

Q. What are the contraindications to myomectomy?

Ans. (see p 438)

SPECIMEN — 3**Fig. 16.53**

Description: This is a specimen of uterus, with tubes and ovaries of both the sides.

Anterior surface of the uterus is cut open to show a mass arising from the fundus protruding into the uterine cavity. Another mass is seen to come out of the uterus through the cervical canal with a long pedicle.

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Submucous fibroid-polyps—Sessile and pedunculated.



Fig. 16.53: Submucous fibroid polyps (sessile and pedunculated). Patient suffered menorrhagia, metrorrhagia and dysmenorrhea

Self-assessment:

Q. *What would be the clinical presentation in such a case (Fig. 16.53)?*

Ans. Common clinical presentation in such a woman is:

A. Menstrual abnormality

- ♦ Menorrhagia
- ♦ Dysmenorrhea
- ♦ Metrorrhagia.

B. Pain abdomen

Q. *How do you confirm the diagnosis?*

Ans.

- A. Clinically the pedunculated polyp can be seen on speculum examination
- B. Ultrasonography can be helpful in the diagnosis
- C. Sonohysterography
- D. Hysteroscopy with direct visualization of the polyps

Q. *When do myomas require to be removed (indications of myomectomy)?*

Ans. (i) Any myoma growing during the follow up period.

(ii) Menorrhagia not responding to medical therapy.

(iii) Excessive pain or pressure symptoms.

(iv) Woman with infertility or recurrent miscarriage when no cause other than fibroid is present.

Q. *What are the secondary changes in a fibroid?*

Ans. A. Degenerations (common = hyaline 65%)

B. Atrophy (postmenopausal age)

- C. Necrosis
- D. Sarcomatous change (rare).

Q. What are the different treatment options available for fibroids?

Ans. A. Medical and B. Surgical

- A. Medical: Drugs used are: Prostaglandin synthetase inhibitors, GnRH analogues, antiprogestrone (mifepristone) and LNG-IUS.
- B. Surgical methods include:
 - Myomectomy
 - Embolotherapy
 - Myolysis
 - Hysterectomy.

SPECIMEN — 4

Figs 16.54A and B

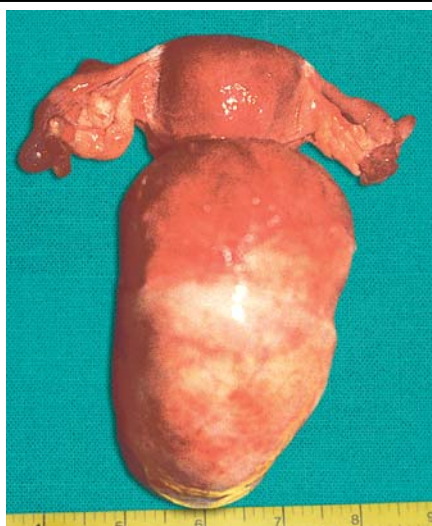


Fig. 16.54A: A huge posterior cervical fibroid



Fig. 16.54B: Same specimen as in 16.54(A), is seen from the anterior surface

Description: This is a specimen of uterus (Fig. 16.54A) with tubes and ovaries of both the sides. There is a huge mass arising from the posterior cervical wall. The small uterus sits on the top of the huge mass. (Lantern on dome of St. Paul's).

The anterior surface of the uterus (Fig. 16.54B) is cut open to show the anterior cervical wall and the uterine cavity.

Operation done:

Total hysterectomy with bilateral salpingo-oophorectomy with removal of the mass.

Diagnosis: Cervical fibroid (posterior).

Self-assessment:

Q. What are the types of cervical fibroid ?

- Ans.**
1. Anterior cervical: May produce urinary symptoms (retention).
 2. Posterior cervical: May cause rectal symptoms (constipation).

3. Lateral cervical: Compression effect to blood vessels and displacement of the ureter.

4. Central cervical: (Lantern on the dome of St. Paul's).

Q. Modes of presentation in a case with cervical fibroid?

Ans. Woman often present with pressure symptoms depending upon the location of the fibroid.

Q. Approach for surgical removal of cervical myoma?

Ans. It depends upon the location of the myoma—anterior approach for anterior cervical myoma, posterior approach for posterior cervical myoma. For central cervical myoma, central approach through utero-vesical pouch is done otherwise hemisection of the uterus is done to reach the myoma. The myoma is enucleated (intracapsular).

Q. What type uterine fibroid has the risks of ureteric injury?

Ans. Cervical fibroids may compress the ureters. There is lateral displacement of the ureter in a lateral cervical fibroid. Ureter lies outside the capsule of the fibroid. Myomectomy should be done intracapsular.

Q. What are the common gynecological pathologies where ureteric injury is more likely?

Ans. Common pelvic pathology to cause ureteric injury are:

- Cervical fibroid
- Broad ligament tumor
- Pelvic endometriosis
- Gynecological malignancy
- Radical hysterectomy
- Colposuspension.

SPECIMEN — 5

Figs 16.55A and B

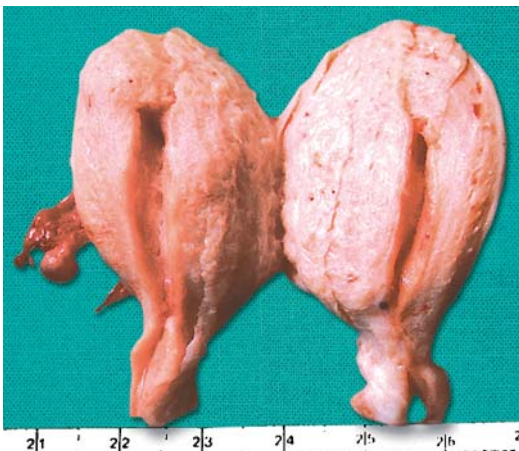


Fig. 16.55(A): Specimen of adenomyosis



Fig. 16.55(B): Adenomyosis (diagrammatic)

Description: This is a specimen of the uterus and the tubes and ovaries of both the sides. The uterus is enlarged and is cut open to show a diffuse growth located at one wall. The growth presents a striated appearance with scattered dark hemorrhagic spots. It has got no capsule. (whereas in a case with fibroid uterus it has whorled appearance and a capsule).

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Adenomyosis.

Practical Gynecology

Self-assessment:

- Clinical features of pelvic endometriosis (see p 371).
- Causes of infertility in endometriosis (Dutta Gyne 6/e, p 231).
- Clinical features of adenomyosis (see p 372).
- Histological picture of adenomyosis (see p 560).
- Treatment for pelvic endometriosis (see p 371).
- Treatment for adenomyosis (see p 372).

SPECIMEN — 6

Fig. 16.56



Fig. 16.56: Hydatidiform mole with bilateral large theca lutein cysts

Description: This is a specimen of the uterus with tubes and ovaries of both the sides. The ovaries are hugely enlarged, lobulated with a yellowish tinge. The uterus is also enlarged. Vesicular mass is seen protruding out through the window of the incised uterus.

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Hydatidiform mole with large theca lutein cysts of both the ovaries.

Self-assessment:■ **High-risk factors for gestational trophoblastic neoplasia (GTN)**

- ♦ Duration of disease >4 months
- ♦ Initial serum β hCG >40,000 mIU/ml
- ♦ Metastasis to brain or liver
- ♦ Failure of prior chemotherapy
- ♦ GTN developing following a term pregnancy
- ♦ WHO score is ≥ 7

■ **Clinical features of GTN .**

- ♦ Persistent ill health
- ♦ Irregular vaginal bleeding, at times heavy
- ♦ Symptoms due to metastasis
- ♦ Lung: Cough, hemoptysis
- ♦ Cerebral: Convulsions, Headache, Coma
- ♦ Liver: Jaundice
- ♦ Vagina: Bleeding

Q. What is the management protocol of GTN?

Ans. Management protocol includes:

- A. Chemotherapy (single agent or multiple agent)
- B. Surgery: Hysterectomy
- C. Radiation therapy
- D. Combination therapy.

- **Management of theca lutein cysts:** Once hydatidiform mole or GTN is treated, spontaneous regression (within a few months) of the cysts are observed. Rarely they are removed when complications like torsion or intracystic hemorrhage occur.

Q. What are the common sites of metastasis?

Ans. (see p 406)

Q. What is the place of prophylactic chemotherapy and what are its limitations?

Ans. Prophylactic chemotherapy is not recommended as a routine as the drugs used are toxic. Majority of patients (80–90%) do not need it. Therefore women “at risk” may be considered following evacuation of molar pregnancy.

Q. WHO scoring system for risk assessment.

Ans. (a) Age is >35 years, (b) Initial serum levels of hCG is $\geq 100,000$ IU/mL

(c) Failure of hCG to become normal by 7–9 weeks time or there is re-elevation, (d) Evidence of metastatic disease, (e) Recurrent molar pregnancy, (f) Patient unreliable for follow-up.

Q. Reproductive behavior of women following treatment of GTN.

Ans. Usually there is no adverse effect on subsequent pregnancy. However risk of premature ovarian failure and secondary malignancy have been observed.

SPECIMEN — 7

Fig. 16.57

Description: This is the specimen of a uterus with the tubes and ovaries. The uterus is enlarged. The anterior surface of the uterus is cut open to show a purplish growth invading the myometrium. The tube and the ovary are looking healthy.

This 37-year-old parous lady was admitted with irregular bleeding P/V following a miscarriage. She underwent D/C thrice. Her serum β hCG level following the present admission was 96,000 mIU/ml. Even following courses of chemotherapy the serum hCG level remained persistently elevated.

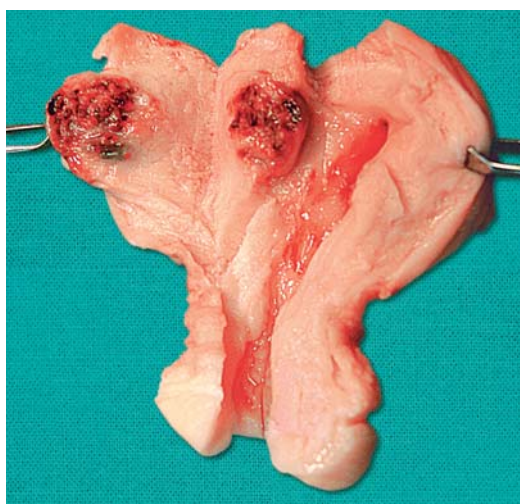


Fig. 16.57: Hemorrhagic growth is seen within the myometrium. Patient was resistant to chemotherapy

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy. Histology confirmed choriocarcinoma.

Diagnosis: Choriocarcinoma of the uterus.

Self-assessment:

Q. How the selection of chemotherapy regimen is done?

Ans. In general patients with nonmetastatic (low risk) and good prognosis disease are treated with single agent therapy. Methotrexate or actinomycin D is commonly used. However patients with poor prognosis, high risk or and metastatic disease are treated with combination drug (EMACO) regimen.

Q. What is the place of hysterectomy in GTN?

Ans. ■ Elderly females, family completed
■ Placental site trophoblastic tumor
■ Lesion resistant to chemotherapy.

Q. How is the follow up done in such case?

Ans. Follow up is done for all patients at least for 2 years. serum β hCG is measured weekly till negative → monthly for 6 months → 6 monthly thereafter.

SPECIMEN — 8

Fig. 16.58

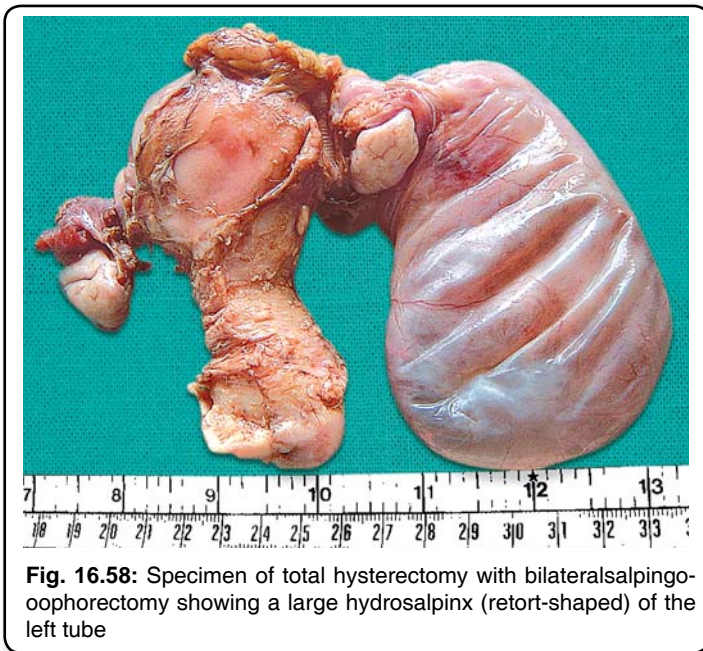


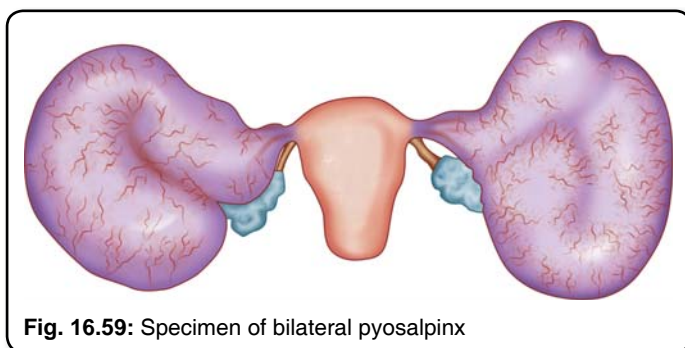
Fig. 16.58: Specimen of total hysterectomy with bilateralsalpingo-oophorectomy showing a large hydrosalpinx (retort-shaped) of the left tube

Description: This is a specimen of uterus, tubes and ovaries of both the sides. The left tube is markedly enlarged specially towards the outer half. The shape looks like a 'retort'. The inside fluid appears to be clear.

Diagnosis: Hydrosalpinx of the left tube.

Self-assessment:

- Pathogenesis of hydrosalpinx (see p 415)
- Organisms involved in pathology (see p 415)
- Mode of affection in gonococcal infection (see p 347, 531)
- Cause of the 'retort' shape (see p 415).
- Steps of salpingectomy (Dutta Gyne 6/e, p 602)

SPECIMEN — 9**Fig. 16.59****Fig. 16.59:** Specimen of bilateral pyosalpinx

Description: This is a specimen of the uterus, tubes and ovaries of both the sides. The tubes of both sides are hugely dilated, coiled, wall is thickened and matted with the ovaries. There are evidences of adhesions over the surfaces of the tubes and uterus. Pus is coming out of through the fimbrial end of the tube.

Diagnosis: Bilateral pyosalpinx.

Self-assessment:**Bilateral pyosalpinx**

Q. What is the pathogenesis of bilateral hydrosalpinx?

Ans. It is usually the end result of repeated attacks of endosalpingitis by pyogenic organisms. The common organisms *E. coli*, chlamydia treatments or gonococcus.

Q. Mention the clinical presentation of such a case.

Ans. Abdominal tenderness

Adnexal tenderness

Formation of tubo ovarian mass.

Q. What is the mode of spread for pyogenic, tuberculosis of other infections?

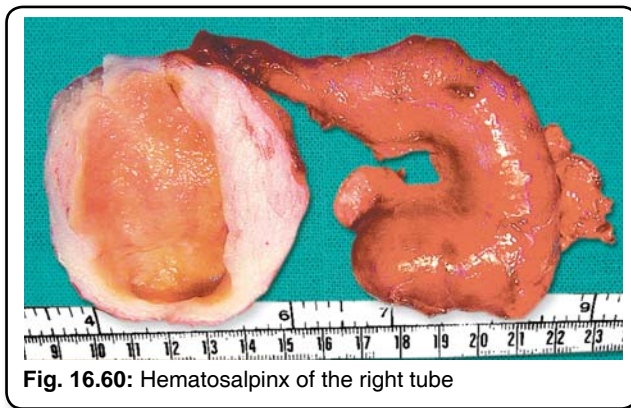
Ans. A. Pyogenic: Through lymphatic of pelvic viscera

B. Tubercular: Through blood stream

C. Gonococcal: Through continuity

Q. Mention the complications of acute PID and the late sequelae.

Ans. a. Dyspareunia, b. infertility, c. Adhesion formation, d. chronic pelvic pain.

SPECIMEN — 10**Fig. 16.60****Fig. 16.60:** Hematosalpinx of the right tube

Description: This is a specimen of a noncommunicating horn of a bicornuate uterus (cut-opened) with the tube. The tube is elongated, sausage-shaped and purplish in color. The cut-open uterus shows the cavity which was filled with blood. The tube is filled with blood.

Operation done: Excision of the noncommunicating horn and the tube (salpingectomy).

Diagnosis: Rudimentary horn of the uterus with hematosalpinx.

Self-assessment:

- **Causes of hematosalpinx**

Tubal ectopic pregnancy, endometriosis, cryptomenorrhea and rarely primary tubal carcinoma (0.3% of all genital malignancies).

- **What are the causes of cryptomenorrhea:**

1. Imperforate hymen
2. Cervical stenosis
3. Vaginal stenosis or atresia.

- **What is the clinical presentation of a tubal carcinoma?**

Triad of lower abdominal pain (colicky), profuse watery discharge (hydrops tubae profluens) and vaginal bleeding. Preoperative diagnosis is rare and often mistaken as an ovarian tumor.

SPECIMEN — 11**Figs 16.61A and B**

Fig. 16.61A: Gross appearance of a dermoid cyst of the ovary showing hair, teeth (arrow) and butter balls (sebum aggregated to form spherules)

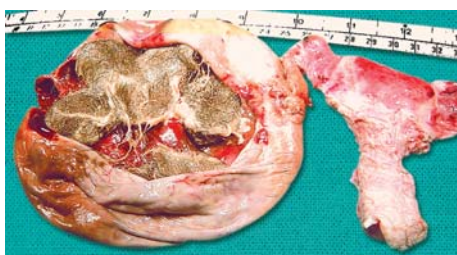


Fig. 16.61B: Gross appearance of dermoid cyst of the ovary with hair and sebaceous material (cut section)

Description: These are the specimens of the uterus with tube and ovary of the right side. The ovarian cysts (right) are cut open to show inspissated sebaceous material, hair and other mature (mesenchymal) tissues. Teeth is present in about a third (see Figs 16.61A and B and 16.85 and 16.86).

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Dermoid cyst of the right ovary.

Self-assessment

- **Name the tissues arising from the three germ cell layers**
Ectoderm: hair, Mesoderm: cartilage, Endoderm: glands
- **What is the frequency of bilaterality in dermoid cyst?**
Frequency of bilaterality is about 15–20%
- **Common complication of dermoid**
Torsion
- **Management of dermoid in a young patient**
Cystectomy

■ **Risk of malignant change in dermoid**

Risk of malignant change is about 1–2%.

Q. What are strumal carcinoids?

Ans. These are teratomas and secrete serotonin (5-HT), and bradykinin. Patients usually present with the symptoms of abdominal pain, facial flushing, diarrhea or bronchospasm.

Q. How carcinoid tumours of the ovary are treated?

Ans. Excision of the tumor (ovariotomy) causes rapid fall in the serum level of serotonin and disappearance of 5-hydroxyindoleacetic acid in the urine. There is rapid remission of symptoms.

SPECIMEN — 12

Fig. 16.62



Fig. 16.62: Left-sided mucinous cystadenoma (gross appearance on cut specimen)

Description: This is a specimen of the uterus with tubes and ovaries of both the sides. The left-sided ovarian cyst is cut open to show many septa. There are few smaller cysts projecting inside.

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Mucinous cystadenoma.

Self-assessment:

- **Common epithelial tumors of the ovary** (see p 324).
- **Discuss the differential diagnosis of a pelvic abdominal lump?** (see p 412).

- **Clinical presentation of a benign ovarian tumor** (see p 326).
- **Features of a functional cyst** (see p 323).
- **How a benign ovarian tumor could be differentiated from a malignant one clinically?** (see p 325).
- **How laparotomy findings could be helpful to differentiate a benign tumor from a malignant one?** (see p 324).
- **What are psammoma bodies?** (see p 412).
- **What are the complications of a benign ovarian tumor?** (see p 323).
- **Management of a benign ovarian tumor** (see p 325).

Q. What are the structures forming the ovarian pedicle?

Ans. Structures forming the ovarian pedicle are:

Laterally: a) Infundibulopelvic ligament

Medially: a) Ovarian ligament, b) medial end of the fallopian tube,
c) mesosalpinx containing utero-ovarian anastomosis.

Middle: Part of broad ligament

SPECIMEN — 13

Fig. 16.63

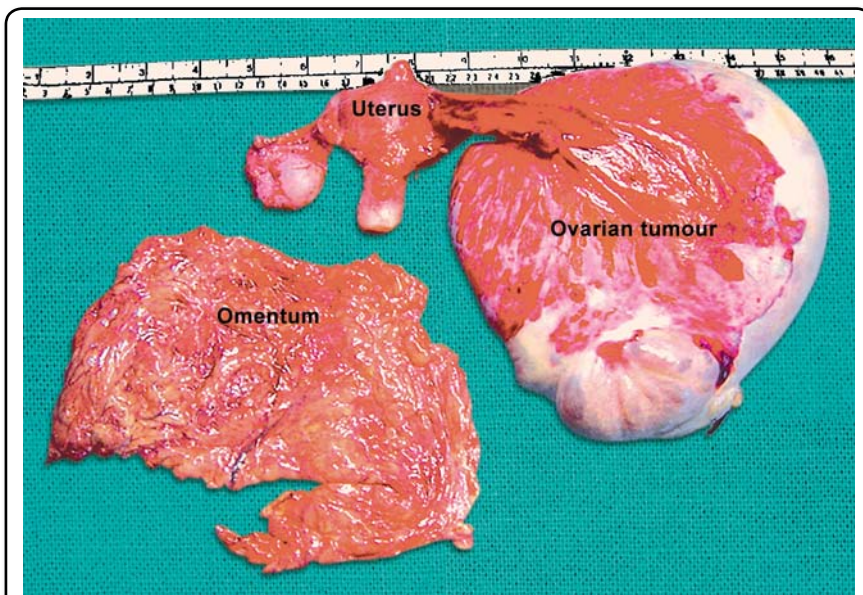


Fig. 16.63: Bilateral mucinous cystadenocarcinoma (confirmed on histology). Total hysterectomy, bilateral salpingo-oophorectomy with total omentectomy done

Description: This is a pathological specimen of the uterus and both the ovaries. The ovaries are: enlarged lobulated with the walls irregular and shaggy. Cut section shows solid areas with hemorrhage and necrosis at places.

Diagnosis: Most likely malignant ovarian tumors.

Self-assessment:

- **Clinical features of a malignant ovarian tumor** (see p 326).
- **What are the common malignant ovarian tumors?**

(see p 413).

