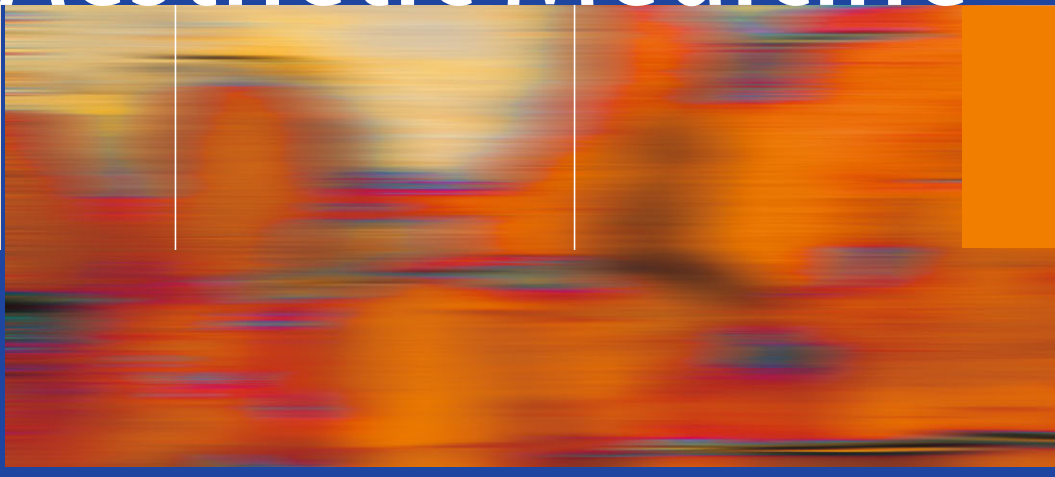
Mauricio de Maio
Berthold Rzany

The Male Patient in Aesthetic Medicine



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Foreword (I)

Over the last 100 years, life expectancy in Europe has increased by 25-30 years. What used to be old age has now become middle age. Not only do people live to a greater age but they feel younger for longer. If you feel younger, it is natural to want to look younger. People who feel young do not want to be perceived as old. Given the enormous advances in rejuvenation techniques, it is natural that men should now be following women in wishing to take advantage of the opportunity to look well and less ravaged by time and sun. Male rejuvenation has now come of age.

Mauricio de Maio and Berthold Rzany's "The Male Patient in Aesthetic Medicine" is comprehensive, informative and authoritative. They describe the full range of male