Q. *How omentectomy is helpful in the management of ovarian malignancies?*

Ans. Omentum is the common site of metastasis either microscopic or in the form of nodules. In advanced cases, omental cake is formed. Removal of omentum removes the bulk of the tumor as much as possible. This improves the result of subsequent chemotherapy or radiotherapy.

Q. *Is epithelial ovarian cancer hereditary?*

Ans. About 5–10% of all epithelial ovarian cancers are familial. There are three different syndromes of hereditary ovarian cancer: (i) Breast/ovarian familial cancer (75–90%), (ii) Site specific ovarian cancer (5%) and (iii) Lynch II syndrome (2%)—(Dutta Gyne 6/e, p 371).

- **Preventive measures against ovarian malignancy** (see p 326).
- **Mention the high-risk factors as well as the protective factors for ovarian malignancy** (see p 326).
- **Principles of surgical approach (guidelines) in a malignant ovarian tumor** (see p 327).

Q. *What is the primary surgery done in a case of advanced malignant ovarian tumor?*

Ans. Exploratory laparotomy → cytoreductive surgery (debulking procedure) is done. This includes: Total abdominal hysterectomy, bilateral salpingo-oophorectomy, infracolicomentectomy and resection of any metastatic tumor. Cytoreductive surgery is aimed at reducing the tumor load. Lesser the residual tumor volume (< 1 cm), better is the response with chemotherapy and better is the survival.

Q. *How serum CA-125 measurement is helpful?*

Ans. It is helpful with a known case of ovarian cancer to assess the prognosis of the disease:

- (i) Serum CA-125 is a glycoprotein and has got more prognostic value than diagnostic.
- (ii) To know the response of treatment.

(iii) To know tumor resistance to chemotherapy.

(iii) Early detection of tumor recurrence.

Q. What is the place of prophylactic oophorectomy during hysterectomy?

Ans. (see p 319)

SPECIMEN — 14

Fig. 16.64

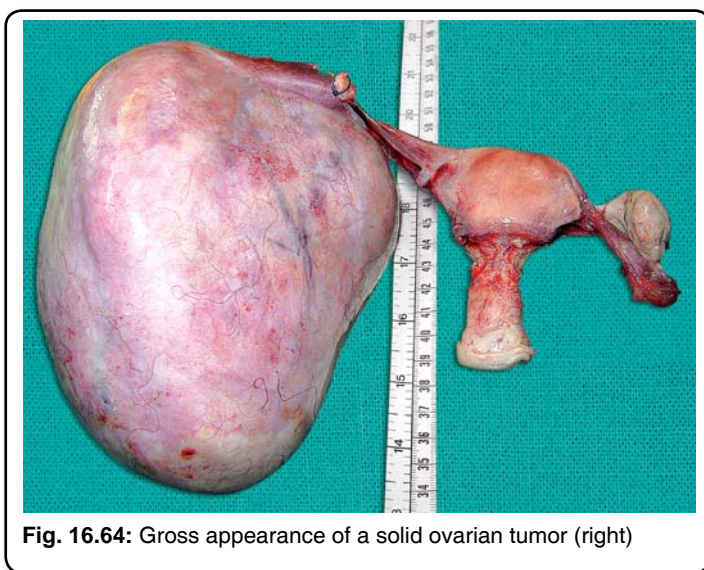


Fig. 16.64: Gross appearance of a solid ovarian tumor (right)

Description: This is a specimen of uterus with tubes and ovaries of both the sides. The right ovary is hugely enlarged and cut opened to show its solid texture and a yellowish hue. The surface of the tumor is bosselated and glistening.

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Solid ovarian tumor.

Self-assessment:

Q. Common solid tumors of the ovary.

Ans. Benign: Fibroma, thecoma, Brenner tumor

Malignant: Primary ovarian carcinoma, dysgerminoma, immature teratoma, mesonephroma

Q. What is Meigs' syndrome?

Ans. It is a triad of findings including ascites, pleural effusion and benign ovarian fibroma. The cause is unknown. The ascites and pleural effusion resolve spontaneously when the ovarian tumor is removed.

Q. What are the hormone producing tumors of the ovary.

- Ans. ■ Feminising tumors:** Granulosa cell and theca cell.
- **Masculinising tumors:** Sertoli-Leydig cell and Hilus cell.
- **Others:** Struma ovarii (thyroid hormones) carcinoids (rare specialised germ cell ovarian tumors that secrete 5-HT).

Q. What are germ cell tumors of the ovary.

Ans. (see p 324)

SPECIMEN — 15

Fig. 16.65

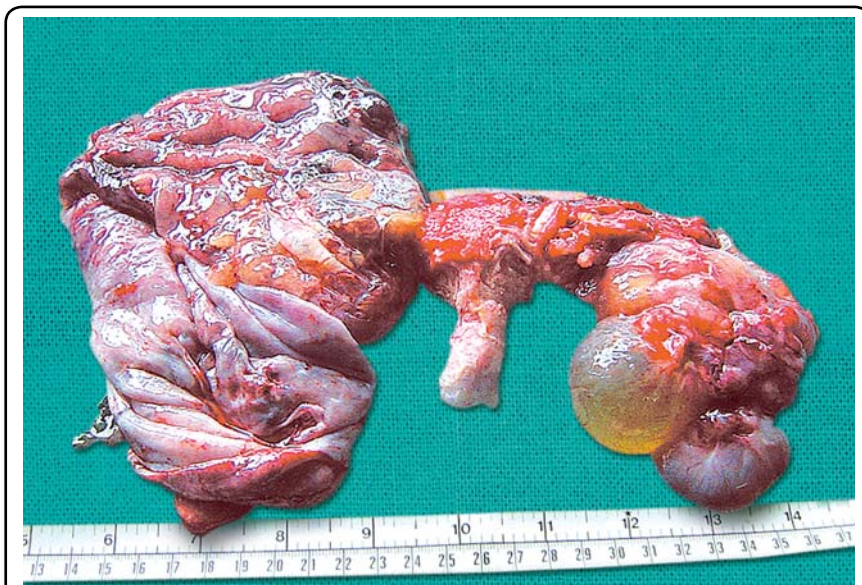


Fig. 16.65: Bilateral mucinous adenocarcinoma of the ovaries (gross appearance on cut specimen)

Description: This is a specimen of the uterus with tubes and ovaries of both the sides. The ovaries are enlarged with capsules ruptured. There is exophytic papillary growth on the surface and the growth infringes the surrounding organs. The cut surfaces show solid texture, extensive areas of hemorrhage and necrosis.

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Bilateral ovarian carcinoma (papillary serous cystadenocarcinoma).

Self-assessment:

- **Reasons for difficulties in the management of ovarian cancers** (see p 413).
- **What are the chemotherapeutic agents commonly used?** (see p 328).

Q. What is the place of neoadjuvant chemotherapy for ovarian malignancy?

Ans. Neoadjuvant chemotherapy is done in few cases of epithelial ovarian cancers. This is followed by interval primary cytoreductive surgery. This is done in a case with advanced ovarian malignancy. Benefits are: i) Rapid clinical improvement, ii) Maximum cytoreductive surgery may be possible thereafter.

Q. What are the methods of spread in a case of ovarian malignancy?

Ans.

1. Transcelomic (exfoliated cells in the peritoneal cavity) spread
2. Lymphatic (para-aortic and superior gastric)
3. Direct (adjacent tube and peritoneum)
4. Hematogenous (late feature).

Q. What is the place of second look surgery?

Ans. This is less commonly done. Secondary surgery may be done in a case after primary suboptimal debulking procedure and chemotherapy.

Q. What are the prognostic factors in ovarian malignancy?

Ans. Important prognostic factors for ovarian malignancy are:

- i) Surgical stage (FIGO) of the disease (Worse > Stage II).
- ii) Histological type (endometrioid is better when compared to papillary serous) and grade (higher the grade, poorer the prognosis) of the tumor.
- iii) Presence of ascites: Poor outcome.
- iv) Presence of metastatic disease.

SPECIMEN — 16

Fig. 16.66: Krukenberg tumor



Fig. 16.66: Krukenberg tumor

Description: This is a specimen of the uterus with tubes and ovaries of both the sides. The ovaries are found enlarged with lobulated appearance and are free of adhesions. The shape of the ovary is maintained. The color is pinkish with smooth surfaces. Uterus and tubes are found normal.

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis

Probably Krukenberg's tumor.

Self-assessment:

Q. What is a Krukenberg tumor?

Ans. This is a metastatic adenocarcinoma of the ovary. Almost all metastasize from the stomach. Few arise in the breast, colon or biliary tract.

Q. What is the suggestive appearance of the tumor for diagnosis?

Ans. The tumor is usually bilateral, lobulated, solid in appearance with smooth surfaces. Usually adhesions are absent.

Q. What are the primary sites?

Ans. Common primary sites are : GI tract (stomach, pylorus and colon), gallbladder, breast and endometrial carcinoma.

Q. What is the mode of spread to the ovaries?

Ans. a) Retrograde lymphatic or b) transcelomic spread

Q. What is the histological picture of the tumor?

Ans. The epithelial cells of the tumor look like 'signet ring'. These cells are characteristic of Krukenberg's tumor

Q. What is the Prognosis of the tumor?

Ans. Poor.

Q. What is the survival rate?

Ans. Median survival is less than a year in majority of the cases.

SPECIMEN — 17

Fig. 16.67

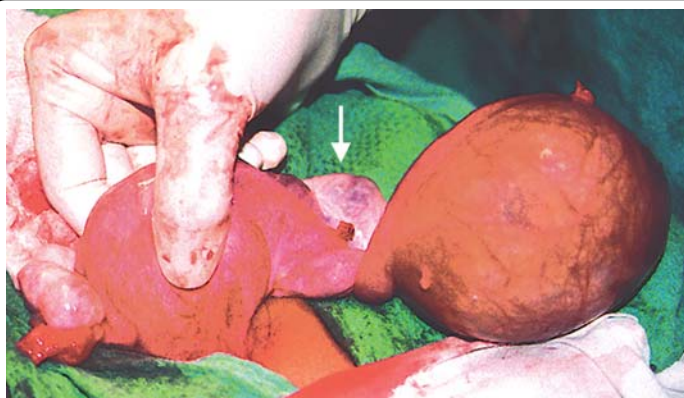


Fig. 16.67: At a glance, it seems to be a twisted ovarian cyst but careful inspection reveals the ovary (see arrow) is separated from the cyst

Description: This is a specimen of the uterus with the tubes and ovaries. A hugely enlarged cyst is attached to the fimbrial end of the left tube which is stretched out. Left ovary is seen clearly (see arrow) behind the tube.

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy with removal of the cyst is done.

Diagnosis: Parovarian cyst (left).

Self-assessment:

Q. How do you diagnose a parovarian cyst?

Ans. The ovary is seen separated from the cyst. The uterine tube is stretched over the cyst.

Q. What is the embryological origin of the cyst?

Ans. From the remnant of the wolffian body, situated in the mesosalpinx.

Q. Usually the cyst is unilocular, has a thin wall and is filled with a clear fluid.

Q. What is the clinical features and management of the cyst?

Ans. Same as ovarian cyst.

Q. Management

Ans. Excision of the cyst.

Q. What is the risk of malignancy?

Ans. Rare.

SPECIMEN — 18**Fig. 16.68**

Fig. 16.68: A nodular growth (squamous cell carcinoma) occupies the posterior lip of the cervix in this specimen — Wertheim's radical hysterectomy done

Description: This is a pathological specimen of the uterus, tubes and ovaries (both the sides) with upper vagina and parametrium of both the sides. The uterus is cut open to show a nodular growth on the ectocervix (lymph nodes are not shown in the photograph).

Operation done: Radical hysterectomy (Wertheim's operation) for carcinoma cervix.

Diagnosis: Carcinoma cervix.

History: *Wertheim, Ernst (1864–1920): Wertheim is best known for his radical abdominal hysterectomy, although he had many other contributions in vaginal surgery, specially for prolapse. He started his work as an assistant to Friedrich Schauta at German University. Later on he became the Professor of Gynecology in Vienna University.*

Self-assessment:

- **Histological types**

Common histological types are:

- A. Squamous cell carcinoma (85-90%) and
- B. Adenocarcinoma (10-15%)

- **Diagnosis of early carcinoma** (see p 390, 401).

Q. Outline the lymphatic drainage of the cervix?

Ans. The lymphatic vessels from the cervix drain into the following groups of primary lymph nodes:

- A. a) Parametrial group b) Internal iliac group
 c) Obturator group d) External iliac group
 e) Sacral group.
- B. Secondary groups include:
 a) External iliac b) Common iliac
 c) Para-aortic nodes

Q. What is the management of CIS, microinvasive and early stage Carcinoma

See p 375

Q. Mention the advantages and disadvantages of radiotherapy

Ans.

| RADIOTHERAPY | |
|---|---|
| Advantages | Disadvantages |
| a) Can be used for all stages for cancer cervix stages | a) Intestinal and urinary tract strictures, radiation hazards |
| b) Say overall survival rate is 85% and it is comparable with that of surgery | b) Vaginal fibrosis |
| c) Less primary mortality and morbidity | c) Radiation menopause in a young patient unless ovaries are transposed |

Q. What are the tissues removed in radical hysterectomy?

Ans. a) Uterus and cervix; b) wide tissues of parametrium; c) periureteral tissues; d) superior vesical artery; e) cardinal and uterosacral ligaments; f) upper three fourth of vagina and g) thorough pelvic lymphadenectomy.

Q. What are the procedures as per FIGO, not to be used for staging?

Ans. Procedures not to be used as a routine but options are:

- ♦ Ultrasonography ♦ Lymphangiography
- ♦ CT ♦ MRI
- ♦ PET ♦ Radionuclide imaging
- ♦ Laparoscopy or laparotomy.

Q. What are the complications of radical hysterectomy?

Ans. A. Complications are similar to that of total abdominal hysterectomy (see p 432)
 B. Specific complications of radical procedures are: a) Ureteric fistula, b) Vesico vaginal fistula, c) Bladder dysfunction, d) Lymphocyst formation

Q. What are the preventive measures of carcinoma cervix

Ans. 1. Primary prevention

- ♦ Identifying high risk women
 - a. Early sexual intercourse

- b. Early age of first pregnancy
- c. High risk HPV infection
- ♦ Prophylactic HPV vaccine
- ♦ Use of condom
- 2. Secondary prevention
 - a. Screening of cervical pathology for early detection in CIN and microinvasive stage
 - b. Down staging (WHO 1996).
 - c. High risk HPV infection

Q. *What is the place of vaccine in prevention of cancer cervix?*

Ans. (see p 394)

Q. *What are the causes of death in carcinoma cervix.*

Ans. Causes of death are:

- a. Uraemia
- b. Haemorrhage
- c. Sepsis
- d. Cachexia
- e. Complication due to metastasis.

Q. *What is the differential diagnosis of carcinoma cervix?*

Ans. Cervical cancer needs to be differentiated from:

- a. Tubercular ulcer of the cervix
- b. Syphilitic ulcer
- c. Cervical ectopy
- d. Products of conception in incomplete abortion
- e. Fibroid polyp (ulcerated).

Q. *What is the place of laparoscopic assisted vaginal trachelectomy?*

Ans. Indications are:

- a. To preserve the reproductive function of the woman
- b. In early stage disease (stage IAI, A2, IBI).

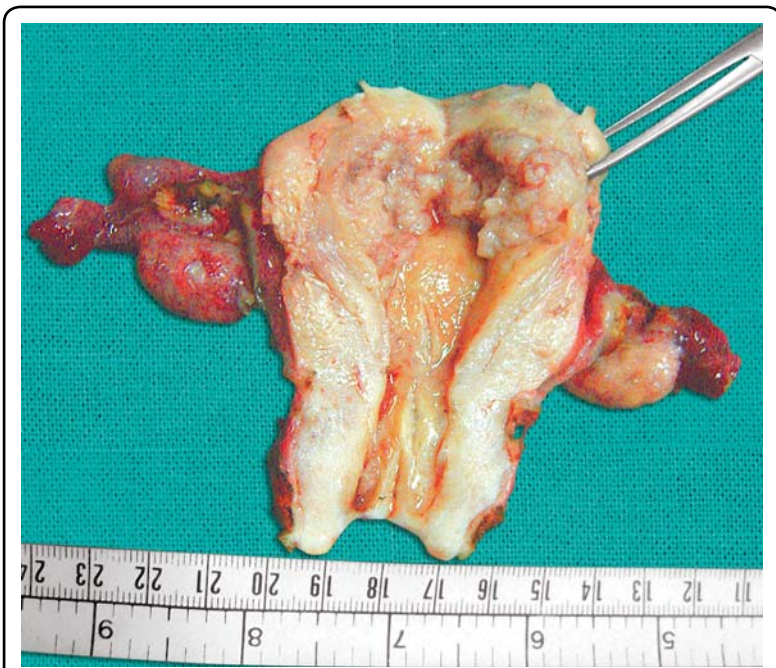
SPECIMEN — 19**Fig. 16.69**

Fig. 16.69: The uterus is cut open to show a diffuse and partly necrotic growth of adenocarcinoma filling the uterine cavity

Description: This is a specimen of the uterus with tubes and ovaries of both the sides. The uterus is uniformly enlarged. The anterior surface is cut open to show a fungating growth confined to the body. The tubes and ovaries are healthy.

Operation done: Total hysterectomy with bilateral salpingo-oophorectomy.

Diagnosis: Endometrial carcinoma.

Self-assessment:

Q. Discuss the specimen as seen in Fig. 16.69?

Ans. It is a specimen of the uterus cut opened to show a diffuse endometrial growth covering the region of the fundus. The growth is ulcerated. The rest of the cavity and endocervix appears free of the tumor.

Q. Mention the methods of diagnosis?

Ans. a) **History**—any case of the postmenopausal bleeding is considered to be endometrial cancer unless proved otherwise, b) **transvaginal ultrasonography** (TVS) endometrial thickness ≥ 4 mm is suggestive endometrial cancer, c) **endometrial biopsy** using a pipellele cannula or with a Sharman curette, d) **hysteroscopy** and targeted biopsy, e) **fractional curettage**, f) **computed tomography** (CT), g) **Magnetic resonance imaging** (MRI) are used for myometrial invasion.

Q. What are the histological types of endometrial carcinoma?

Ans. a) Adenocarcinoma (endometrioid 80%); b) adenocarcinoma with squamous elements; c) papillary serous carcinoma.

Q. What are the lymphatic drainage of body of the uterus?

Ans. a) From the fundus and adjoining part of the body through lymphatics draining along the ovarian lymphatics to the para-aortic group of nodes, b) from the cornu-drains in the superficial inguinal nodes along the round ligament, c) rest of the body of the uterus drains into external iliac group of nodes, d) adjacent to the cervix → along the cervical lymphatics (see below).

Q. Who are the high-risk women?

Ans. a) Persistent stimulation of endometrium with unopposed estrogen, b) age: median age of 60; c) parity: Nulliparous woman, d) late menopause, e) corpus cancer syndrome (obesity, hypertension and diabetes), f) obesity, g) family history of ovary, breast or colon cancer.

Q. Surgical procedures in the management ?

Ans. a) Extra fascial hysterectomy with bilateral salpingo-oophorectomy is commonly done for endometrial cancer confined to the body, b) Combined therapy is considered for cases depending upon the FIGO stage of the disease (myometrial invasion). Adjuvant radiotherapy is usually given in cases with myometrial invasion.

Q. What is the place of chemotherapy and radiotherapy?

Ans. a) Combined therapy with radiation followed by extended hysterectomy at an interval of 6 weeks is done in a case with stage II carcinoma, b) Chemotherapy is used in advanced cases. Commonly used drugs are: Progestogens, Adriamycin, carboplatin and paclitaxel

SPECIMEN — 20**Fig. 16.70**

Description: This is a specimen of the vulva. The vulva shows a large exophytic growth and biopsy revealed squamous cell carcinoma.

Operation done: Radical vulvectomy. Vulvectomy specimen is obtained by the skin sparing “long horn” incisions. Tips of the horns rest on the anterior superior iliac spines. The upper margin of incision is interspinous, the lower margin is along the inguinal skin creases and the labiocrural folds. Three incision technique is currently used in most of the centers.

Diagnosis: Carcinoma of the vulva.

Self-assessment:

Q. What are the common sites of vulval malignancy?

- Ans.** a. Labium majus
b. Clitoris
c. Labium minus.

Q. What are the different histological types?

- Ans.** a. Squamous cell carcinoma
b. Melanoma
c. Adenocarcinoma
d. Basal cell carcinoma
e. Sarcoma.

Q. What is the clinical presentation of a case?

- Ans.** a. May be asymptomatic
b. Pruritus vulvae
c. Swelling of vulva with discharge
d. Vulval ulceration
e. Bleeding
f. Inguinal mass (enlarged lymph nodes)

Q. What are the types of vulvectomy?

- Ans.** **a. Simple vulvectomy:** Tissues removed are mons pubis, clitoris, labia majora and minora, **b. Radical vulvectomy:** Removal of entire tissues of vulva along with bilateral inguinofemoral lymphadenectomy.

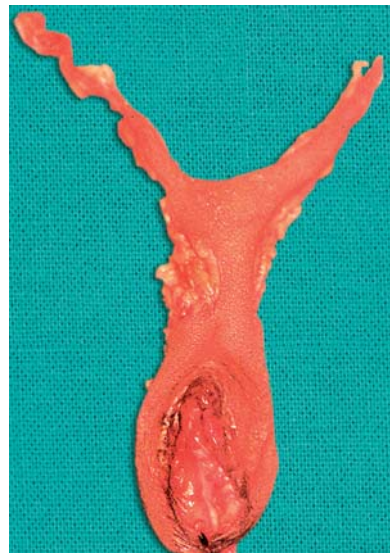


Fig. 16.70: Carcinoma of the vulva — radical vulvectomy done using “long horn” incisions

Q. What are the complications of radical vulvectomy?

- Ans.** A. **Early:** Hemorrhage, groin wound infection, wound dehiscence and delayed healing
- B. **Late:** Leg edema, dyspareunia, femoral or inguinal hernia and recurrence of malignancy.

Q. Mention the lymphatic drainage of the vulva?

- Ans.** Vulval lymphatics communicate freely on either side.
- A. i) Labia majora (anterior half) → superficial inguinal nodes
- ii) Labia majora (posterior half) → superficial inguinal → deep inguinal → external iliac group of nodes.
- B. Labia minora, prepuce of clitoris → superficial inguinal nodes
- C. Glans clitoris → deep inguinal and external iliac nodes
- D. Bartholin's gland → superficial inguinal nodes
- E. Node of Cloquet: Located at the femoral canal, medial to the femoral vein. It receives lymphatic drainage from superficial inguinal nodes. May be absent in some.

Q. Significance of a sentinel node.

- Ans.** Sentinel node is the first node that drains a primary tumor. This node can be detected intraoperatively by lymphatic mapping.

Q. What are the prognostic factors?

- Ans.** a. Clinical stage (FIGO) of the disease
- b. Depth of stromal invasion
- c. Involvement of lymph nodes.

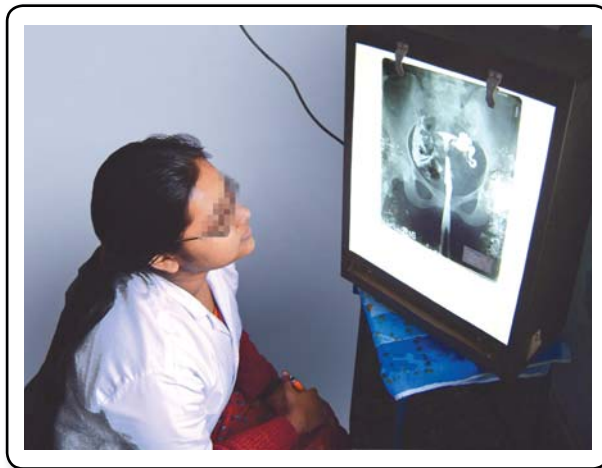
IMAGING STUDIES IN GYNECOLOGY

- **Hysterosalpingography**
- **Ultrasonography**
- **Computed Tomography (CT)**
- **Positron Emission Tomography (PET)**
- **Magnetic Resonance Imaging (MRI)**

Chapter Objectives

Basic knowledge and understanding with:

- Skiagram (X-ray images)
- Ultrasonogram
- Computed Tomograms (CT)
- Magnetic Resonance Images
- Rational use
- Diagnosis of pelvic pathology
- Interpretation of results
- Adverse effects (if any)



HYSTEOSALPINGOGRAM (HSG)

Fig. 16.71

Hysterosalpingogram showing radiopaque shadow demarcating the uterine cavity. The radiopaque dye is visible in the lumen of both the tubes. There is peritoneal spillage on both sides. The HSG cannula is in situ.

Diagnosis: Normal hysterosalpingogram (normal cavity) with bilateral patent tubes (free peritoneal spill).

Self-assessment:

- ♦ **Indications of HSG**
(see p 398)
- ♦ **Contraindications of HSG**
(see p 424 and 496)
- ♦ **Timing of HSG** (see p 495)
- ♦ **Steps of operation** (see p 424)
- ♦ **Complications** (see p 424 and 496)

Q. What is the next step of investigation in this case?

Ans. As the tubes are patent, the couple should be investigated to **assess** the **ovarian** (whether she is ovulating or not) and **male factors** (semen analysis) for **infertility**.

Q. What are the methods to detect ovulation?

Ans.

- Regular menstruation
- Basal Body Temperature–Biphasic pattern
- Cervical mucus study (loss of fern pattern in scraping)
- Vaginal cytology–progestational effect
- Levels of serum progesterone (rising level) at LH surge
- Endometrial biopsy: Secretory changes (D21–D23)
- Serial sonography: Detection of dominant follicle as other follicles collapse following ovulation.



Fig. 16.71: Hysterosalpingogram with bilateral peritoneal spillage

Fig. 16.72

Hysterosalpingogram showing radiopaque shadow demarcating the uterine cavity. No radiopaque shadow is visible in either tube.

Diagnosis: Hysterosalpingogram showing bilateral cornual block.

Self-assessment:

Q. What are the causes of cornual block?

Ans. Commonly it is due to infections. Genital tuberculosis often causes cornual block.

Q. What are the alternative investigations?

Ans. Alternative investigations for assessment of tubal patency are:

(a) Laparoscopic chromopertubation, (b) Sonohysterosalpingography

Q. What is the management if tubes are damaged?

Ans. If the tubes are damaged, assisted reproductive technology (ART) is the option. This may be in vitro fertilization and embryo transfer (IVF-ET).

Q. What are the results of tuboplasty?

Ans. Results of tuboplasty depend on the underlying pathology, method of tuboplasty (macro or microsurgery). Overall success rate following tubal anastomosis is 75%.

Q. What are the different methods of ART?

Ans. ♦ IVF-ET: In vitro fertilization and embryo transfer
♦ ICSI: Intracytoplasmic sperm injection.

Q. What is the management if tubes are normal?

Ans. To assess the male factor (semen analysis) and ovarian factor (detection of ovulation) for infertility.

Q. What other information can be obtained from HSG?

Ans. see p 424

Q. What are the causes of tubal block?

Ans. Salpingitis, salpingitis isthmica nodosa, benign polyps within the tubal lumen, tubal endometriosis, tubal spasm and intratubal mucous debris.



Fig. 16.72: Hysterosalpingogram showing bilateral cornual block. She had a history of MTP.

Fig. 16.73

Hysterosalpingogram showing radiopaque shadow filling the uterine cavity. The tubes of both sides are distended with the radiopaque dye. There is no evidence of peritoneal spillage.

Diagnosis: Bilateral hydrosalpinx (fimbrial block).

Self-assessment:

Q. *What are the causes of bilateral fimbrial block?*

Ans. Salpingitis (acute or chronic infection of the tube) is the common cause.



Fig. 16.73: Hysterosalpingogram showing bilateral hydrosalpinx (fimbrial block). Bilateral salpingostomy was done. Thereafter, she had an ectopic pregnancy

Q. *What is the management for proximal, distal and midtubal block?*

Ans. A. **Proximal tubal block** may be overcome by hysteroscopic cannulation. This is done using a hysteroscope.

B. **Distal tubal block** may be treated by:

- i. Fimbrioplasty
- ii. Fimbriolysis.

C. Midtubal block—tubotubal anastomosis may be done.

Q. *What is the appearance of the tube on HSG when infected with tuberculosis?*

Ans. The appearance on HSG are:

- (a) Vascular or lymphatic extravasation of dye
- (b) Rigid tubes with nodulations at places
- (c) Beaded appearance of the tubes
- (d) Coiling or clarification of tubes

Q. *What is the reproductive outcome in a woman with pelvic tuberculosis?*

Ans. Chances of conception in such a case is remote. Even if she conceives, the risk of ectopic pregnancy is high.

Q. Does the presence of hydrosalpinx impair the result of IVF?

Ans. Hydrosalpinges reduce the pregnancy rates of IVF by about 50%. Endometrial receptivity is reduced resulting in implantation failure. Salpingectomy improves the outcome.

Fig. 16.74

Hysterosalpingogram showing markedly dilated tube with retention of dye (right).

Diagnosis: Hydrosalpinx of the right tube.

Self-assessment:

Q. What are the other methods of diagnosis?

Ans. USG and laparoscopy.

Q. What are the dangers of HSG in such a case?

Ans. Risk of flaring up of pelvic infection is very high in such a case. Therefore HSG is contraindicated in a case with hydrosalpinx.

Q. What are the common types of tubal reconstructive surgery?

Ans. Different types of tubal reconstructive surgery are:

- (a) Salpingolysis, (b) Fimbrioplasty, (c) Salpingostomy, (d) Tubotubal anastomosis, (e) Tubocornual anastomosis.

Q. What factors are related to the success of tuboplasty?

Ans. Success of tubal reconstructive surgery depend upon the following factors:

- (a) Underlying pathology of the tube ; tubercular salpingitis has got poor outcome.
- (b) Presence of adhesions.
- (c) Presence of hydrosalpinx.
- (d) Length of the reconstructed tube is <4 cm.

Q. What are the guidelines for tubal surgery?

Ans. (a) Tubal surgery may be considered in young women with mild disease or after previous tubal sterilization.

(b) IVF is considered as the treatment option for the any complicated tubal occlusive disease.



Fig. 16.74: Hysterosalpingogram showing markedly dilated tube with retention of dye (right)

Fig. 16.75

Hysterosalpingogram showing a radiopaque shadow filling both the horns of the uterus. The radiopaque dye is visible within the tubes. There is peritoneal spillage on both the sides (Fig. 16.75).

Diagnosis: It seems to be a case of bicornuate uterus with bilateral patent tubes.

Self-assessment:

Q. How do you confirm a bicornuate uterus from septate uterus?

Ans. For confirmation one needs to see both the internal and external architecture of the uterus. Combined hysteroscopy and laparoscopy are helpful in this regard.

Q. How do you manage a case of septate uterus in recurrent miscarriage?

Ans. Hysteroscopic resection of the uterine septum is most effective. Successful pregnancy following hysteroscopic septum resection is about 90%.

- **Gynecological symptoms in bicornuate uterus** (see Dutta Gyne 6/e, p 45).

Q. What is the management of a bicornuate uterus?

Ans. It is difficult. Metroplasty or unification (Strassman or Tompkins) operation has been recommended.



Fig. 16.75: Hysterosalpingogram showing bicornuate uterus. Metroplasty was done for recurrent midtrimester miscarriage. Subsequently, she had a live birth at term, delivered by lower segment caesarean section (LSCS)

Fig. 16.76

Hysterosalpingogram showing a radiopaque shadow filling a single horn of the uterus. There is peritoneal spillage from the tube.

Diagnosis: It seems to be a case of unicornuate uterus with patent tube.

Self-assessment:

- Confirmation of diagnosis is by laparoscopic method of visualization.



Fig. 16.76: Hysterosalpingogram showing a unicornuate uterus

Q. What type of müllerian anomaly is this unicornuate uterus?

Ans. It is due to failure of development of the other müllerian duct

Q. What is the reproductive outcome with unicornuate uterus?

Ans. Often it is poor. This is due to poor uterine capacity, less muscle mass and inability to expand

Fig. 16.77

Hysterosalpingogram showing irregular filling of radiopaque dye without any outline of uterine tubes.

Diagnosis: Uterine synechiae (Asherman's syndrome).

Self-assessment:

Q. What are the common causes of uterine synechiae?

Ans. a. Excessive (over-zealous) curettage following abortion or childbirth

b. Excessive curettage in a case with DUB

c. Tubercular endometritis.

Q. What are the other methods of diagnosis?

Ans. Hysteroscopic visualization of the endometrial cavity is a useful method for the diagnosis. Adhesiolysis could be done at the same sitting hysteroscopically.

Q. What is the management of uterine synechiae?

Ans. Hysteroscopic adhesiolysis is to be done. This procedure may be followed by insertion of an intrauterine contraceptive device (IUCD) to prevent readhesion.

Q. What are the uterine causes of amenorrhea?

Ans. (a) MRKH syndrome

(b) Tubercular endometritis

(c) Uterine synechiae

(d) Surgical removal of uterus (hysterectomy)

(e) Postradiation.



Fig. 16.77: Hysterosalpingogram showing intra-uterine adhesion

Q. In what conditions of amenorrhea karyotyping is needed?

- Ans.** (i) Patients with uterus but no breasts and high FSH levels—Gonadal failure, (ii) Patients with no uterus but breasts present—Androgen insensitivity syndrome, (iii) Premature ovarian failure if < 30 years of age, (iv) Short stature (< 60") with Turner Stigmata—Turner's syndrome.

Fig. 16.78

Ultrasonographic view of a septate uterus.

Self-assessment:

Q. What are the different types of uterine abnormalities?

- Ans.** (a) Agenesis,
(b) Hypoplasia,
(c) Unicornuate uterus,
(d) Bicornuate uterus,
(e) Didelphys uterus,
(f) Septate uterus,
(g) Arcuate uterus.

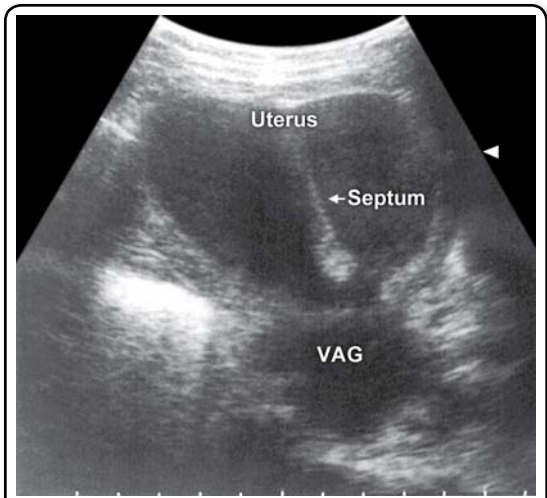


Fig. 16.78: Ultrasonographic view of a septate uterus

Q. What may be the clinical presentation of such a case?

- Ans.** Clinical presentation varies with the type of abnormalities. Sometimes it may remain asymptomatic.

Gynecological:

- (a) Infertility, (b) Menstrual abnormalities (menorrhagia).

Obstetrical:

- (a) Miscarriage (may be recurrent), (b) Cervical incompetence, (c) Preterm labor.

Q. What are the different obstetric complications?

- Ans.** See p 463, Fig. 15.58

Q. What are the different modes of diagnosis?

- Ans.** Different combinations of methods are done:

- (a) Hysterosalpingography
(b) Hysteroscopy
(c) Laparoscopy

- (d) Ultrasonography (3D)
- (e) Magnetic resonance imaging (MRI).

Q. What are the treatment options available?

Ans. Many cases do not need any surgical intervention: Few cases may need:

- (a) Hysteroscopic metroplasty (septal resection)
- (b) Excision of rudimentary horn
- (c) Unification operation (bicornuate uterus).

Fig. 16.79

Self-assessment:

Q. What are the causes of symmetrical enlargement of the uterus?

Ans.

- (a) Pregnancy
- (b) Submucous or intramural (solitary) fibroid, Adenomyosis
- (c) Hematometra
- (d) Pyometra.

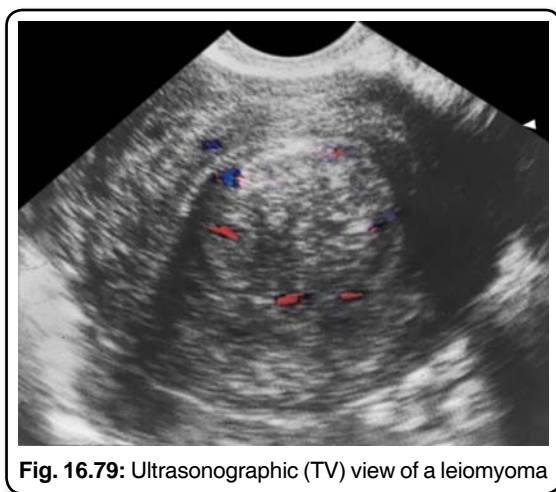


Fig. 16.79: Ultrasonographic (TV) view of a leiomyoma

Q. How a couple should be counselled before proceeding to myomectomy?

Ans. The operation should be done for preservation of reproductive function:

- (a) Myomectomy should be done for preservation of reproductive function
- (b) Pregnancy rate following myomectomy is about 40–60%.
- (c) Myomectomy is a more risky operation specially when fibroid(s) are too big or too many.
- (d) Risk during operation: Hemorrhage.
- (e) Remote complications are: Persistence of menorrhagia, recurrence of fibroid and risks of relaparotomy.

Q. What are the drugs used to control menorrhagia?

- Ans.** (a) Antiprogesterones (mifepristone) (b) Danazol
 (c) GnRH analogs (d) LNG IUS
 (e) Prostaglandin synthetase inhibitors (mefenamic acid).

Q. What are the principal steps of myomectomy?

- Ans.** (a) Uterine incision: A linear midline incision is made on the anterior wall.
(b) Incision is deepened through the myometrium, and the capsule to reach the myoma.
(c) The myoma is grasped with a single toothed vulsellum. The dissection is continued. Myoma is enucleated from its capsule by sharp and blunt dissection. The fibroid is removed.
(d) Myoma bed is closed by interrupted mattress sutures.

Q. What are the measures that can be adopted to minimise blood loss during myomectomy operation?

Ans. During operation:

- (a) Local injection of vasopressin over the myoma
- (b) Use of tourniquet—to occlude the uterine vessels
- (c) Use of Bonny's myomectomy clamp.

Q. What are the different methods of surgery?

- Ans.** (a) Laparotomy
(b) Laparoscopy
(c) Hysteroscopy
(d) Others—myolysis, radiology intervention (embolotherapy).

Q. What are the different types of surgery for myomectomy?

Ans. (see p 319)

Q. What are the common complications of myomectomy?

Ans. (see p 438).

Q. What are the long-term results of myomectomy in respect of recurrence and others?

Ans. Risk of recurrence: 30 to 50 percent

Persistence of hemorrhage: 1 to 5 percent

Risk of relaparotomy: 20 to 25 percent.

Fig. 16.80

Fig. 16.80: Sonographic view of adenomyosis showing diffusely enlarged uterus with cystic spaces

Self-assessment:

Q. *What are the different modalities of treatment options for pelvic endometriosis?*

Ans. (a) Expectant (observation only)

(b) Medical therapy

- Hormones
- Others

(c) Surgery

- Conservative
- Definitive

(d) Combined therapy

- Medical followed by surgical and surgical followed by medical therapy.

Q. What are the common sites of pelvic endometriosis?**Ans.** Common sites are:

- Ovaries
- Pelvic peritoneum
- Pouch of Douglas
- Rectosigmoid septum.

Q. Mention the indications and the different types of surgery that can be done for endometriosis?**Ans.** Indications of surgery are:

- Endometriosis with severe symptoms not responding to hormone therapy.
- Advanced stage disease to restore pelvic anatomy.
- Endometriomas > 1 cm.

Q. How do you manage a case of chocolate cyst (ovarian endometrioma) of the ovary?**Ans.** (a) Small endometrioma < 3 cm—laparoscopic cyst aspiration and cyst wall epithelium is destroyed by diathermy or laser.

(b) Large endometrioma ≥ 4 cm ovarian cystectomy with adhesiolysis.

Q. What are the different hormones used in the management of endometriosis?**Ans.** Combined oral pills, progestogens (oral, IM or IUCD), danazol, gestrinone or GnRH analogues.**Q. What is the treatment of scar endometriosis?****Ans.** It is done by excision of the endometriotic nodule in the scar tissue.**Q. How fibroid uterus could be differentiated from adenomyosis?****Ans.**

| Differentiating features of fibroid uterus and adenomyosis | | |
|---|---|---|
| | Fibroid uterus (Fig. 16.79) | Adenomyosis (Fig. 16.80) |
| Age | • Usually observed in the reproductive age | • Commonly seen in women older than 40 years |
| Pathology | • It is the benign neoplasia of the smooth muscle and fibrous tissue of the uterus | • It is due to the presence of functioning endometrium within the muscle layers of the uterus |
| Uterus | • Irregularly enlarged depending upon the site, size and number of myomas. It is firm and nontender (unless degeneration) | • Diffusely enlarged due to myohyperplasia. Uterus is soft and tender |
| Symptoms | • Menorrhagia and dysmenorrhea—often present | • Menorrhagia—present. Dysmenorrhea often begins a week before and it continues even after the period is over |

Contd...

Contd...

| | | |
|------------------|--|---|
| Diagnosis | <ul style="list-style-type: none"> • Sonography (TVS) — Homogeneous echogenic area over the fibroid • Cut section: <i>Capsule</i> present, smooth and whitish surface with whorled appearance • Histology: Proliferation of smooth muscle and fibrous tissue | <ul style="list-style-type: none"> • Cystic spaces within the myometrium. • MRI low signal intensity junctional zone (JZ) thickness ≥ 12 mm is suggestive of adenomyosis • <i>Capsule</i> absent. Diffuse trabeculated appearance, cystic spaces with hemorrhagic spots • Proliferation of endometrial glands and stroma. Phagocytic cells laden with hemosiderin pigment are present |
|------------------|--|---|

Fig. 16.81

Ultrasonographic view of Cu T inside the uterine cavity. Thread was missing in this case.

Self-assessment:

Q. What are the possible causes of missing thread?

Ans.

- Thread coiled inside
- Threads torn and expelled out
- IUCD expelled out unnoticed
- Perforation of the uterus
- Pregnancy when the threads are drawn inside the uterus.

Q. How do you investigate such a case with missing thread?

Ans.

- Ultrasonography can locate IUCD in the abdominal cavity or within the uterine cavity.
- Hysteroscopy can help in direct visualization and can remove it at the same time.

Q. What are the indications of removal of IUCDs?

Ans. (a) Missing thread



Fig. 16.81: Ultrasonographic view of a Cu T inside the uterine cavity, in a case of missing thread

- (b) Persistent pelvic pain
- (c) Persistent menorrhagia
- (d) Woman desirous of pregnancy

Q. What are the complications of IUCD use?

Ans. A. Immediate

- (a) Cramp-like pain
- (b) Perforation of the uterus
- (c) Syncopal attack.

B. Remote

- (a) Pelvic pain
- (b) Abnormal bleeding
- (c) Pelvic infection
- (d) Perforation of the uterus.

Q. What are the specific advantages of the third generation of IUCDs over the others?

- Ans.** (a) Higher efficacy
(b) Longer duration of action
(c) Low expulsion rate
(d) Reduced risk of ectopic pregnancy
(e) Reduced risk of PID.

Q. Mention some of the noncontraceptive benefits of LNG-IUCD?

- Ans.** (a) Reduction of menorrhagia, dysmenorrhoea
(b) Used in the management of endometrial hyperplasia
(c) Used as an alternative to hysterectomy for menorrhagia
(d) Used as hormone replacement therapy.

Fig. 16.82

Ultrasonographic view of an ovarian hyperstimulation syndrome (OHSS). Multiple follicles are seen.

Self-assessment:

Q. *What are the different grades and the clinical features of OHSS?*

Ans. Ovarian hyperstimulation syndrome (OHSS) could be of three grades depending upon severity (a) mild (10–20%), (b) moderate (5–10%), and (c) Severe (1–2%).

Q. *How the woman usually presents?*

Ans. The woman usually presents with: Abdominal pain, nausea vomiting, ascites, ARDS, oliguria, renal failure and raised WBC count ($> 15000/\text{mL}$).

Clinical features: Clinical features are nausea, vomiting, pain abdomen, ascites, ARDS, Oliguria, renal failure, liver dysfunction and thromboembolism.

Q. *How could this problem be prevented?*

Ans.

- (a) Low dose gonadotropins use
- (b) Close monitoring of super ovulation cycles
- (c) Not to be use ovulatory dose of hCG in susceptible cases.

Q. *What are the indications of gonadotropins use in infertility?*

Ans. Indications are:

- (a) Hypogonadotropic hypogonadism
- (b) Clomiphene failed or resistant cases
- (c) Unexplained infertility
- (d) Subfertile women who are elderly (>35 year).

Q. *What is ovarian reserve?*

Ans. It means the quantity as well as the quality of follicles present in the ovary.

**Fig. 16.82:** Sonographic view of OHSS

Q. Who are the high responders ?

Ans. High responders are those who have exaggerated response in follicular development when follicular stimulation is done.

Q. What is coasting?

Ans. It is done in high responders to prevent OHSS. Gonadotropin stimulation is stopped. GnRH agonist is continued. Once the level of estradiol is within normal range, hCG is given.

Q. How do you manage a case of OHSS?

- Ans.** (a) To monitor the patient within complete haemogram, LFTs, RFTs, coagulation profile and urine output.
- (b) Oral fluids to continue.
- (c) Abdominal paracentesis to relieve respiratory distress.
- (d) Human albumin may be given.
- (e) Intensive care management may be needed.
- (f) Surgery is rarely indicated.

Fig. 16.83

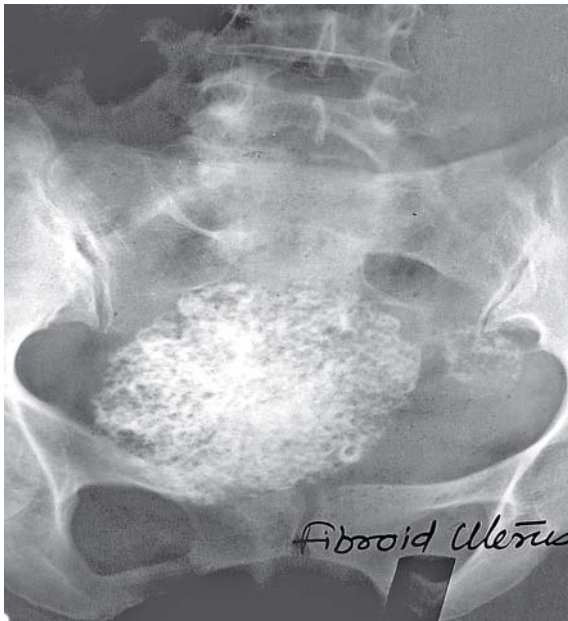


Fig. 16.83: Plain X-ray of the pelvis and lower abdomen showing the calcific degeneration of a fibroid (popcorn appearance).

[By courtesy: Dr P Panigrahi Senior Consultant Gynecologist, JLN Hospital, Bhilai]

Fibroid Uterus

Self-assessment:**Q. What are the secondary changes in a fibroid?**

- (a) Degenerations: Hyaline, cystic, calcific and red degeneration
- (b) Infection
- (c) Atrophy
- (d) Necrosis
- (e) Sarcomatous change.

Q. What are the degenerations in fibroid?

- Ans.**
- (a) Hyaline degeneration is the most common.
 - (b) Cystic degeneration is seen in menopause. Cystic spaces are seen within the fibroid.
 - (c) Fatty degeneration.
 - (d) Calcific degeneration (10%). The whole of fibroid changes into a calcific mass, called as 'womb stone'.
 - (e) Red degeneration usually seen in pregnancy and puerperium. It is vascular in origin. It is often associated pain abdomen.
 - (f) Atrophy—usually occurs in menopause.
 - (g) Necrosis—may occur due to inadequate vascular supply.
 - (h) Infection is commonly seen in submucous fibroid.
 - (i) Sarcomatous change occur in <0.1% of cases.

Fig. 16.84

Computed tomographic view of an ovarian tumor.

Self-assessment:**Q. What special advantages CT has got in gynecology?**

- Ans.** CT can be useful in staging of ovarian carcinoma as it can detect peritoneal, omental and serosal deposits. It is superior to ultrasound.

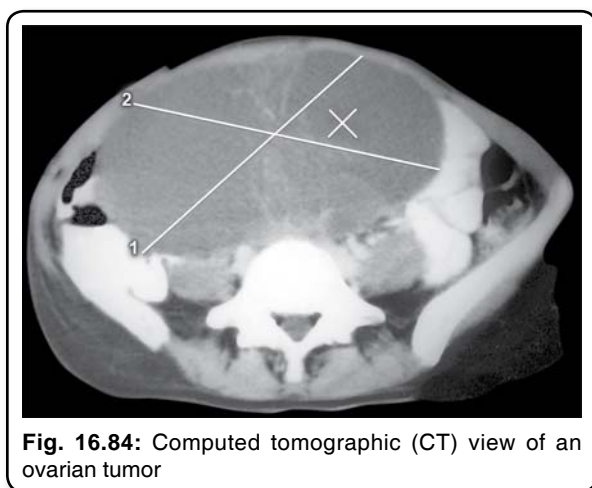


Fig. 16.84: Computed tomographic (CT) view of an ovarian tumor

Q. What is the place of sonography and positron emission tomography (PET) in the management of ovarian malignancy?

Ans. USG specially color Doppler sonography can detect the blood flow velocity within the tissues. Presence of mural nodules, papillary excrescence, solid components suggest malignancy.

PET: It is more sensitive and specific detection for metastatic disease and recurrence of ovarian or cervical malignancy. It is superior to CT or MRI.

Q. How magnetic resonance imaging (MRI) is useful as a diagnostic tool in gynecology?

Ans. see p 567

Q. What is the limitation of USG?

Ans. Compared to CT or MRI, USG is not sufficient for accurate staging of any pelvic malignancy.

Q. What is the value of CT in the evaluation of pelvic or periaortic lymph node metastasis?

Ans. For most pelvic malignancies lymph nodes more than 8 mm in maximum short axis dimension (MSAD) are regarded as abnormal. CT is helpful to detect retroperitoneal metastatic nodes. However, results may be false-negative due to micrometastasis or false-positive due to lymphadenitis or reactive hyperplasia.

Fig. 16.85

Description: It is a skiagram of the pelvis showing radiopaque shadow (tooth). Most likely it is a dermoid cyst of the ovary.

Self-assessment:

Q. Describe the cut section of an ovarian dermoid cyst

Ans. On cut section—mainly sebaceous material found. There is a solid area which often contains hair, bones, cartilage or teeth

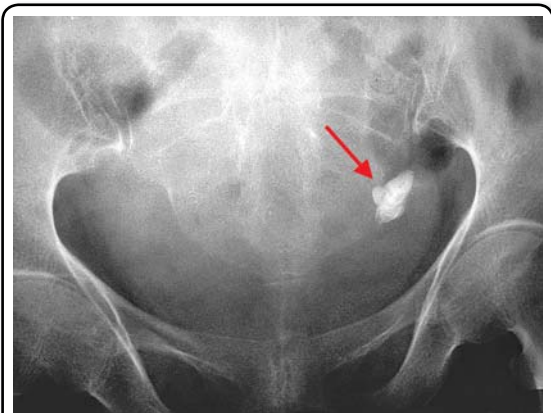


Fig. 16.85: Straight X-ray of the pelvis showing a tooth within an ovarian dermoid

Q. What is the risk of malignancy in a dermoid cyst of the ovary?

Ans. About 1–2%.

Q. What is struma ovarii?

Ans. Struma ovarii is composed of thyroid tissue. It is a rare variety of ovarian tumor.

Fig. 16.86

Q. Describe typical findings of an ovarian dermoid cyst in CT.

Ans. Characteristics of a dermoid cyst in CT include the mixture of low density areas due to fat, high density areas from dental elements or calcification (arrow) and a fat-fluid level.



Fig. 16.86: Showing fat, fat-fluid level of dental element (arrow)

Fig. 16.87

Self-assessment:

Q. How normal endometrium and myometrium could be studied with MRI?

Ans. With MRI endometrium is shown as the inner zone of high-signal-intensity stripe. The deeper myometrium is recognized as a very-low-signal intensity zone. The junctional zone demarcates the two (Fig. 16.87). The myometrium appears as the intermediate signal-intensity zone. In post-menopausal women, the contrast between the junctional zone and the myometrium decreases.

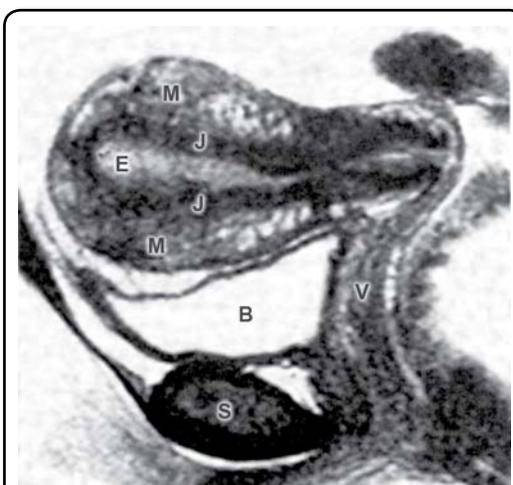


Fig. 16.87: MRI plate of a normal uterus on a sagittal T2-weighted spin-echo image showing endometrium (E), the junctional zone (J), the myometrium (M), urinary bladder (B) and the vagina (V).

Q. What special advantages MRI has got in gynecology?

- Ans.**
1. MRI offers multiplanar images.
 2. Gadolinium enhanced T₂-weighted images can determine.
 - i. Depth of myometrial invasion and that of pelvic and periaortic (retroperitoneal) nodal metastasis in endometrial carcinoma.
 - ii. Invasion of malignant process in the cervix accurately.
 - iii. It can detect recurrence of pelvic tumor.
 - iv. It is superior to CT in detecting metastatic nodes.
 3. MRI is safe in pregnancy.

DRUGS IN GYNECOLOGY

- **Clomiphene Citrate (CC)**
- **Letrozole**
- **Danazol**
- **Progesterone (PGN)**
- **Combined (Oestrogen And Progesterone) Oral Contraceptive Preparations (Coc)**
- **Tranexamic Acid**
- **Metformin**
- **Methotrexate**
- **Cisplatin/Carboplatin**

Chapter Objectives

To demonstrate the knowledge and understanding of :

- Commonly used drugs, indications, contraindications and the side effects
- Hormonal preparations including combined oral pills
- Anticancer drugs

DRUGS IN GYNECOLOGY

CLOMIPHENE CITRATE (CC)

Clomiphene Citrate (CC): It is the drug used for induction of ovulation.

Indication: Women suffering from anovulatory infertility.

Dose: It is prescribed 50 mg once or twice daily between D3 and D7 of the cycle (5 days).

Mechanism of action: Clomiphene citrate (CC) is an antiestrogenic as well as weakly estrogenic. It causes increased gonadotropin secretion. Ovulation is expected to occur 5–7 days after the last day of therapy.

Result: Successful ovulation rate is as high as 90%, but pregnancy rate is about 50%

Side effects: Hot flushes, nausea, visual symptoms and ovarian hyperstimulation (rare).

LETROZOLE

Letrozole is used for ovulation induction. It inhibits the enzyme aromatase. It suppresses estrogen synthesis. It is given 2.5 mg once or twice daily D₃–D₇ of the cycle. Pregnancy rate is similar or better than that of clomiphene. Multiple pregnancy rates are low.

DANAZOL

Danazol is an isoxazole derivative of 17- α ethinyl testosterone. It is strictly an anti-gonadotropin but also has androgenic action.

Mechanism of action: It suppresses the frequency of GnRH pulses \rightarrow suppression of pituitary Follicular stimulating hormone (FSH) and Luteinizing hormone (LH) surge. Serum estrogen (estradiol) level is reduced.

Indications of use: Endometriosis, DUB, symptomatic fibroid, precocious puberty (see Dutta Gynecology 6/e, p 51) and premenstrual tension syndrome.

Side effects are: Acne, weight gain, hirsutism and hot flushes.

PROGESTERONE (PGN)

PGN is a natural hormone (C-21 steroid) produced mainly by the corpus luteum of the ovary. Placenta is another major source during pregnancy.

Synthetic progestones (progestins) are available.

Commonly used progestones are:

- A. Natural: Progesterone.
- B. Synthetic: Progestins = Medroxy progesterone, norethisterone, levonorgestrel, gestodene.

Uses in gynecology:

1. **Progesterone challenge test**—done in cases with pathological amenorrhea. Medroxy progesterone 10 mg daily for 5 days is given orally.
2. **Contraception:**
 - (a) Mini pill
 - (b) Combined oral pill
 - (c) DMPA
 - (d) LNG—IUS (IUCD)
 - (e) Implant
3. **Endometriosis**—Progestins cause atrophy of the ectopic endometrial tissues.
4. **Endometrial hyperplasia** and endometrial carcinoma.
5. **Luteal support**—Micronized progesterone is used as vaginal suppository or given orally 200 mg twice daily.

COMBINED (OESTROGEN AND PROGESTERONE) ORAL CONTRACEPTIVE PREPARATIONS (COC)

- Uses:**
1. Contraception
 2. Dysfunctional uterine bleeding
 3. Endometriosis
 4. Dysmenorrhea
 5. Hirsutism.

Q. When to start a pill for the purpose of contraception?

Ans. New users should normally start a pill packet on D-1 of the cycle. Next pack should be started on the 8th day (same day of the week the pill finished, irrespective of the bleeding)

Q. When to use additional contraception?

Ans. To ensure efficacy, additional method (condom) may be used when other drugs are used. These drugs are: (a) Broad spectrum antibiotics (ampicillin), (b) Enzyme inducers (rifampicin, nevirapine).

Q. What are failure rates of the commonly used contraceptives?

Ans.

| Methods | Pregnancy rate per 100 women year |
|-------------------------------------|-----------------------------------|
| CuT 380A | 0.8 |
| LNG 20 | 0.1 |
| Combined Oral Contraceptives (COCs) | 0.1 |
| Norplant | 0.05 |
| Implanon | 0.01 |
| Vasectomy | 0.15 |
| Tubectomy | 0.15 |

Q. What are the Contraindications of COCs?**Ans.**

| Absolute | | Relative | |
|----------|--------------------------------------|----------|----------------|
| a. | Arterial and venous thrombosis | a. | Age >40 |
| b. | Severe hypertension | b. | H/O Jaundice |
| c. | Valvular heart disease | c. | Hyperlipidemia |
| d. | Diabetes with vascular complications | d. | Breast feeding |
| e. | Pregnancy | e. | Diabetes |
| f. | Undiagnosed genital tract bleeding | | |
| g. | Smoker >35 years | | |

Q. How do you counsel a woman when she misses her pill (s)?

Ans. When she missed one pill in the row, she is advised to take the missed pill as soon as she remembers it (within 24 hours). She should take the rest as per schedule.

Q. When she missed two pills

Ans. A. In the first week.

- ♦ She should take 2 pills at each of the next two days and continue the rest as scheduled.
- ♦ At the same time she should also take extra precaution for the next 7 days (either to use condom or avoid sex)

B. In the 3rd week (D15-D21) or more than two active pills are missed at any time

- ♦ To use another method of contraception for next 7 days (to use condom or avoid sex)
- ♦ Next pack to start without a break.

TRANEXAMIC ACID

It is an antifibrinolytic agent. It is an analog of amino caproic acid (ACA). It blocks the conversion of plasminogen to plasmin. It is used in cases with abnormal uterine bleeding (menorrhagia), bleeding following IUCD use (and after prostatic surgery). It reduces menstrual blood loss by 50 percent. It counteracts the endometrial fibrinolytic system (Fig. 16.88).

Dose schedule: Loading dose 15mg/kg orally, followed by 30mg/kg orally every 6 hours.

Contraindications: It should not be used in cases with disseminated intravascular coagulopathy

Side effects: Gastrointestinal; nausea diarrhea, abdominal discomfort; Others: postural hypotension and intravascular thrombosis.



Fig. 16.88: Tranexamic Acid

METFORMIN

Metformin is a biguanide group of drug. It reduces hepatic glucose production. It improves peripheral glucose utilization by increasing insulin sensitivity. **It is used as an insulin sensitizer in cases with polycystic ovarian disease who are often insulin resistant.** These women suffer from anovulation and infertility. Metformin is found to reduce hyperinsulinemia and hyperandrogenemia. Ovulation induction is more successful when CC or letrozole is combined with metformin. Metformin is given in a dose of 500 mg twice or thrice daily. It does not induce hypoglycemia in a normal individual.

Side effects: Anorexia, epigastric discomfort, diarrhea and lactic acidosis (rare).

METHOTREXATE

Methotrexate is an folic acid antagonist. It prevents reduction of folic acid to folinic acid by inhibiting the enzyme dihydrofolate reductase.

Indications:

1. Management of persistent GTN
2. Choriocarcinoma
3. Medical management of tubal ectopic pregnancy
4. Management of ovarian germ cell cancers.
5. Management of cases with morbid adherent placenta following delivery, to inhibit growth of trophoblastic tumor cells.

Side effects: Nausea, vomiting, oral ulceration, stomatitis, alopecia, anemia and hepatitis.

CISPLATIN/CARBOPLATIN

These are the platinum group of compounds. Platinum group of drugs is most effective against epithelial ovarian cancer.

Mechanism of action: Like alkylating agents, they cause cross linkage of DNA strands and prevent cell division. They may be used in combination with paclitaxel. Carboplatin is less toxic compared to cisplatin.

Side effects: Nausea, vomiting, anemia, granulocytopenia, azotemia, renal failure, compared to cisplatin and carboplatin has less toxicity.

CHAPTER

17

Single Best Answer and Multiple Choice Questions

Chapter Objectives

Total 329 SBAs and MCQs in gynecology, are there for comprehensive revision of subject with added explanations.

- It is a good practice area to test individual's level of knowledge.
- To detect area of weakness and to make it up.

- **Single Best Answer (SBA)**
- **Multiple Choice Questions (MCQs)**

QUESTIONS

Q.01 *The following are in relation with pudendal artery except:*

- a. It is a branch of anterior division of internal iliac
- b. One of its branches is middle rectal artery
- c. Its main supply is to the perineal and vulval structures
- d. It anastomoses with superficial and deep pudendal arteries, branches of femoral artery.

Q.02 *Cytohormonal maturation index of a woman during a menstrual cycle (28 day ovulatory cycle) and life time, is as mentioned except:*

- a. Day 5—0/50/50
- b. Day 14—0/40/60
- c. Day 28—0/70/30
- d. Childhood 80/20/0

Q.03 *Regression of the corpus luteum starts from:*

- a. Just prior to menstruation
- b. 4–6th day prior to menstruation
- c. With the onset of menstruation
- d. After the menstruation

Q.04 *The following statements are related to Bartholin's gland except:*

- a. Bartholin cyst is usually located in the duct or ductules
- b. Marsupialization is a quite effective surgery
- c. Incision is made on the outside skin
- d. Complete excision of the gland is needed in 10–15% due to recurrence

Q.05 *Physiological leukorrhea occurs during all these situation except:*

- a. Pre-menstrual phase
- b. Mid-menstrual phase
- c. Mini pill users
- d. During pregnancy

ANSWERS

Ans 1. (b). Middle rectal artery is one of the visceral branches of anterior division of internal iliac artery. One of the branches of the pudendal artery is inferior rectal.

Ans 2. (a). Estrogenic effect is much less on day 5, as such maturation index should be ideally 0/60/40.

Ans 3. (b). See Dutta Gyne. 6/e, p. 87.

Ans 4. (c). Incision is made on the vaginal mucosa below the hymenal ring.

Ans 5. (c). The mucus becomes thick and viscid.

QUESTIONS

Q.06 *The following are related to Trichomonas vaginitis except:*

- a. It is a sexually transmitted disease
- b. The organism is a flagellated parasite
- c. The discharge is curdy white with flakes
- d. Strawberry appearance of the posterior fornix and the cervix is characteristics

Q.07 *Preferred method for collection of material for cyto hormonal study is:*

- a. Scrapping from the upper one-third of lateral vaginal wall
- b. Vaginal pool specimen by pipette
- c. Cervical scrapping
- d. Scrapping from lower third of vagina

Q.08 *The following are related to Monilial vaginitis except:*

- a. The causative organism is *Candida albicans*
- b. Recurrence rate following initial cure is very low
- c. The relative concentrations of lactobacilli and *Candida albicans* in the vagina are inversely related
- d. Associated with hormonal factors, depressed immunity and antibiotic use

Q.09 *The following are associated with carcinoma cervix except:*

- a. Early sexual intercourse
- b. Use of condom
- c. Combined oral pills
- d. HPV 31, 45 infection

Q.10 *The commonest cause of death in cancer cervix is:*

- a. Renal failure following ureteric obstruction
- b. Hemorrhage
- c. Sepsis
- d. Hepatic failure

ANSWERS

Ans 6. (c). The discharge is frothy, yellowish and offensive. (see Dutta Gyne 6/e, p 163, 164)

Ans 7. (a). Contaminated cells from other sites are avoided. (see Dutta Gyne 6/e p 113).

Ans 8. (b). Recurrence rate varies from 20–80%.

Ans 9. (b). It is a protective factor. (see Dutta Gyne 6/e, p 322).

Ans 10. (a). See Dutta Gyne 6/e, p 346.

QUESTIONS

Q.11 *The early symptoms of carcinoma cervix are all except:*

- a. Intermenstrual bleeding
- b. Contact bleeding following coitus or vaginal examination
- c. Leukorrhea with often pinkish discharge
- d. Variable degrees of pain

Q.12 *The best procedure to diagnose carcinoma cervix following positive cytology is:*

- a. Four quadrant cervical biopsy
- b. Cone biopsy
- c. Ring biopsy
- d. Colposcopic directed biopsy

Q.13 *The following condition(s) is aggravated by the combined oral contraceptives is:*

- a. Hirsutism
- b. Endometriosis
- c. Premenstrual tension
- d. Cervical ectopy

Q.14 *Post-menopausal endometrial hyperplasia is due to hyperestrogenic state, the sources being:*

- a. Adrenal glands
- b. Hilus cells of the ovary
- c. Peripheral conversion of androgens
- d. All of the above

Q.15 *The preferred treatment of CIN-3/CIS in a parous woman aged 45 years is:*

- a. Hysterectomy
- b. Cold knife conization
- c. Cryosurgery
- d. Cauterisation

ANSWERS

Ans 11. (d). Pain is a late symptom of carcinom, indicating involvement of the parametrium. (see Dutta Gyne 6/e, p 345).

Ans 12. (d).

Ans 13. (d).

Ans 14. (d). Androstenedione from the adrenal glands and testosterone from the hilus cells of the ovary are peripherally converted into estrogen.

Ans 15. (a). See Dutta Gyne 6/e, p 329.

QUESTIONS

Q.16 *The following are related to submucous fibroid except:*

- a. It constitutes about 5% of all uterine fibroids
- b. Sarcomatous degeneration is less than in other variety of fibroid
- c. Even a small fibroid produces maximum symptoms
- d. Menorrhagia is the classic symptom

Q.17 *The following statements are related to degeneration of fibroid except:*

- a. Calcification occurs in the center of myoma of old women
- b. Infection commonly occurs in submucous fibroid
- c. Red degeneration is solely confined to pregnancy
- d. Fatty degeneration is quite rare

Q.18 *Diagnosis of a small submucous fibroid can be best done by:*

- a. Curettage with a feel of irregular 'bump'
- b. Hysterography
- c. Hysteroscopy
- d. Sonography

Q.19 *The following statements are related to salpingitis except:*

- a. Gonococcal infection is usually limited to endosalpinx
- b. Pyogenic infection involves whole thickness of the tube
- c. Tubercular infection involves all the layers of the tube
- d. Tubal infection is usually unilateral

Q.20 *Common modes of tubal infection are all except:*

- a. Gonococcal infection—by continuity and contiguity
- b. Pyogenic—through parametrial lymphatics
- c. Tubercular—by pelvic lymphatics causing perisalpingitis
- d. Chlamydia—colonize the cervix initially

ANSWERS

Ans 16. (b). See Dutta Gyne 6/e, p 273-274.

Ans 17. (c). Red degeneration can occur in puerperium. It is seen most often in the second trimester of pregnancy.

Ans 18. (c). See Dutta Gyne 6/e, p 279.

Ans 19. (d). Tubal infection is usually bilateral.

Ans 20. (c). Hematogenous infection leading to interstitial salpingitis.

QUESTIONS

Q.21 *The most reliable method of diagnosis of genital tuberculosis is:*

- a. Endometrial curettage in late secretory phase followed by histological and bacteriological examination
- b. Hysterosalpingography
- c. Hysteroscopy and laparoscopy
- d. PCR for nucleic acid amplification from specimen

Q.22 *Functional cyst of the ovary is characterized by:*

- a. It does not usually exceed 6 cm
- b. It may persist even after the cure of the functional disorder to which it is associated
- c. It is more associated with patient taking oral 'pill'
- d. It is usually multilocular

Q.23 *Pseudomyxoma peritonei is associated with all except:*

- a. Mucinous cystadenoma of the ovary
- b. Mucocele appendix
- c. Carcinoma gallbladder
- d. Carcinoma of the large bowel

Q.24 *Germ cell ovarian tumors are all except:*

- a. Choriocarcinoma
- b. Dysgerminoma
- c. Granulosa cell tumor
- d. Endodermal sinus tumor

Q.25 *The commonest site of pelvic endometriosis is:*

- a. Uterosacral ligament
- b. Ovary
- c. Rectovaginal septum
- d. Pelvic peritoneum

ANSWERS

Ans 21. (d). Genital TB is paucibacillary and smears and cultures are usually negative. PCR can detect even less than 10 organisms in a specimen. Histology is suggestive but not diagnostic. (see Dutta Gyne 6/e, p 140-141).

Ans 22. (a). See Dutta Gyne 6/e, p 289.

Ans 23. (c). It is associated with mucocele of gallbladder. (see Dutta Gyne 6/e, p 300).

Ans 24. (c). It is a sex cord stromal tumor. (see Dutta Gyne 6/e, p 291, Table 20.1).

Ans 25. (b).

QUESTIONS

Q.26 *Treatment of mild endometriosis in a patient aged 30 years with infertility is:*

- a. Symptomatic treatment to relieve pain.
- b. Producing pseudopregnancy state by using danazol (17α ethyl testosterone)
- c. Producing pseudomenopause by using combined 'pill'
- d. GnRH analogue monthly

Q.27 *Hysteroscopy is used for all except:*

- a. Removal of IUD
- b. Diagnosis of uterine polyp
- c. To take endometrial biopsy from the appropriate sites
- d. To confirm patency of the fallopian tube

Q.28 *The following statements are related to dermoid cyst of the ovary except:*

- a. It is the commonest of all ovarian teratomas
- b. It is bilateral in about 15%
- c. It may turn to malignancy
- d. It contains only ectodermal element

Q.29 *Elongation of the uterine cavity occurs in all except:*

- a. Pregnancy
- b. Fibroid
- c. Pyometra
- d. Prolapse

Q.30 *The cavity of the uterine body becomes smaller in all except:*

- a. Endometrial carcinoma
- b. Menopause
- c. Inversion
- d. Hypoplastic uterus

ANSWERS

Ans 26. (a). Danazol acts by producing pseudomenopause and combined pill acts by producing pseudopregnancy. There is no place of ovulation suppression by medical management for such a patient. There is no such well-controlled study to show the superiority of surgery or medical therapy over expectant management in mild or minimal endometriosis.

Ans 27. (d). See Dutta Gyne 6/e, p 621-622.

Ans 28. (d). Ectodermal, endodermal and mesodermal tissues are present.

Ans 29. (d). In prolapse, there is elongation of the supravaginal part of the cervix.

Ans 30. (a).

QUESTIONS

Q.31 *Scar endometriosis is most common except followings:*

- a. Abdominal hysterotomy for MTP
- b. Caesarean section
- c. Vaginal delivery with episiotomy
- d. Appendicectomy

Q.32 *The followings are related to scar endometriosis except:*

- a. It is always associated with pelvic endometriosis
- b. Implantation occurs through vascular and lymphatic dissemination
- c. It cannot be cured by hormone therapy
- d. Excision is usually followed by recurrence

Q.33 *Complete perineal tear occurs in all except:*

- a. Forceps delivery in undiagnosed occipito posterior
- b. Extension of mediolateral episiotomy
- c. Shoulder dystocia
- d. Precipitate labor

Q.34 *Rectovaginal fistula most commonly occurs in:*

- a. Congenital
- b. Following obstructed labor
- c. Carcinoma vagina
- d. A sequelae of repair of CPT

Q.35 *Diagnosis of dysfunctional bleeding may be confused with all except:*

- a. Small submucous fibroid
- b. Incomplete abortion
- c. Endometrial carcinoma
- d. Ovarian tumor

ANSWERS

Ans 31. (a). See Dutta Gyne 6/e, p 313

Ans 32. (c). See Dutta Gyne 6/e, p 305-313.

Ans 33. (b). It may occur as extension of central episiotomy. (see Dutta Gyne 6/e, p 431).

Ans 34. (d). See Dutta Gyne 6/e, p 427.

Ans 35. (d).

QUESTIONS

Q.36 *Irrespective of age, the best noninvasive method of control of bleeding in dysfunctional uterine bleeding:*

- a. Estrogen
- b. Androgen
- c. Progestogen
- d. D + C

Q.37 *The commonest site of contributing vaginal secretion is:*

- a. Tubes and uterus
- b. Cervix
- c. Vagina
- d. Bartholin's glands

Q.38 *Normal inhabitants of vaginal flora are all except:*

- a. Streptococcus
- b. Chlamydia
- c. Doderlein's bacillus
- d. Candida species

Q.39 *For cyto hormonal study which of the index is most informative?*

- a. Eosinophilic
- b. Karyopyknotic
- c. Cornification
- d. Maturation

Q.40 *The optimal pH for maintenance of active motile spermatozoa is:*

- a. 4.5–5.5
- b. 6–7
- c. 7.2–7.8
- d. 8–9

ANSWERS

Ans 36. (c). See Dutta Gyne 6/e, p 191.

Ans 37. (b).

Ans 38. (b).

Ans 39. (d). See Dutta Gyne 6/e, p 114, Table 9.4.

Ans 40. (c). See Dutta Gyne 6/e, p 232 Table 16.3

QUESTIONS

Q.41 *Regarding retroversion of the uterus:*

- a. Occurs in 20% of normal women
- b. It is a common cause of infertility
- c. May be corrected by Fothergill's operation
- d. It is caused by heavy lifting

Q.42 *Primary dysmenorrhea can be treated by all except:*

- a. Antiprostaglandins
- b. Cyclic combined estrogen and progestogen preparations
- c. Presacral neurectomy
- d. Uterine curettage

Q.43 *Germ cells arise from:*

- a. Germinal epithelium
- b. Yolk sac endoderm
- c. Wolffian duct
- d. Mullerian duct

Q.44 *The followings are developed from mesonephric duct:*

- a. Uterus
- b. Fallopian tubes
- c. Upper vagina
- d. None of the above

Q.45 *Complete failure of fusion of mullerian ducts results in:*

- a. Uterine didelphys
- b. Subseptate uterus
- c. Bicornuate uterus
- d. Absence of uterus

ANSWERS

Ans 41. (a).

Ans 42. (d). Curettage is not the treatment but dilatation of the cervix may be of help.

Ans 43. (b). See Dutta Gyne 6/e, p 38.

Ans 44. (d). All are developed from paramesonephric duct (Mullerian duct). See Dutta Gyne 6/e, p 39, Table 3.1.

Ans 45. (a). See Dutta Gyne 6/e, p 45.

QUESTIONS

Q.46 *The following are the chemotherapeutic drugs and the side effects — match them appropriately:*

- | | |
|---------------------|--------------------------------|
| a. Cyclophosphamide | 1. Renal failure |
| b. Cisplatin | 2. Myocarditis |
| c. Doxorubicin | 3. Oral ulceration (mucositis) |
| d. Methotrexate | 4. Hemorrhagic cystitis |

Q.47 *Causes of pyometra at the age of 35 are all except:*

- a. Infected lochiometra
- b. Infected polyp blocking the cervical canal
- c. Endocervical carcinoma
- d. Senile endometritis

Q.48 *Uterine synechiae is commonly due to all except:*

- a. Puerperal curettage
- b. Following cesarean section
- c. Tubercular endometritis
- d. Following IUCD insertion

Q.49 *Postmenopausal vaginal bleeding may be due to all except:*

- a. Urethral caruncle
- b. CIN 3
- c. Carcinoma of the fallopian tube
- d. Atrophic vaginitis

Q.50 *The followings are related to vesicovaginal fistula except:*

- a. Sloughing fistula is common where obstetric care is suboptimal
- b. Fistula following irradiation or malignancy is difficult to repair
- c. Even for a sloughing fistula, spontaneous closure is a possibility
- d. Chance of successful repair is best when repair is done immediately

ANSWERS

Ans 46. a = 4; b = 1; c = 2; d = 3.

Ans 47. (d). Senile endometritis is a problem of the postmenopausal lady.

Ans 48. (d). Rarely it occurs following myomectomy or even after insertion of IUCD when infection sets in. However, IUCD is used for treatment of synechiae (see Dutta Gyne 6/e, p 459).

Ans 49. (b). CIN is an asymptomatic lesion.

Ans 50. (d).

QUESTIONS

Q.51 *Regarding hydatidiform mole:*

- a. Best diagnosed by ultrasonography
- b. May present with small for date uterus
- c. Chromosomes are derived entirely from the mother
- d. Initial β -hCG levels $> 100,000$ IU/L is a risk factor for malignancy

Q.52 *Rectocele is confirmed by:*

- a. Bimanual examination
- b. Speculum examination
- c. Digital vaginal examination
- d. Rectal examination

Q.53 *Followings are the tumor characteristics — match them appropriately.*

- | | |
|--------------------------------|--|
| a. Dysgerminoma | 1. Often secrete oestrogen |
| b. Endodermal sinus cell tumor | 2. Highly radiosensitive |
| c. Granulosa cell tumor | 3. Carboplatin chemotherapy |
| d. Epithelial ovarian cancer | 4. β -hCG and α fetoprotein |

Q.54 *Surgical treatment options for chronic cervicitis may be:*

- a. Cauterization
- b. Cold knife conization
- c. Hysterectomy
- d. All of the above

Q.55 *The causes of retention of urine in female are all except:*

- a. Hematocolpos
- b. Fundal fibroid uterus
- c. Mucocolpos
- d. Retroverted gravid uterus

ANSWERS

Ans 51. a, b, d. Q.(c) : Complete moles have 46 XX, both of which are derived entirely from the father (see Dutta Gyne OSCE No.10, p. 300).

Ans 52. (d).

Ans 53. a = 2; b = 4; c = 1; d = 3.

Ans 54. (d).

Ans 55. (b). Cervical fibroid can cause retention of urine. (see Dutta Gyne 6/e, p 410, Table 24.8).

QUESTIONS

Q.56 *Regarding the drugs all are true except:*

- a. Mifepristone is antiestrogenic
- b. Oestrogen is antiandrogenic
- c. Estrogen is antigonadotropin
- d. Danazol is antigonadotropin

Q.57 *Regarding postpill amenorrhea is:*

- a. It is a common side effect of combined oral contraceptive pill (COC)
- b. It may be due to hyperprolactinemia
- c. It should be investigated without delay
- d. It is mostly due to prolonged use of pills

Q.58 *Sequelae of vaginal hysterectomy with PFR are all except:*

- a. Vault prolapse
- b. Dyspareunia
- c. Tender perineal scar
- d. Early menopausal symptoms

Q.59 *Mature graafian follicle measures:*

- a. 5–10 mm
- b. 15–20 mm
- c. 25–30 mm
- d. More than 30 mm

Q.60 *The followings are related correctly to embryology except:*

- a. Germ cells within the genital ridge are developed from the germinal epithelium
- b. Ovarian ligaments and round ligaments are developed from genital ligament (Gubernaculum)
- c. Clitoris is developed from genital tubercle
- d. Labia majora are developed from labioscrotal swelling

ANSWERS

Ans 56. (a). It is antiprogesterone.

Ans 57. (b). Amenorrhea following stoppage of COC is not a causal association. Overall incidence is less than 1% for duration of more than 6 months. Spontaneous resumption of menstruation occurs in majority by 6 months time. Amenorrhea persisting > 6 months should be investigated as any other case of secondary amenorrhea. Pituitary adenoma need to be excluded.

Ans 58. (d). As the ovaries are generally preserved, symptoms are not early.

Ans 59. (b). See Dutta Gyne 6/e, p 86.

Ans 60. (a). Germ cells are derived from the endoderm of yolk sac and they migrate to the genital ridge along the dorsal mesentery between 20 and 30 days.

QUESTIONS

Q.61 *Surest evidence of ovulation is:*

- a. Biphasic temperature chart
- b. Secretory endometrium
- c. Rapid enlargement of graafian follicle as detected by sonography
- d. Pregnancy

Q.62 *In relation to Bartholin's gland all are correct except:*

- a. It is a compound racemose gland
- b. It is partly covered by bulbospongiosus
- c. Its duct measures about 20 mm
- d. It lies deep to urogenital diaphragm

Q.63 *In relation to chromosomal pattern all are correct except:*

- a. 45 XO in classic Turner
- b. 47 XXX in so-called superfemale
- c. 46 XXY in Klinefelter's syndrome
- d. 47 XYY in Male YY syndrome (supermale)

Q.64 *The followings are related to broad ligament except:*

- a. The ovarian and round ligament are the homologue to the gubernaculum testis
- b. Mesosalpinx contains utero-ovarian anastomotic vessels
- c. Mesosalpinx contains numerous vestigial structures
- d. Gartner's duct is the persistent paramesonephric duct

Q.65 *The ovary is attached with all except*

- a. Ovarian ligament.
- b. Posterior leaf of the broad ligament.
- c. Infundibulopelvic ligament.
- d. Round ligament.

ANSWERS

Ans 61. (d). See Dutta Gyne 6/e, p 237.

Ans 62. (d). The Bartholin glands lie superficial to urogenital diaphragm in the superficial perineal pouch.

Ans 63. (c). The cytogenetic pattern of Klinefelter's syndrome is 47 XXY.

Ans 64. (d). It is the persistent Wolffian duct.

Ans 65. (d).

QUESTIONS

Q.66 *The followings are the sexually transmitted diseases except:*

- a. Trichomonas vaginitis
- b. Herpes simplex type 2 vaginitis
- c. Parvovirus B19
- d. Chlamydia trachomatis

Q.67 *The diagnosis of pelvic endometriosis is established by:*

- a. Congestive dysmenorrhea
- b. Painful defecation
- c. Nodular feel of the uterosacral ligaments
- d. Laparoscopy

Q.68 *Yellow color of the corpus luteum is due to:*

- a. Accumulation of fatty granules
- b. Vitamin A lipofuscin
- c. Cholesterol
- d. Carotene

Q.69 *The functions of LH are all except:*

- a. Activation of theca cells to produce progesterone
- b. Helps the physical act of ovulation
- c. Initiates luteinization of the granulosa cells
- d. Completion of first meiotic division and extrusion of first polar body

Q.70 *Vestigial structures in the broad ligament are all except:*

- a. Duct of Gartner
- b. Epoophoron
- c. Paroophoron
- d. Round ligament

ANSWERS

Ans 66. (c).

Ans 67. (d). See Dutta Gyne 6/e, p 308.

Ans 68. (d). See Dutta Gyne 6/e, p 87.

Ans 69. (a). LH stimulates theca cells for androgen precursor production which are converted into estrogens in the granulosa cells. (see Dutta Gyne 6/e, p 71).

Ans 70. (d). Round ligament and ovarian ligament are gubernaculum of the ovary.

QUESTIONS

Q.71 *Percentage of Barr bodies present in female out of 100 cells examined is:*

- a. More than 5%
- b. More than 15%
- c. More than 25%
- d. None of the above

Q.72 *These terms are related to semen analysis except:*

- a. Oligospermia means reduction in sperm count
- b. Asthenospermia means reduction in spermatozoa vitality
- c. Teratospermia means malformed sperm
- d. Necrozoospermia means deformed sperm

Q.73 *The vaginal pH in newborn approximates is:*

- a. 4.5
- b. 5.5
- c. 6.5
- d. None of the above

Q.74 *The invasive methods in the investigation of ovulation are all except:*

- a. Endometrial biopsy in late secretory phase
- b. Laparoscopic visualization of graafian follicles
- c. Sonographic measurement of graafian follicle
- d. Detection of ovum in the aspiration fluid from the pouch of Douglas

Q.75 *The most powerful antigonadotropin is:*

- a. Estrogen
- b. Progestogen
- c. Androgen
- d. Danazol

ANSWERS

Ans 71. (c).

Ans 72. (d). Necrozoospermia means spermatozoa are dead or motionless.

Ans 73. (a). The acidic pH is due to maternal estrogen.

Ans 74. (c).

Ans 75. (d).

QUESTIONS

Q.76 *In the evaluation of a subfertile male:*

- a. Seminal fluid pH of 7.7 is abnormal
- b. Asthenozoospermia may be due to Kartagener syndrome
- c. Testicular ultrasonography is no value
- d. Associated chromosomal abnormality is 10%

Q.77 *The following are related to the collection of material for PAP smear except:*

- a. Lubricants are avoided
- b. To make the slide dry before fixation
- c. To immerse the slide in a fixative containing 95% ether and alcohol
- d. Smears should be neither too thick nor too thin

Q.78 *The combined estrogen and progestogen preparations are used in present day practice except:*

- a. Oral contraceptives by suppressing gonadotropins
- b. Dysmenorrhea (intractable) by producing anovulation
- c. Endometriosis by producing pseudomenopause
- d. PCOS with hirsutism by reducing free testosterone level

Q.79 *The commonest use of combined estrogen and progestogen preparations:*

- a. Dysmenorrhea
- b. Endometriosis
- c. Diagnosis of pregnancy
- d. Oral contraception

Q.80 *Cervical ectopy can be effectively treated by:*

- a. Electrocauterization
- b. Cryosurgery
- c. Amputation of the cervix
- d. All of the above

ANSWERS

Ans 76. (b). Testicular USG can diagnose ejaculatory duct obstruction, small cysts and varicoceles. Associated chromosomal abnormality is about 2%.

Ans 77. (b). The slide should be immersed in the fixative promptly before it dries up.

Ans 78. (c). Its use in endometriosis is on the basis of producing pseudopregnancy and not pseudomenopause. (see Dutta Gyne 6/e, p 311, Table 21.6).

Ans 79. (d).

Ans 80. (d).

QUESTIONS

Q.81 *Asymptomatic puerperal ectopy should be treated by*

- a. Expectant management for about 3 months postpartum
- b. Electrocauterization
- c. Chemical cauterization
- d. Cryocauterization

Q.82 *The following statement (s) are related to uterine fibroid except:*

- a. Fibroids arising from the body of the uterus always have a capsule
- b. Blood supply of the fibroid usually comes from a single arterial source
- c. The cut surface of a fibroid looks concave
- d. None of the above

Q.83 *Level of serum CA 125 is raised in:*

- a. Epithelial ovarian cancer
- b. Adenomyosis
- c. Pancreatitis
- d. All of the above

Q.84 *Tubercular ulcer of the cervix should primarily be treated by:*

- a. Amputation
- b. Hysterectomy
- c. Antitubercular therapy
- d. Electrocauterization

Q.85 *The following statements are related to dysmenorrhea except:*

- a. Spasmodic dysmenorrhea is oestrogen related
- b. Fibroid is related to congestive dysmenorrhea
- c. Pre and co-menstrual dysmenorrhea is characteristic of pelvic endometriosis
- d. Congestive dysmenorrhea is usually secondary

ANSWERS

Ans 81. (a). In majority there is spontaneous regression.

Ans 82. (d). Submucous fibroid has got no capsule all through. Blood supply comes from multiple vessels from the capsule. The cut surface looks convex because of contraction of the muscles present in the capsule.

Ans 83. (d).

Ans 84. (c).

Ans 85. (a). Spasmodic dysmenorrhea is related to progesterone which causes synthesis and release of $\text{PGF2}\alpha$.

QUESTIONS

Q.86 *The definitive kidney is developed from:*

- a. Pronephros
- b. Mesonephros
- c. Metanephros
- d. None of the above

Q.87 *The isthmus of uterus measures by:*

- a. 2 mm
- b. 3 mm
- c. 4 mm
- d. 5 mm

Q.88 *Histologically, the labia minora contains by:*

- a. Hair follicles
- b. Sweat glands
- c. Sebaceous glands
- d. All of the above

Q.89 *Hidradenomas are tumors which originate in the sweat glands situated on all except:*

- a. Mons
- b. Labia majora
- c. Labia minora
- d. Perineum

Q.90 *The followings are the different parts of the broad ligament except:*

- a. Mesovarium
- b. Mesosalpinx
- c. Infundibulopelvic ligament
- d. Round ligament

ANSWERS

Ans 86. (c).

Ans 87. (d). The isthmus measures about 5 mm

Ans 88. (c). The labia minora is devoid of hair follicles or sweat glands.

Ans 89. (c). As because there is no sweat gland in labia minora, hidradenoma cannot develop.

Ans 90. (d).

QUESTIONS

Q.91 *Length of the round ligament is:*

- | | |
|----------|----------|
| a. 5 cm | b. 10 cm |
| c. 15 cm | d. 20 cm |

Q.92 *Distinction between bicornuate and septate uterus can be made most accurately by:*

- a. Hysterosalpingography (HSG)
- b. Bimanual examination to find the presence or absence of median raphe
- c. Laparoscopy.
- d. Combination of laparoscopy and hysteroscopy

Q.93 *The followings are related to Chlamydia trachomatis (C. trachomatis)*

- a. It is an obligate, intracellular bacteria
- b. The organism mainly affects the squamous epithelium
- c. Fitz-Hugh-Curtis syndrome is more due to Chlamydia than Gonococcus
- d. Symptoms include dysuria and postcoital bleeding

Q.94 *In relation to adrenal function tests*

- a. Positive dexamethasone suppression test rules out adrenocortical tumor
- b. The metyrapone test assesses pituitary reserve by means of adrenal suppression
- c. The rapid ACTH stimulation test is useful for the diagnosis of primary adrenal insufficiency
- d. All of the above

Q.95 *The followings are related to LH except:*

- a. Its function is predominantly steroidogenic and to a lesser extent morphogenic
- b. It has however no role in maturation of the ovum
- c. LH peak precedes progesterone peak
- d. Estrogen peak precedes LH peak

ANSWERS

Ans 91. (b). See Dutta Gyne 6/e, p 23.

Ans 92. (d). The combination of the knowledge of the internal and external uterine contour defines the precise nomenclature and the degree of the particular anomaly.

Ans 93. (a, c, d). Chlamydia affects the columnar and transitional epithelium.

Ans 94. (d). Q.(a) : Dexamethasone suppresses ACTH → diminishes adrenal glucocorticoids. Q.(b) : Metyrapone inhibits adrenal 11 β hydroxylase → reduced secretion of hydrocortisone → increased pituitary ACTH secretion. Q.(c): Aldosterone secretion is preserved in secondary adrenal failure by renin angiotensin system.

Ans 95. (b). LH stimulates the resumption of meiosis with extrusion of the first polar body shortly before ovulation.

QUESTIONS

Q.96 *Source of estrogen production is:*

- a. Adrenal
- b. Placenta
- c. Peripheral tissue
- d. All of the above

Q.97 *The followings are related to lactation except:*

- a. Pregnancy per se is not necessary for the initiation of milk flow
- b. An intact nerve supply is essential for the growth of the mammary glands during pregnancy
- c. Afferent neural arc is via T4–6 and the efferent arc is by oxytocin
- d. Inappropriate lactation (galactorrhea) is less common in patients with hyperprolactinemia

Q.98 *GnRH like hormonal activity has been discovered in the following sites:*

- a. Hypothalamus
- b. Placenta
- c. Pancreas
- d. All of the above

Q.99 *The followings are related to labia except:*

- a. Labia majora are homologous with the scrotum in male
- b. Labia minora contain numerous hair follicles
- c. Round ligaments terminate in the upper-third of labia majora
- d. Branches of femoral artery supply the vulva

Q.100 *The followings are related to the anatomy of vagina except:*

- a. Long axis of vagina almost lies parallel to the plane of the pelvic inlet
- b. Posterior vaginal wall is longer than the anterior wall
- c. The posterior fornix is deeper than the others
- d. The entire posterior wall is directly related to the rectum and anal canal

ANSWERS

Ans 96. (d). Ovarian and adrenal androstenedione can be converted to estrone in the peripheral tissue. This is an important site of estrogen production after menopause.

Ans 97. (b). Q.(d) : Galactorrhea is present in about 30% only.

Ans 98. (d). Although first identified in hypothalamus, it has also been found in the sites mentioned but its function in these tissues remain undetermined.

Ans 99. (b). Hair follicle is absent in labia minora.

Ans 100. (d). The middle-third of the vagina is related to rectum whereas the lower-third is separated from the anal canal by perineal body. (see Dutta Gyne 6/e, p 5).

QUESTIONS

Q.101 *Arterial supply of the vagina is derived from all except:*

- a. Uterine artery
- b. Vaginal artery
- c. Superior rectal artery
- d. Internal pudendal artery

Q.102 *The followings are related to vaginal secretion except:*

- a. The secretion is mostly derived from the cervix
- b. pH is about 4–5 during childbearing period
- c. It contains many pathogens including clostridia
- d. Glycogen content is highest in the lower third

Q.103 *The followings are related to the crossing of uterine artery and ureter except:*

- a. The crossing occurs about 1.5 cm. away at the level of internal os
- b. The ureter crosses the uterine artery posteriorly
- c. The uterine artery crosses the ureter from above and in front
- d. The crossing occurs just after the ureter enters the ureteric tunnel

Q.104 *The followings are related to the fallopian tube except:*

- a. Length measures about 10 cm
- b. Isthmus measures about 2.5 cm
- c. Uterine ostium measures 1 mm in diameter
- d. There is shedding of tubal epithelium during menstruation

Q.105 *The followings are in relation to ovarian attachment except:*

- a. The ovary lies intraperitoneally
- b. It is attached to the broad ligament by the mesovarium
- c. Attached to the lateral wall by infundibulopelvic ligament
- d. Attached to the uterus by the round ligament

ANSWERS

Ans 101. (c). It should be middle or inferior. Superior rectal is a branch of inferior mesenteric artery. (see Dutta Gyne 6/e, p 26-27).

Ans 102. (d). The glycogen content is highest in the upper-third of vagina.

Ans 103. (d). The ureter is crossed by the uterine artery prior to its entrance into the ureteric tunnel (see Dutta Gyne 6/e, p 15).

Ans 104. (d). There is no shedding (see Dutta Gyne 6/e, p 10-11).

Ans 105. (d). The ovary is attached to the uterus by the ovarian ligament (see Dutta Gyne 6/e, p 11).

QUESTIONS

Q.106 *The followings are related to urethral (female) anatomy except:*

- a. The length is about 4 cm
- b. The lining epithelium is transitional and at the meatus stratified squamous
- c. The arterial supply is from inferior vesical and internal pudendal
- d. Nerve supply is entirely from pudendal

Q.107 *The followings are the changes in the endometrium in a regular 28 day cycle except:*

- a. Subnuclear vacuolation is the evidence of high LH activity
- b. On the 21st day, the glands become tortuous with visible secretion in the lumen
- c. On the 22nd day, stromal edema is maximum
- d. Leukocytic infiltration is maximum at about 2 days before menstruation

Q.108 *Lymphatics of the cervix drain primarily into the following glands except:*

- a. Internal iliac
- b. Inguinal
- c. Obturator
- d. External iliac

Q.109 *The followings are the late sequelae of acute PID except:*

- a. Increased infertility rate
- b. Chronic pelvic pain and ill health
- c. Recurrent fetal wastage
- d. Increased rate of ectopic pregnancy

Q.110 *Regarding polyps*

- a. Cervical polyps may be associated with endometrial polyps
- b. Endometrial polyps are generally multiple
- c. Malignant change of a polyp is frequent
- d. Polyps are always symptomatic

ANSWERS

Ans 106. (d). The pudendal nerve supplies the lower part but the upper part is supplied by the autonomic fibers from the hypogastric and pelvic plexuses.

Ans 107. (a). Subnuclear vacuolation is due to progesterone and appears on D 18, 36–48 hours after ovulation (see Dutta Gyne 6/e, p 91).

Ans 108. (b). Lymphatics from the cervix do not directly drain into the inguinal group of glands (see Dutta Gyne 6/e, p 29, Fig. 2.2).

Ans 109. (c). See Dutta Gyne 6/e, p 135.

Ans 110. (a, b). Q.(c). It is rare, Q.(d). usually asymptomatic.

QUESTIONS

Q.111 *Indications of rectal examination in gynecology are:*

- a. Genital prolapse
- b. Carcinoma cervix
- c. Cases with atresia vagina
- d. All of the above

Q.112 *Complications of MTP in the first trimester are all except:*

- a. Endometriosis
- b. Asherman's syndrome
- c. Cornual block
- d. Preterm labor in subsequent pregnancy

Q.113 *The following conditions are associated with these names — match them appropriately.*

- | | |
|------------------|---|
| a. Meigs | 1. Intermenstrual pain |
| b. Mittelschmerz | 2. Pararectal deep perineal incision |
| c. Schuchardt | 3. Cysts attached to the abdominal ostium of the fallopian tube |
| d. Kobelt | 4. Ascites, hydrothorax and ovarian fibroma |

Q.114 *Retroversion causes are:*

- a. Backache
- b. Dystocia
- c. Dyspareunia
- d. Anovulation

Q.115 *Side effects of chemotherapy include all except:*

- | | |
|----------------|---------------------|
| a. Nausea | b. Alopecia |
| c. Lymphoedema | d. Myelosuppression |

ANSWERS

Ans 111. (d). In genital prolapse it is done to differentiate rectocele from enterocele.

Ans 112. (a). Endometriosis is observed with hysterotomy not with menstrual regulation or dilatation and evacuation.

Ans 113. a = 4; b = 1; c = 2; d = 3.

Ans 114. (a,c). See Dutta Gyne 6/e, p 199.

Ans 115. (c). It is observed following pelvic lymphadenectomy.

QUESTIONS

Q.116 *Match the side effects according to the drug*

- | | |
|---------------------|--------------------------|
| a. Bleomycin | 1. Bone demineralization |
| b. Cyclophosphamide | 2. Hematuria |
| c. Paclitaxel | 3. Pulmonary fibrosis |
| d. Heparin | 4. Arrhythmias |

Q.117 *Raised serum levels of FSH are found in:*

- a. Oral contraceptive pill use.
- b. Postmenopausal women
- c. With the use of GnRH analogues
- d. Turner syndrome

University Questions

Q.118 *The ureter*

- a. Lies superior in the lateral vaginal fornix
- b. Has a squamous epithelial lining
- c. Passes behind the external iliac vessels
- d. Is crossed by the genitofemoral nerve

Q.119 *Regarding the arterial supply of the pelvis all are correct except:*

- a. The posterior trunk of internal iliac supplies the gluteal muscles
- b. Medial sacral artery arises from aorta
- c. The inferior vesical artery arises from the posterior trunk of internal iliac
- d. The inferior rectal artery arises from the internal pudendal artery

Q.120 *All are true regarding endometrium except:*

- a. It is lined by a single layer of columnar epithelium
- b. Is supplied by spiral arteries
- c. Becomes the decidua during pregnancy
- d. Its growth continues till the onset of menstruation

ANSWERS

Ans 116. a = 3; b = 2; c = 4; d = 1. See Dutta Gyne 6/e, p 516-517.

Ans 117. (b and d).

Ans 118. (a).

Ans 119. (c). See Dutta Gyne 6/e, p 26-27.

Ans 120. (d). See Dutta Gyne 6/e, p 8.

QUESTIONS

Q.121 *The mullerian duct:*

- a. Develops medial to the wolffian duct
- b. Is also known as the mesonephric duct
- c. Starts to form at 6 weeks of embryonic life
- d. Opens into the urogenital sinus separately

Q.122 *All are true regarding ovulation except:*

- a. Released oocyte still surrounded by granulosa cells
- b. May be blocked by prostaglandin inhibitors
- c. Occurs 36 hours after LH peak
- d. Occurs 32 hours after injection of hCG

Q.123 *All are true about acquired immunodeficiency syndrome (AIDS) except:*

- a. The infection is due to a DNA virus
- b. The virus binds to the CD4 molecule on T cells
- c. Transmission can be by artificial insemination
- d. Mother to child transmission is about 30%.

Q.124 *All the following statements about infection are true except:*

- a. HPV has been detected in 90% of carcinoma of cervix
- b. Chlamydia are unable to grow in cell-free media
- c. Chlamydia are responsible for lymphogranuloma venereum
- d. Chlamydial salpingitis is always confined to the pelvis

Q.125 *Which one of the followings is true about sex steroids?*

- a. Progestogen only contraceptive pills inhibit ovulation
- b. Large doses of progestational agents can inhibit ovulation
- c. Progesterone in oral pill suppresses FSH
- d. Estrogen impairs glucose tolerance

ANSWERS

Ans 121. (c). See Dutta Gyne 6/e, p 35.

Ans 122. (c). See Dutta Gyne 6/e, p 92-93.

Ans 123. (a).

Ans 124. (d).

Ans 125. (b).

QUESTIONS

Q.126 *For cytohormonal study the most informative index is:*

- a. Eosinophilic
- b. Karyopyknotic
- c. Cornification
- d. Maturation

Q.127 *Withdrawal bleeding following administration of progestogen in a case of secondary amenorrhea indicates all except:*

- a. Absence of pregnancy
- b. Production of endogenous estrogen
- c. Endometrium is responsive to estrogen
- d. Defect in pituitary-gonadal axis

Q.128 *The following condition is aggravated by the use of combined oral contraceptives*

- a. Hirsutism
- b. Endometriosis
- c. Premenstrual tension
- d. Cervical ectopy

Q.129 *Regarding hydatidiform mole—all are correct except:*

- a. Best diagnosed by ultrasonography
- b. May present with small for date uterus
- c. Chromosomes are derived entirely from mother
- d. β hCG levels $>100,000$ IU/l is a risk factor for malignancy

Q.130 *In a normal human female, the number of oocytes is greatest at:*

- a. Intrauterine life
- b. Birth
- c. Puberty
- d. Peak reproductive period

ANSWERS

Ans 126. (d).

Ans 127. (d). See Dutta Gyne 6/e, p 469.

Ans 128. (d).

Ans 129. (c). See Dutta Obs check new edition.

Ans 130. (a).

QUESTIONS

Q.131 *The zygote enters the uterine cavity in:*

- a. 4 cell stage
- b. 6–16 cell stage
- c. 32–64 cell stage
- d. None of the above

Q.132 *Serum FSH level in postmenopausal women is:*

- a. 0.5–2 IU/l
- b. 5–10 IU/l
- c. 15–20 IU/l
- d. Above 40 IU/l

Q.133 *Danazol is:*

- a. Estrogen derivative
- b. Progestogen derivative
- c. Combined estrogen and progesterone
- d. Androgen derivative

Q.134 *Commonest benign tumor of ovary is:*

- a. Dermoid cyst
- b. Serous cystadenoma
- c. Mucinous cystadenoma
- d. Endometrioma

Q.135 *Commonest secondary change found in uterine fibromyoma is:*

- a. Fatty degeneration
- b. Red degeneration
- c. Hyaline degeneration
- d. Sarcomatous change

ANSWERS

Ans 131. (b).

Ans 132. (d).

Ans 133. (d).

Ans 134. (b).

Ans 135. (c).

QUESTIONS

Q.136 *Factors considered in the epidemiology of cervical cancer include exposure to:*

- a. Herpes simplex virus
- b. Human papilloma virus
- c. Both of above
- d. None of above

Q.137 *Commonest cause of male infertility among the following is:*

- a. Defective spermatogenesis
- b. Genital tract infection
- c. Genital tract obstruction
- d. Sperm autoimmunity

Q.138 *Material used to distend the uterine cavity during hysteroscopy is:*

- a. Dextran solution
- b. Saline solution
- c. Carbon dioxide gas
- d. All of the above

Q.139 *Recurrent cervical cancer may be better detected early by the following:*

- a. Bimanual vaginal examination
- b. Ultrasound examination
- c. CT scan
- d. MRI

Q.140 *Commonest cause of oligomenorrhea in adolescent female is:*

- a. Hypothyroidism
- b. Polycystic ovarian disease
- c. Hyperprolactinemia
- d. Tuberculous endometritis

ANSWERS

Ans 136. (c).

Ans 137. (a).

Ans 138. (d).

Ans 139. (d).

Ans 140. (b).

QUESTIONS

Q.141 *The most common cause of pruritus vulvae among the following is:*

- a. Thread-worm infestation
- b. Infective vaginal discharge
- c. Diabetes mellitus
- d. Application of strong antiseptics for vulval hygiene

Q.142 *Commonest complication following first trimester MTP is:*

- a. Significant hemorrhage
- b. Sepsis
- c. Incomplete abortion
- d. Uterine perforation

Q.143 *A 4th gravida, having 3 living children requests MTP at 18 weeks of pregnancy on grounds of too many children and condom failure. Your opinion will be:*

- a. MTP with intra-amniotic hypertonic saline
- b. MTP with ethacridine lactate
- c. Hysterotomy with tubal sterilization
- d. MTP will not be done

Q.144 *Safe, effective and acceptable contraception in women over 40 years is:*

- a. Barrier contraception
- b. Combined estrogen-progestogen pill
- c. Progestin only pill
- d. Intrauterine device

Q.145 *Prolonged use of combined estrogen-progestin contraceptive pill is likely to reduce the incidence of:*

- | | |
|----------------------|----------------------|
| a. Ovarian cancer | b. Cervical cancer |
| c. Both of the above | d. None of the above |

ANSWERS

Ans 141. (b).

Ans 142. (c).

Ans 143. (b).

Ans 144. (c). See Dutta Gyne 6/e, p 501.

Ans 145. (a). See Dutta Gyne 6/e, p 489.

QUESTIONS

Q.146 *Complications of vasectomy for male sterilization include the following except:*

- a. Scrotal hematoma
- b. Infection
- c. Antisperm antibody formation
- d. Decreased libido

Q.147 *During anterior colporrhaphy, the lower limit of base of urinary bladder is best identified by*

- a. Most prominent bulge at vaginal introitus
- b. Transverse vaginal sulcus
- c. Lower limit of bulge in front of cervix
- d. Passing a metal catheter in urinary bladder

Q.148 *Appropriate surgical treatment of Procidentia in a woman aged 40 years is:*

- a. Fothergill's operation
- b. Ward-Mayo's operation
- c. LeFort's operation
- d. Cervicopexy

Q.149 *Population of India according to 2011 census is:*

- a. 1210.01 million
- b. 1107.93 million
- c. 1012.37 million
- d. 1027.01 million

ANSWERS

Ans 146. (d). See Dutta Gyne 6/e, p 495.

Ans 147. (d).

Ans 148. (b).

Ans 149. (a).

According to census 2011, (February 28 and March 1), India's population is 1,210,193,422. This equal to the total population of another six countries (US + Indonesia + Brazil + Pakistan + Bangladesh + Japan).

Literacy rate has improved from 65% (2001) to 74% (2011). For the male improvement rate is from 75% (2001) to 82% (2011) and for the female it has improved from 54% (2001) to 65% (2011). Growth rate has declined to 14.7% (2011) from 21.54% (2001). The serious negative observation in the census was the decline in child (upto 6 years of age) sex ratio—only 914 girls to 1000 boys.

QUESTIONS

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Q.150 *Primordial follicle has:*

- a. Single layer of granulosa cells
- b. Single layer of theca cells
- c. Layers of both granulosa and theca cells
- d. Its rapid growth leads to antrum formation

Q.151 *The organ which has complete origin from mullerian ducts is:*

- a. Uterus
- b. Vagina
- c. Both of the above
- d. None of the above

Q.152 *Androgen production in testis occurs in:*

- a. Leydig's cells
- b. Sertoli cells
- c. Tunica albuginea
- d. Rete testis

Q.153 *Luteal phase defect is suggested by a midluteal progesterone peak of:*

- a. Less than 9 ng/ml
- b. 10 ng/ml – 15 ng/ml
- c. 16 ng/ml – 20 ng/ml
- d. Greater than 20 ng/ml

Q.154 *Commonest cause of vesicovaginal fistula in our country is:*

- a. Prolonged use of pessary for uterine prolapse
- b. Obstructed labor
- c. Advanced malignancy of vagina
- d. Radium insertion in treatment of cancer cervix

ANSWERS

Ans 150. (a).

Ans 151. (a).

Ans 152. (a).

Ans 153. (a).

Ans 154. (b). See Dutta Gyne 6/e, p 418.

QUESTIONS

Q.155 *A 30-years-old multipara complains of white discharge per vagina for 2 years. The most likely cause is:*

- a. Acute vaginitis
- b. Chronic cervicitis
- c. Genital prolapse
- d. Irritant vaginal douche

Q.156 *Of the following ovarian tumors, germ cell tumor of the ovary is:*

- a. Dysgerminoma
- b. Brenner's tumor
- c. Theca-cell tumor
- d. Clear cell carcinoma

Q.157 *Female infertility is mostly due to:*

- a. Anovulation
- b. Tubal block
- c. Luteal phase defect
- d. Tuberculous endometritis

Q.158 *In FIGO staging of ovarian cancer, stage IIa implies:*

- a. Growth limited to one ovary with ascites containing malignant cells
- b. Growth limited to both the ovaries with ascites containing malignant cells
- c. Extension to pelvic peritoneum
- d. Extension and/or metastases to uterus or uterine tubes

Q.159 *Secondary dysmenorrhea is common in the following conditions except:*

- a. Pelvic inflammatory disease
- b. Endometriosis
- c. Dysfunctional uterine bleeding
- d. Presence of intrauterine device

ANSWERS

Ans 155. (b). See Dutta Gyne 6/e, p 552.

Ans 156. (a).

Ans 157. (a).

Ans 158. (d).

Ans 159. (c).

QUESTIONS

Q.160 *Side-effects of clomiphene citrate in ovulation induction includes the following except:*

- a. Ovarian hyperstimulation
- b. Excessive menstrual loss
- c. Breast tenderness
- d. Hot flushes

Q.161 *Role of diagnostic hysteroscopy includes the followings except:*

- a. Diagnosis of intrauterine adhesions
- b. Looking for lost IUCD
- c. Diagnosis of closed tubal abdominal ostia
- d. Diagnosis of submuosous polyps

Q.162 *Commonest of the following complications of laparoscopy is:*

- a. Periumbilical hematoma formation
- b. Surgical emphysema
- c. Bowel injury
- d. Injury to great vessels

Q.163 *Contraindications to use of combined oral contraceptive includes the followings except:*

- a. Active liver disease
- b. Thromboembolic disorders
- c. Hyperlipidemia
- d. Nulliparity

Q.164 *Contraindications to intrauterine contraceptive device insertion includes the followings except:*

- a. Genital tract infection
- b. Abnormal uterine bleeding
- c. Suspected pregnancy
- d. Lactating mothers

ANSWERS

Ans 160. (b). See Dutta Gyne 6/e, p 244, 533.

Ans 161. (c). See Dutta Gyne 6/e, p 621.

Ans 162. (b).

Ans 163. (d). See Dutta Gyne 6/e, p 487.

Ans 164. (d). See Dutta Gyne 6/e, p 480

QUESTIONS

Q.165 *Part of the fallopian tube which is ideally excised in tubal sterilization is*

- a. A loop of isthmus
- b. A loop of ampullary part
- c. Isthmoampullary junctional zone
- d. Infundibulum

Q.166 *Relatively safe and effective method of medical termination of pregnancy in 2nd trimester (16–20 weeks) is:*

- a. Intra-amniotic hypertonic saline
- b. Extra-amniotic ethacridine lactate
- c. Extra-amniotic prostaglandin
- d. Hysterotomy

Q.167 *Among the followings, Pearl index is highest with:*

- a. Combined oral contraceptive
- b. Intrauterine contraceptive device
- c. Barrier contraception
- d. Calendar rhythm method

Q.168 *During routine laparotomy for gynecological surgery, the following structures are most liable to injury except:*

- a. Intestines
- b. Omentum
- c. Urinary bladder
- d. Inferior epigastric vessels

Q.169 *On the basis of census 2011, arrange the following states according to population (from higher to lower):*

- a. Bihar
- b. Bengal
- c. Orissa
- d. Uttar Pradesh

ANSWERS

Ans 165. (a). See Dutta Gyne 6/e, p 496.

Ans 166. (b).

Ans 167. (d).

Ans 168. (d).

Ans 169. d. Uttar Pradesh = 19.96 crore

- a. Bihar = 10.38 crore
- b. Bengal = 9.13 crore
- c. Orissa = 4.19 crore

QUESTIONS

Q.170 *Vagina develops from:*

- a. Mullerian duct only
- b. Sinovaginal bulb only
- c. Both mullerian duct and sinovaginal bulb
- d. Gartner's duct

Q.171 *Mean blood loss during usual menstrual flow is:*

- a. 15 ml
- b. 35 ml
- c. 90 ml
- d. 150 ml

Q.172 *Ovulation occurs as a result of:*

- a. Increased intrafollicular tension
- b. Critical hemodynamic response
- c. Midcycle LH surge
- d. Low estrogen level

Q.173 *Which one is not a branch of internal iliac artery*

- a. Superior vesical artery
- b. Middle rectal artery
- c. Median sacral artery
- d. Obturator artery

Q.174 *The following statements in connections with carcinoma of cervix are true except:*

- a. Human papilloma virus (HPV) may be causative agent
- b. Basement membrane is always invaded in all cases
- c. Common histopathological report is squamous cell carcinoma
- d. Usually spreads by lymphatics

ANSWERS

Ans 170. (c).

Ans 171. (b). See Dutta Gyne 6/e, p 82.

Ans 172. (c).

Ans 173. (c). See Dutta Gyne 6/e, p 27

Ans 174. (b).

QUESTIONS

Q.175 *Ovulation can be detected by the following methods except:*

- a. Biphasic variation of basal body temperature
- b. Presence of secretory endometrium
- c. Absence of intermediate cells in vaginal smear collected on 22nd day of cycle
- d. Disappearance of fern pattern in the cervical mucus examined on 22nd day of cycle.

Q.176 *Schroeder's disease is the other name of:*

- a. Metropathia hemorrhagica
- b. Puberty menorrhagia
- c. Irregular ripening and irregular shedding of endometrium
- d. Cryptomenorrhea

Q.177 *Vaginal pH is maintained by which organisms?*

- a. Anaerobic streptococci
- b. Doderlein's bacillus
- c. *E. coli*
- d. Diphtheroids

Q.178 *Tubal patency is judged by all of the followings except:*

- a. Insufflation of tubes
- b. Hysterosalpingography
- c. Laparoscopic dye test
- d. X-ray of the pelvis

Q.179 *The following findings will be present in Turner's syndrome, except:*

- a. Short stature
- b. Absence of sex chromatin body
- c. Cubitus vulgus
- d. Normal ovaries

ANSWERS

Ans 175. (c).

Ans 176. (a). See Dutta Gyne 6/e, p 188.

Ans 177. (b).

Ans 178. (d).

Ans 179. (d). See Dutta Gyne 6/e, p 441-442.

QUESTIONS

Q.180 *Which variety of ovarian cyst is more likely to undergo torsion?*

- a. Dermoid cyst
- b. Serous cystadenoma
- c. Mucinous cystadenoma
- d. Serous cystadenocarcinoma

Q.181 *Psammoma body is characteristically found in:*

- a. Serous cystadenoma of ovary
- b. Mucinous cystadenoma of ovary
- c. Follicular cyst of ovary
- d. Luteal cyst of ovary

Q.182 *Which one is solid and malignant ovarian tumor*

- a. Brenner's tumors
- b. Thecoma
- c. Mesonephroma
- d. Fibroma

Q.183 *Pseudomyxoma peritonei is found in the following conditions except:*

- a. Pseudomucinous cystadenoma
- b. Mucocele of appendix
- c. Colloid carcinoma of intestine
- d. Schirrous carcinoma of breasts

Q.184 *As per WHO standard, oligospermia means:*

- a. Sperm count less than 10 million per cc
- b. Sperm count less than 20 million per cc
- c. Sperm count less than 40 million per cc
- d. Sperm count less than 60 million per cc

ANSWERS

Ans 180. (a).

Ans 181. (a).

Ans 182. (c).

Ans 183. (d).

Ans 184. (b). See Dutta Gyne 6/e, p 232.

QUESTIONS

Q.185 *In which condition, the external os of cervix must not lie outside the introitus?*

- a. First degree vaginouterine prolapse
- b. Second degree vaginouterine prolapse
- c. Third degree vaginouterine prolapse
- d. Congenital hypertrophied elongation of cervix

Q.186 *Which one is not the component of Fothergill's operation?*

- a. Amputation of cervix
- b. Anterior colporrhaphy
- c. Tightening the Mackenrodt's ligament in front of the cervix
- d. Shortening the uterosacral ligaments

Q.187 *"Emergency contraception" includes the use of following except:*

- a. Estrogen and progestogen pills
- b. Progestogen only
- c. IUCD only
- d. Coitus interruptus

Q.188 *Medical abortion is ideally undertaken with:*

- a. Mifepristone only
- b. Prostaglandin only
- c. Mifepristone and prostaglandin together
- d. Estrogen and progestogen together

Q.189 *Which IUCD needs to be replaced after 10 year:*

- a. CuT - 380
- b. LNG containing IUCD
- c. CuT - 200
- d. Multiload - 375

ANSWERS

Ans 185. (a).

Ans 186. (d). See Dutta Gyne 6/e, p 216.

Ans 187. (d).

Ans 188. (c).

Ans 189. (a). See Dutta Gyne 6/e, p 480.

QUESTIONS

Q.190 *Induction of ovulation is done by the following agents except:*

- a. Clomiphene citrate
- b. Gonadotropin injection
- c. Clomiphene with gonadotropin injection
- d. Danazol

Q.191 *The following arteries in the pelvis are the branches of internal iliac artery except:*

- a. Middle rectal artery
- b. Superior rectal
- c. Internal pudendal artery
- d. Uterine artery

Q.192 *Which one is not a Bioactive IUCD?*

- a. Copper T - 200
- b. Levonorgestrel containing IUCD
- c. Nuvaring
- d. Lippes loop

Q.193 *Which one of the following microbial agents causes carcinoma of cervix?*

- a. Trichomonas vaginalis
- b. *Candida albicans*
- c. Human papilloma virus
- d. Human immunodeficiency virus

Q.194 *The components of Meigs' syndrome are:*

- a. Fibroma of ovary
- b. Ascites
- c. Hydrothorax
- d. All of the above

ANSWERS

Ans 190. (d).

Ans 191. (b).

Ans 192. (d).

Ans 193. (c).

Ans 194. (d).

QUESTIONS

Q.195 *Strawberry vagina is seen in infection with:*

- a. Trichomonas vaginalis
- b. Bacterial vaginosis
- c. *Candida albicans*
- d. Herpes simplex

Q.196 *The most common symptom of cervicitis is:*

- a. Dysmenorrhea
- b. Bleeding per vagina
- c. Leukorrhea
- d. Infertility

Q.197 *Which is not a feature of dysfunctional uterine bleeding:*

- a. Tender uterus
- b. Menorrhagia
- c. Uterine size of 8–10 weeks
- d. Proliferative endometrium

Q.198 *In a patient with 3rd degree perineal tear, presenting after one week of delivery, repair should be done:*

- a. Immediately
- b. After two weeks
- c. After 12 weeks
- d. After 6 months

Q.199 *Attacks of flushing and cyanosis occur in which type of ovarian tumor?*

- a. Struma ovary
- b. Krukenberg tumor
- c. Carcinoid tumor of ovary
- d. Granulosa cell tumor

ANSWERS

Ans 195. (a).

Ans 196. (c).

Ans 197. (a).

Ans 198. (c).

Ans 199. (c).

QUESTIONS

Q.200 *Narrowest part of fallopian tube is the:*

- a. Interstitial portion
- b. Isthmus
- c. Infundibulum
- d. Ampulla

Q.201 *Metrorrhagia is caused by all except:*

- a. Submucous myoma
- b. Subserous fibroid uterus
- c. Intrauterine contraceptive device
- d. Adenomyosis

Q.202 *Commonest degeneration in fibroid uterus is:*

- a. Red degeneration
- b. Hyaline degeneration
- c. Calcareous degeneration
- d. Cystic degeneration

Q.203 *The following agents are commonly used in HRT except:*

- a. Estrogen
- b. Estrogen and progestogen
- c. Phyto estrogen
- d. Testosterone

Q.204 *Ovulation coincides with:*

- a. Estrogen surge
- b. Progesterone surge
- c. LH surge
- d. FSH surge

ANSWERS

Ans 200. (a).

Ans 201. (b).

Ans 202. (b).

Ans 203. (d).

Ans 204. (c).

QUESTIONS

Q.205 *Fecal incontinence is caused by the following except:*

- a. Recto-vaginal fistula
- b. Complete perineal tear
- c. Asthenia
- d. Enterocele

Q.206 *Ectopic pregnancy is associated with all except:*

- a. Salpingitis
- b. IUCD
- c. Plastic operations on the tube
- d. Clomiphene citrate therapy

Q.207 *Characteristics of Turner's syndrome are:*

- a. Short stature
- b. Webbed neck
- c. Widely spaced nipple
- d. All of the above

Q.208 *Intermediate cell predominance on vaginal cytology is seen in:*

- a. Pregnancy
- b. Menstruation
- c. Postovulatory
- d. Premenstrual

Q.209 *Which is not true for functional ovarian cyst?*

- a. Most common functional cyst is follicular cyst
- b. Usually not larger than 8 cms
- c. All are benign
- d. Usually requires surgery

ANSWERS

Ans 205. (d).

Ans 206. (d).

Ans 207. (d). See Dutta Gyne 6/e, p 441-422

Ans 208. (a) and (c).

Ans 209. (d).

QUESTIONS

Q.210 *In mucinous ovarian tumor, all are true except:*

- a. Arises from surface epithelium of ovary
- b. Contain thick viscid mucin
- c. Tumor may grow to a large size
- d. Presence of psammoma bodies

Q.211 *Gonadectomy is indicated in:*

- a. Klinefelter's syndrome
- b. Androgen insensitivity syndrome
- c. Turner's syndrome
- d. Isosexual sexual precocity

Q.212 *Causes of postmenopausal bleeding per vagina are all except:*

- a. Endometrial carcinoma
- b. Decubitus ulcer
- c. Endometriosis
- d. Atrophic endometritis

Q.213 *In which day of cycle endometrial biopsy is best taken for detection of ovulation:*

- a. 5th–7th day
- b. 10th–14th day
- c. 9th–11th day
- d. 21st–24th day

Q.214 *Monilial vaginitis is commonly associated with all except:*

- a. Prolonged antibiotic therapy
- b. Diabetes mellitus
- c. Treatment of malaria with chloroquine
- d. Pregnancy

ANSWERS

Ans 210. (d).

Ans 211. (b).

Ans 212. (c).

Ans 213. (d).

Ans 214. (c).

QUESTIONS

Q.215 *Virilizing tumors of the ovary are all except:*

- a. Sertoli Leydig cell tumor
- b. Arrhenoblastoma
- c. Adrenal like tumors of ovary
- d. Granulosa cell tumor

Q.216 *Treatment of Asherman's syndrome is:*

- a. Dilatation and curettage
- b. Hysterotomy
- c. Adhesiolysis and IUCD
- d. Hysterectomy

Q.217 *Menstruation is defined as precocious, if it starts before the age of:*

- a. 8 years
- b. 10 years
- c. 14 years
- d. 12 years

Q.218 *VVF in India is commonly due to:*

- a. Carcinoma cervix
- b. Prolonged labor
- c. Gynecological surgery
- d. Carcinoma vagina

Q.219 *The method of sterilization least suited for recanalization is:*

- a. Pomeroy's method
- b. Fallope rings
- c. Clips
- d. Bipolar cauterization

ANSWERS

Ans 215. (d).

Ans 216. (c).

Ans 217. (a).

Ans 218. (b).

Ans 219. (a).

QUESTIONS

Q.220 *Most common site for genital tuberculosis is:*

- a. Ovary
- b. Uterus
- c. Cervix
- d. Fallopian tube

Q.221 *Uterus is absent in primary amenorrhea of patients with:*

- a. Turner's syndrome
- b. Testicular feminisation syndrome
- c. Imperforate hymen
- d. Premature ovarian failure

Q.222 *Greenish yellow discharge per vaginam with strawberry vagina is suggestive of infection with:*

- a. Trichomonas vaginalis
- b. Gonococcal infection
- c. Atrophic vaginitis
- d. Monilial

Q.223 *Call-Exner bodies are formed in:*

- a. Arrhenoblastoma
- b. Granulosa-theca cell tumor
- c. Brenner's tumor
- d. Endodermal sinus tumor

Q.224 *All are true for Clomiphene citrate except:*

- a. It is an ovulation-inducing drug
- b. It is an antiestrogen
- c. It can cause multiple pregnancy
- d. It is not used in PCOS

ANSWERS

Ans 220. (d).

Ans 221. (b).

Ans 222. (a).

Ans 223. (b).

Ans 224. (d).

QUESTIONS

Q.225 *Commonest cause of hirsutism in a teenage girl is:*

- a. Obesity
- b. Cushing disease
- c. Polycystic disease
- d. Addison's disease

Q.226 *All of the following drugs are used in endometriosis except:*

- a. Danazol
- b. Medroxy-progesterone acetate
- c. Norethisterone
- d. Tibolone

Q.227 *Which is not an assisted reproduction technique?*

- a. GIFT
- b. ZIFT
- c. IVF and ET
- d. IUI

Q.228 *Length of the fallopian tube is:*

- a. 10 cm
- b. 7 cm
- c. 5 cm
- d. 3 cm

Q.229 *Left ovarian vein drains into:*

- a. Inferior vena cava
- b. Left common iliac vein
- c. Left renal vein
- d. Left hypogastric vein

ANSWERS

Ans 225. (c).

Ans 226. (d).

Ans 227. (d).

Ans 228. (a).

Ans 229. (c).

QUESTIONS

Q.230 *Followings are contraindications of IUCD except:*

- a. Irregular vaginal bleeding
- b. Pelvic inflammatory disease
- c. Following MTP
- d. Uterine didelphys

Q.231 *Turner's syndrome includes all except:*

- a. Short stature
- b. Webbing of neck
- c. No secondary sex characters
- d. Karyotype 46XY

Q.232 *Spinbarkeitt is mostly demonstrated in which phase of menstrual cycle?*

- a. Proliferative
- b. Secretory
- c. Just before menstruation
- d. Menstrual

Q.233 *Which part of fallopian tube is excised in Pomeroy's method of female sterilization?*

- a. Isthmus
- b. Ampulla
- c. Fimbrial end
- d. Interstitial part

Q.234 *Bartholin's ducts open into:*

- a. Labia majora
- b. Labia minora
- c. Lower vagina
- d. Groove between minora and hymen

ANSWERS

Ans 230. (c).

Ans 231. (d).

Ans 232. (a). See Dutta Gyne 6/e, p 115.

Ans 233. (a). See Dutta Gyne 6/e, p 496.

Ans 234. (d).

QUESTIONS

Q.235 *Commonest cause of oligomenorrhea in an adolescent female is:*

- a. Hypothyroidism
- b. PCOS
- c. Hyperprolactinemia
- d. Tuberculous endometritis

Q.236 *Psammoma body is characteristically found in:*

- a. Serous cystadenoma of ovary
- b. Mucinous cystadenoma of ovary
- c. Follicular cyst of ovary
- d. Luteal cyst of ovary

Q.237 *Which one is not the component of Fothergill's operation?*

- a. Amputation of cervix
- b. Anterior colporrhaphy
- c. Tightening of cardinal ligaments in front of cervix
- d. Plication of the round ligaments anteriorly

Q.238 *Commonest site of endometriosis is:*

- a. Vagina
- b. Urinary bladder
- c. Ovary
- d. Peritoneal cavity

Q.239 *Call-Exner bodies are seen in:*

- a. Granulosa cell tumor
- b. Mucinous cystadenoma
- c. Papillary cystadenoma
- d. Dermoid cyst

ANSWERS

Ans 235. (b).

Ans 236. (a). See Dutta Gyne 6/e, p 293.

Ans 237. (d).

Ans 238. (c). See Dutta Gyne 6/e, p 305.

Ans 239. (a). See Dutta Gyne 6/e, p 384.

QUESTIONS

Q.240 *Fungal vulvitis is associated with:*

- a. Tuberculosis
- b. Lymphoma
- c. Diabetes
- d. Severe pre eclampsia

Q.241 *Commonest malignancy of the body of uterus is:*

- a. Adenoacanthoma
- b. Squamous cell carcinoma
- c. Sarcoma
- d. Adenocarcinoma

Q.242 *Treatment of choice in a young patient with primary dysmenorrhea is:*

- a. Presacral neurectomy
- b. Dilatation of cervix
- c. Hysterectomy
- d. Symptomatic

Q.243 *The components of Meigs' syndrome are:*

- a. Fibroma of ovary
- b. Ascites
- c. Hydrothorax
- d. All of the above

ANSWERS

Ans 240. (c).

Ans 241. (d). See Dutta Gyne 6/e, p 355.

Ans 242. (d). See Dutta Gyne 6/e, p 179.

Ans 243. (d). See Dutta Gyne 6/e, p 296.

QUESTIONS

Q.244 *Side effect of Depo-provera are all except:*

- a. Weight gain
- b. Irregular bleeding
- c. Amenorrhea
- d. Hepatitis

Q.245 *Regarding hCG, the followings are true except:*

- a. Secreted by cytotrophoblasts
- b. Acts on same receptor as LH
- c. Has luteotrophic action
- d. It is a glycoprotein

Q.246 *“Peg cells” are seen in:*

- a. Vagina
- b. Vulva
- c. Ovary
- d. Fallopian tubes

Q.247 *Marker of choriocarcinoma is:*

- a. Estrogen
- b. Progesterone
- c. Alpha fetoprotein
- d. hCG

ANSWERS

Ans 244. (d).

Ans 245. (a).

Ans 246. (d).

Ans 247. (d).

QUESTIONS

OTHER INDIAN UNIVERSITIES

Q.248 *Commonest method for 1st trimester MTP is:*

- a. Prostaglandin alone
- b. Medical method of mifepristone and misoprostol
- c. Suction evacuation
- d. D and E

Q.249 *Commonest degeneration during pregnancy in fibroid uterus is:*

- a. Hyaline degeneration
- b. Calcareous degeneration
- c. Red degeneration
- d. Fatty degeneration

Q.250 *Most common cause of death in ectopic pregnancy is:*

- a. Infection
- b. Bowel obstruction
- c. Hemorrhage
- d. Pulmonary embolism

Q.251 *Danazol is used in treatment of:*

- a. Cancer cervix
- b. Vulval cancer
- c. Endometrial cancer
- d. Endometriosis

Q.252 *Regarding female urethra, all are correct, except:*

- a. It measures 4 cm in length
- b. It is related to the anterior vaginal wall
- c. Mucous membrane is lined by columnar epithelium
- d. It opens below the clitoris

ANSWERS

Ans 248. (b).

Ans 249. (c). See Dutta Gyne 6/e, p 275.

Ans 250. (c).

Ans 251. (d). See Dutta Gyne 6/e, p 530, Table 31.3.

Ans 252. (c). See Dutta Gyne 6/e, p 13.

QUESTIONS

Q.253 *Regarding vagina, all are correct, except:*

- a. The length of the anterior wall is 7 cm
- b. It is lined by stratified squamous epithelium
- c. Vaginal pH is 4–5 in the reproductive period
- d. It is developed entirely from the mullerian ducts

Q.254 *About normal menstrual cycles all are correct, except:*

- a. Regression of corpus luteum starts on day 28
- b. Ovulation is due to LH surge
- c. Secretory change of endometrium is due to prostaglandins
- d. Menstrual bleeding is due to fall in the level of FSH and LH

Q.255 *Regarding cervical carcinoma, all are correct, except:*

- a. It is common in India
- b. Commonly it is a squamous cell carcinoma
- c. Total hysterectomy is the treatment
- d. Cytology screening can prevent it

Q.256 *Ovulation can be detected by all, except:*

- a. Basal body temperature change
- b. Cervical mucous study
- c. Cervical cytology
- d. Serum progesterone

Q.257 *All are the causes of menorrhagia except:*

- a. Fibroid uterus
- b. IUCD
- c. Cervical polyp
- d. Adenomyosis

ANSWERS

Ans 253. (d). See Dutta Gyne 6/e, p 4.

Ans 254. (b).

Ans 255. (c).

Ans 256. (c). See Dutta Gyne 6/e, p 235.

Ans 257. (c). See Dutta Gyne 6/e, p 185.

QUESTIONS

Q.258 *Medical management of fibroid includes all, except:*

- a. Danazol
- b. Progestogens
- c. Prostaglandin synthetase inhibitors
- d. GnRH

Q.259 *Regarding endometriosis:*

- a. It causes primary dysmenorrhea
- b. Ovary is the common site
- c. Surgery is the treatment of choice
- d. Malignant change is common

Q.260 *All are the high-risk factors for endometrial carcinoma, except:*

- a. Obesity
- b. Multiparity
- c. Use of estrogen
- d. Diabetes

Q.261 *Secondary amenorrhea is due to all, except:*

- a. Polycystic ovarian disease
- b. Imperforate hymen
- c. Thyroid dysfunction
- d. Tuberculosis

Q.262 *Which gas is most commonly used in laparoscopy?*

- a. O₂
- b. CO₂
- c. N₂O
- d. N₂

ANSWERS

Ans 258. (d). See Dutta Gyne 6/e, p 280, Table 19.7.

Ans 259. (b).

Ans 260. (b). See Dutta Gyne 6/e, p 354-355.

Ans 261. (b). See Dutta Gyne 6/e, p 457, table 28.3

Ans 262. (b). See Dutta Gyne 6/e, p 615.

QUESTIONS

Q.263 *Perineal tear in obstetrics should be repaired:*

- a. 36 hours later
- b. 24 hours later
- c. 48 hours later
- d. Immediately

Q.264 *Smear for hormonal evaluation is taken from which part of vagina?*

- a. Anterior wall
- b. Lateral wall
- c. Posterior wall
- d. Fornices

Q.265 *Which investigation is not done in FIGO staging of carcinoma cervix?*

- a. IVP
- b. Cystoscopy
- c. Chest X-ray
- d. Pelvic ultrasound

Q.266 *Fothergill's repair operation has all the complications except:*

- a. First trimester abortion
- b. Cervical dystocia
- c. Premature labor
- d. Premature rupture of membrane

Q.267 *What is the appropriate time in the menstrual cycle to do endometrial biopsy as a part of investigation for infertility:*

- a. 3–5 days
- b. 12–14 days
- c. 17–19 days
- d. 20–22 days

ANSWERS

Ans 263. (d). See Dutta Gyne 6/e, p 432.

Ans 264. (b). See Dutta Gyne 6/e, p 113.

Ans 265. (d). See Dutta Gyne 6/e, p 341, Table 23.7.

Ans 266. (a). See Dutta Gyne 6/e, p 223, Table 15.5.

Ans 267. (d). See Dutta Gyne 6/e, p 240 Table 16.6.

QUESTIONS

Q.268 *Best method of contraception for a newly married lady with rheumatic heart disease is:*

- a. Condoms
- b. Oral pills
- c. Norplant
- d. IUCD

Q.269 *Menorrhagia is defined, if blood loss per vagina is more than:*

- a. 50 ml
- b. 80 ml
- c. 110 ml
- d. 150 ml

Q.270 *The following findings will be present in Turner's syndrome, except:*

- a. Short stature
- b. Absence of sex chromatin body
- c. Cubitus vulgus
- d. Normal ovaries

Q.271 *Which one is a solid and malignant ovarian tumor:*

- a. Brenner's tumor
- b. Thecoma
- c. Mesonephroma
- d. Fibroma

Q.272 *Laparotomy should be done in a case of ovarian cyst with pregnancy is:*

- a. Immediately on diagnosis
- b. Preferably in 2nd trimester
- c. Preferably in 3rd trimester
- d. Preferably after delivery

ANSWERS

Ans 268. (a). See Dutta Gyne p 500.

Ans 269. (b). See Dutta Gyne 6/e, p 185.

Ans 270. (d). See Dutta Gyne 6/e, p 441-422.

Ans 271. (c).

Ans 272. (b). See Dutta Obs 8/e, p 361.

QUESTIONS

Q.273 *Oral contraceptive pills cause all except:*

- a. Dysmenorrhea
- b. Weight gain
- c. Nausea
- d. Mastalgia

Q.274 *Psammoma bodies are seen in:*

- a. Papillary serous cyst adenoma
- b. Mucinous cyst adenocarcinoma
- c. Dysgerminoma
- d. Granulosa cell tumor

Q.275 *CIN grade II means*

- a. Carcinoma cervix stage II
- b. Carcinoma in situ
- c. Involvement upto basal 2/3 of the epithelium
- d. Any CIN persisting for more than 2 years

Q.276 *All of the following IUCDs are to be changed every 3–5 years except:*

- a. Cu T 200
- b. Cu T 380A
- c. Multiload devices
- d. Cu T 375

Q.277 *Ca-125 is used as a tumor marker for:*

- a. Carcinoma cervix
- b. Carcinoma endometrium
- c. Carcinoma ovary
- d. Carcinoma vulva

ANSWERS

Ans 273. (a). See Dutta Gyne 6/e, p 489.

Ans 274. (a). See Dutta Gyne 6/e, p 293.

Ans 275. (c). See Dutta Gyne 6/e, p 320.

Ans 276. (b). See Dutta Gyne 6/e, p 480.

Ans 277. (c). See Dutta Gyne 6/e, p 521, Table 30.9.

QUESTIONS

Q.278 *All of the followings are effective in treatment of endometriosis except*

- a. Estrogen
- b. Progesterone
- c. Danazol
- d. GnRH agonists

Q.279 *Reversibility of tubal ligation is maximum after:*

- a. Laparoscopic clip occlusion
- b. Pomeroy method
- c. Irving method
- d. Laparoscopic electrocautery

Q.280 *Bilateral ovarian carcinoma, ascites with positive malignant cells. The FIGO stage is:*

- a. Ib
- b. Ic
- c. IIb
- d. IIc

Q.281 *Rokitansky-Kuster-Hauser syndrome is associated with:*

- a. Ovarian agenesis
- b. Tubal agenesis
- c. Bicornuate uterus
- d. Vaginal agenesis

Q.282 *A young patient with post-coital bleeding, per speculum examination revealed normal cervix but Pap smear showed marked dyskaryotic cells—next step is:*

- a. Colposcopically guided biopsy
- b. Conization
- c. Culdoscopy
- d. Repeat Pap smear

ANSWERS

Ans 278. (a). See Dutta Gyne 6/e, p 311, Table 21.6.

Ans 279. (a). See Dutta Gyne 6/e, p 500

Ans 280. (b). See Dutta Gyne 6/e, p 374

Ans 281. (d). See Dutta Gyne 6/e, p 453, Table 28.1.

Ans 282. (a).

QUESTIONS

Q.283 *Sequence of pubertal development in girls is:*

- a. Thelarche, menarche, pubarche
- b. Menarche, thelarche, pubarche
- c. Thelarche, puberche, menarche
- d. Menarche, puberche, thelarche

Q.284 *Asymptomatic carrier of gonococcal infection in female lodges the organism in:*

- a. Endocervix
- b. Vagina
- c. Urethra
- d. Fornix

Q.285 *Masculinizing tumor of the ovary is:*

- a. Granulosa cell tumor
- b. Dysgerminoma
- c. Arrhenoblastoma
- d. Clear cell carcinoma

Q.286 *Cystic swelling in anterolateral wall of the vagina, impulse on coughing negative, most likely diagnosis is:*

- a. Bartholin's cyst
- b. Gartner duct cyst
- c. Cystocele
- d. Adenocarcinoma vagina

Q.287 *Least common symptoms in fibroid uterus is:*

- a. Menstrual disorder
- b. Malignancy
- c. Infertility
- d. Degeneration

ANSWERS

Ans 283. (c). See Dutta Gyne 6/e, p 49

Ans 284. (a).

Ans 285. (c). See Dutta Gyne 6/e, p 384.

Ans 286. (b). See Dutta Gyne 6/e, p 264.

Ans 287. (b). See Dutta Gyne 6/e, p 275-276.

QUESTIONS

Q.288 *Commonest site of genital tuberculosis is:*

- a. Ovary
- b. Tubes
- c. Uterus
- d. Cervix

Q.289 *Genital prolapse with external os lying outside the introitus but the fundus within the vagina. Degree of uterine descent is:*

- a. 1st degree
- b. 2nd degree
- c. 3rd degree
- d. Procidentia

Q.290 *Commonest degeneration in uterine fibroid is:*

- a. Sarcomatous degeneration
- b. Fatty degeneration
- c. Hyaline degeneration
- d. Red degeneration

Q.291 *Commonest complication of ovarian cyst is:*

- a. Torsion
- b. Rupture
- c. Malignancy
- d. Meigs' syndrome

Q.292 *Which is the deepest fornix of the vagina:*

- a. Anterior
- b. Left lateral
- c. Right lateral
- d. Posterior

ANSWERS

Ans 288. (b). See Dutta Gyne 6/e, p 137.

Ans 289. (b). See Dutta Gyne 6/e, p 205-206.

Ans 290. (c). See Dutta Gyne 6/e, p 275.

Ans 291. (a). See Dutta Gyne 6/e, p 298.

Ans 292. (d).

QUESTIONS

Q.293 *Prostate in male is homologous to which organ in female?*

- a. Cervical glands
- b. Bartholin's gland
- c. Skene's glands
- d. Paraurethral glands

Q.294 *Germ cell of the ovary originates from:*

- a. Celomic epithelium
- b. Ectoderm
- c. Endoderm of yolk sac
- d. Mesoderm of intermediate cell mass

Q.295 *All of the followings are suitable for MTP at 16–18 weeks except:*

- a. Dilatation and evacuation
- b. Intra-amniotic hypertonic saline
- c. Extra-amniotic ethacridine lactate
- d. Intravaginal misoprostol

Q.296 *Bartholin's gland is situated in the:*

- a. Superficial perineal pouch
- b. Deep perineal pouch
- c. Urogenital diaphragm
- d. None

Q.297 *High glycogen content of vaginal epithelium is due to:*

- a. Estrogen influence
- b. Progesterone influence
- c. Doderlein's bacillus
- d. Acidic vaginal pH

ANSWERS

Ans 293. (d). See Dutta Gyne 6/e, p 39.

Ans 294. (c). See Dutta Gyne 6/e, p 38.

Ans 295. (a).

Ans 296. (a).

Ans 297. (a). See Dutta Gyne 6/e, p 7.

QUESTIONS

Q.298 *Structure embryologically corresponding to gubernaculum testis is:*

- a. Round ligament
- b. Ovarian ligament
- c. Both
- d. None

Q.299 *Total number of oocytes at birth is:*

- a. 60,000
- b. 7 million
- c. 2 million
- d. 40,000

Q.300 *Which factor is not important in determining the sexual development of an individual?*

- a. Sex chromosomes
- b. Functioning ovary
- c. Functioning testis
- d. End organ response to gonadal activity

Q.301 *The gonad which is palpable outside abdominal cavity is almost always:*

- a. Ovary
- b. Testis
- c. Ovotestis
- d. Supernumerary

Q.302 *What is not a criteria for diagnosis of bacterial vaginosis?*

- a. Presence of 'clue-cells'
- b. Fishy odor of vaginal secretion on alkalization
- c. Plenty of lactobacilli
- d. Vaginal pH greater than 4.5

ANSWERS

Ans 298. (c).

Ans 299. (c). See Dutta Gyne 6/e, p 82.

Ans 300. (b). See Dutta Gyne 6/e, p 440.

Ans 301. (b).

Ans 302. (c). See Dutta Gyne 6/e, p 152.

QUESTIONS

Q.303 *Commonest causative organism for acute bartholinitis is:*

- a. *E. coli*
- b. Gonococcus
- c. Chlamydia
- d. *Gardnerella vaginalis*

Q.304 *Progression of CIN to invasive carcinoma is:*

- a. < 1%
- b. 5%
- c. 10%
- d. 15%

Q.305 *Pap test should include sample from:*

- a. Endocervix, ectocervix and vaginal pool
- b. Endocervix and exocervix
- c. Exocervix and vaginal pool
- d. Only exocervix

Q.306 *All may be etiologically related with endometrial cancer except:*

- a. Long menstrual life
- b. Late menarche
- c. Late menopause
- d. Nulliparity

Q.307 *What is the correct descending order of incidence of malignancy of female genital organs in India?*

- a. Endometrium, cervix, ovary
- b. Cervix, ovary, endometrium
- c. Ovary, cervix, endometrium
- d. Cervix, endometrium, ovary

ANSWERS

Ans 303. (a). See Dutta Gyne 6/e, p 161.

Ans 304. (a). See Dutta Gyne 6/e, p 323.

Ans 305. (b). See Dutta Gyne 6/e, p 110-111.

Ans 306. (b). See Dutta Gyne 6/e, p 354.

Ans 307. (b). See Dutta Gyne 6/e, p 333, Table 23.3.

QUESTIONS

Q.308 *According to the surgical staging of endometrial carcinoma, stage-IB means:*

- a. Myometrial invasion less than 1/2
- b. Uterine cavity length 8 cm or less
- c. Uterine cavity length more than 8 cm
- d. Myometrial invasion more than 1/2

Q.309 *The commonest ovarian malignancy is:*

- a. Serous cyst adenocarcinoma
- b. Mucinous cyst adenocarcinoma
- c. Malignant teratoma
- d. Endometrioid carcinoma

Q.310 *Signet ring cell is diagnostic of:*

- a. Brenner tumor
- b. Serous cyst adenocarcinoma
- c. Granulosa cell tumor
- d. Krukenberg's tumor

Q.311 *All are reasonably good time for insertion of IUCD except:*

- a. Postmenstruation
- b. Postabortion
- c. Immediately after delivery
- d. One week after delivery

Q.312 *Which is constant feature in the development and evolution of combined OC pill leading to the development of the currently used ones?*

- a. Gradual reduction in dose of estrogen
- b. Gradual reduction in dose of progesterone
- c. Use of newer progestones
- d. All of the above

ANSWERS

Ans 308. (a). See Dutta Gyne 6/e, p 357.

Ans 309. (a). See Dutta Gyne 6/e, p 371.

Ans 310. (d). See Dutta Gyne 6/e, p 387.

Ans 311. (d). See Dutta Gyne 6/e, p 480-481.

Ans 312. (d). See Dutta Gyne 6/e, p 486.

QUESTIONS

Q.313 *The most effective reversible contraceptive is:*

- a. IUCD
- b. Condom
- c. Combined OC pill
- d. Postcoital pill

Q.314 *The physiological prolactin inhibitory factor is*

- a. Dopamine
- b. Inhibin
- c. Endorphins
- d. Norepinephrine

Q.315 *Commonest cause of secondary amenorrhea is:*

- a. PCOD
- b. Pregnancy
- c. Genital tuberculosis
- d. Lactation

Q.316 *Commonest cause of urinary incontinence in female is:*

- a. Genitourinary fistula
- b. Stress incontinence
- c. Detrusor instability
- d. Overflow incontinence

Q.317 *Usually the first endocrinal evidence of approaching menopause is:*

- a. Raised FSH
- b. Raised LH
- c. Raised testosterone
- d. Decreased oestrogen

ANSWERS

Ans 313. (c).

Ans 314. (a). See Dutta Gyne 6/e, p 471.

Ans 315. (b). See Dutta Gyne 6/e, p 457.

Ans 316. (b). See Dutta Gyne 6/e, p 398.

Ans 317. (a). See Dutta Gyne 6/e, p 60.

QUESTIONS

Q.318 *Earliest histological evidence of ovulation is:*

- a. Coiling of spiral arterioles
- b. Stratification of endometrial epithelium
- c. Subnuclear vacuolation
- d. Increased mitotic figures

Q.319 *The followings are the branches of the anterior division of the internal iliac artery except:*

- a. Uterine
- b. Vaginal
- c. Superior gluteal
- d. Middle rectal

Q.320 *All are true about the fallopian tube except:*

- a. It measures 10 cm in length
- b. The mucous membrane is lined by columnar epithelium
- c. It is developed from the mesonephric duct
- d. It is supplied by the utero-ovarian vessels

Q.321 *Length of the round ligament is:*

- a. 5 cm
- b. 10 cm
- c. 15 cm
- d. 20 cm.

ANSWERS

Ans 318. (c). See Dutta Gyne 6/e, p 91.

Ans 319. (c). See Dutta Gyne 6/e, p 27.

Ans 320. (c). See Dutta Gyne 6/e, p 10.

Ans 321. (b). See Dutta Gyne 6/e, p 23.

QUESTIONS

Q.322 *The following are related to trichomonas vaginitis except:*

- a. It is a sexually transmitted disease
- b. The organism is a flagellated parasite
- c. The discharge is curdy white with flakes
- d. Hanging drop preparation is helpful to the diagnosis

Q.323 *To detect ovulation endometrial biopsy is ideally done on:*

- a. 14th day of the cycle
- b. 21st day of the cycle
- c. 28th day of the cycle
- d. Immediately after the bleeding stops

Q.324 *Regarding combined oral contraceptives all are correct except:*

- a. It regulates the menstrual cycle
- b. It prevents ovulation
- c. It protects against cervical malignancy
- d. It is not suitable for lactating women

Q.325 *In a normal menstrual cycle all are true except:*

- a. A mature graafian follicle measures about 20 mm
- b. Ovulation occurs due to the FSH surge
- c. Life span of corpus luteum is about 12–14 days
- d. In the luteal phase vaginal cytology shows preponderance of intermediate cells

ANSWERS

Ans 322. (c). See Dutta Gyne 6/e, p 163.

Ans 323. (b). See Dutta Gyne 6/e, p 240 Table 16.6.

Ans 324. (c). See Dutta Gyne 6/e, p 489.

Ans 325. (b). See Dutta Gyne 6/e, p 86.

QUESTIONS

Q.326 *In a normal menstrual cycle all are true except:*

- a. Corpus luteum is fully matured on D22–D23
- b. The follicles without FSH receptors, undergo atresia
- c. Basal zone of endometrium is not responsive to hormones
- d. In the secretory phase endometrial thickness is 6–7 mm

Q.327 *Regarding CuT IUCD all are true except:*

- a. Presence of HIV infection is a contraindication
- b. CuT 380A should be replaced by every 5 years
- c. Withdrawal technique is used for insertion
- d. Failure rate is about 0-2 per 100 women years

Q.328 *Regarding carcinoma of the ovary*

- a. Epithelial adenocarcinoma is the commonest
- b. Lymphatic spread commonly involves the pelvic lymph nodes
- c. It is symptomatic even in the early stage
- d. Chemotherapy is used as the primary treatment

Q.329 *Regarding pelvic endometriosis:*

- a. Rectovaginal septum is the commonest site.
- b. Symptoms are directly proportion to the extent of lesion
- c. Infertility is mainly due to tubal block
- d. Often there is progressive secondary dysmenorrhea

ANSWERS

Ans 326. (a). See Dutta Gyne 6/e, p 87.

Ans 327. (b). See Dutta Gyne 6/e, p 479-480.

Ans 328. (a). See Dutta Gyne 6/e, p 371.

Ans 329. (d). See Dutta Gyne 6/e, p 307.

CHAPTER

18

History in Obstetrics and Gynecology

Chapter Objectives

- Eminent personalities with their contributions in the speciality are a few.
- It is good for a candidate to have some knowledge about them
- A candidate with this knowledge, certainly has an edge over to one who has not.

List of eminent personalities with their contributions in Obstetrics and Gynecology has been presented in this section. Sometimes questions are asked by the examiner in relation to such personalities with their contributions. Failure to answer such question is not going to fail the candidate, but certainly this improves the impression upon the candidate if he/she could answer it.

EPONYMS IN MEDICINE

| | |
|---|---|
| Allis Oscar Huntington | see p 490 |
| Andrews, Henry (1871-1942) | Consultant Obstetrician and Gynecologist working at London Hospital. His name is associated with Brandt-Andrews maneuvers; which describes the procedure of delivery of the placenta by controlled cord traction and suprapubic pressure. Brandt, Thure (1819-1895) Obstetricians and Gynecologist from Stockholm. |
| Apgar, Virginia (1909-1974) | Anesthetist working in America. She introduced “ Apgar Score ” for assessment of cardiopulmonary and neurological status of the new born at birth. This was described in 1953. Virginia Apgar's newborn score is used almost universally. Apgar was a popular musician and played cello and violin. Virginia Apgar died in her sleep on 7 August 1974. |
| Bonney, William Frances Victor (1872-1953) | see p 494 |
| Braxton-Hicks, John (1825-1997) | Obstetrician and Gynecologist at Guy's Hospital London. He described intermittent painless uterine contractions during pregnancy. “Braxton-Hicks Contractions” in 1871. He also described bipolar (combined external and internal) version in 1860. |
| Christian Doppler, Johann (1803-1853) | Austrian Physicist and Mathematician. Doppler effect of ultrasound was described by him in 1842. |
| Das Sir K.N. | Consultant Obstetrician and Gynecologist and Principal of Carmichael (now R.G. Kar) Medical College, Calcutta. He designed a special variety of long curved obstetric forceps suited for the Indian women, whose pelvis and baby sizes are comparatively small to the Western countries. This is popularly known as the Das's variety of obstetric forceps. |

| | |
|--|---|
| Deaver John Blair | see p 500 |
| Federich Shauta | see p 542 |
| Foley Frederick Eugene Basil | see p 480 |
| Green-Armytage, Vivian Bartly (1882-1961) | MB, Captain Indian Medical Service. He was the resident surgeon at Eden Hospital, Calcutta (1912). Later he became the Professor of Obstetrics in the same department. He also worked in West London Hospital. He devised the forceps, "Green Armytage forceps" for holding the uterine incision margins and the angles during Caesarean section. |
| Hegar, Alfred (1830-1914) | Professor of Obstetrics and Gynecology in Freiburg. He designed the metallic graded cervical dilators, Hegar's dilator. |
| James Ire | see p 472 |
| Herbert Trout | see p 472 |
| Krukenberg, Friedrich (1871-1946) | Pathologist and Professor of Ophthalmology, Halle. He described Krukenberg tumor in 1896. |
| Leventhal, Michael (1901-1973) | American Obstetrician and Gynecologist. He along with Stein, Irving from Chicago, described Stein-Leventhal syndrome (Polycystic ovarian syndrome) in 1935. |
| Menon, K. Krishna (1908-1988) | Gynecologist from Madras (presently Chennai), served the Indian Medical Service in the second world war. He was the Professor of Obstetrics and Gynecology at Madras Medical College and Stanley Medical College. He became the Director Professor of the Institute of Obstetrics and Gynecology at madras (Currently chennai) Medical College and Government hospital for women and children. He was a visiting professor in Britain and united States. Menon became the President of Federation of Obstetrics and Gynecological Societies of India in 1961 and honorary Fellow of the Royal College of Obstetricians and Gynecologists. He was awarded "Padma Shri" in 1973 by the President of India. Menon presented his results using, Lytic Cocktail in the management of eclampsia at the University College Hospital, London in 1960. He spoke with his own experience from the hospital that he worked. Menon's monumental work on "lytic cocktail" using phenothiazine and pethidine in eclampsia was published in Jr. Obstet. Gynecol, Br. Common W. 1961; 68: 417-26. |

| | |
|---|---|
| Mitra, Subodh (1896-1961) | Gynecological Cancer Surgeon and Vice-chancellor, University of Calcutta, India. He is remembered for his new technique of operation, "Radical vaginal hysterectomy with bilateral extra-peritoneal pelvic lymphadenectomy". This operation is popularly known as "Mitra's operation for cancer of the cervix". |
| Naegele, Franz Carl (1778-1851) | Franz Carl Naegele is remembered for three things: Pelvic deformity, Naegele's obliquity (anterior asyclitism). Franz Carl naegele was born in Dusseldorf, Germany. He was the Director at the University of Heidelberg, succeeding his father-in-law in the position. |
| Palmer, Raoul (1905-1985) | Raoul Palmer used laparoscopy in Gynecology in 1943. Besides laparoscopy, he was also a noted surgeon for his skills in tubal and vaginal surgery, 'Palmer's Point' in laparoscopic surgery goes by this name. He assisted Vivian Green-armytage, while in Paris, in vaginal hysterectomy operation. |
| Pantaleoni, D. Commander (C. 1869) | Pantaleoni made the first report on the use of endoscope (hysteroscope) to diagnose and treat an intrauterine lesion in 1869. Initial works on hysteroscope was done by philipp Bozzini in 1805. Initial hysteroscopy use was made by paraffin lamp illumination as devised by Francis Cruse of Dublin in 1865. It took more than a century for diagnostic and operative hysteroscopy to become popular. |
| Papanicolaou, George Nicholas | see p 472 |
| Purandare, B.N. (1911-1990) | Gynecologist from Mumbai, India, is recognised by his abdominal cervicopexy operation for cases with nulliparous prolapse (Prolapse without a cystocele). |
| Shirodkar, V.N. (1899-1971) | Gynecologist from Grant Medical College, Mumbai, India. He introduced "Shirodkar's Stitch" cervical circlage operation in 1955, for cases with cervical incompetence and recurrent mid-trimester abortion. He was the President of the Federation of Obstetric and Gynecological Societies of India. |
| Sims, James Marion (1813-1883) | see p 474 |
| Spencer Wells Thomas | see p 501 |
| Turner Henry (1892-1970) | Professor of Medicine, Oklahoma University, USA. He described Turner's syndrome, (Ovarian dysgenesis 45XO). He became the doyen of clinical endocrinology in United States. He diagnosed his own lung cancer as inoperable. He worked until his death on 4th August, 1970. |

| | |
|--|--|
| Vigineaud, Vincent Du (1901-1978) | Revolution in the use of oxytocic drugs was made with the identification and synthesis of oxytocin in 1953. Working in the department of biochemistry of Cornell University Medical College, Vigineaud and his colleagues identified and synthesised the hormone oxytocin and also vasopressin. Du Vigineaud received the Nobel Prize for chemistry in 1955 for his landmark research in identification and synthesis of posterior pituitary hormones. |
| Wertheim Ernst | see p 542 |

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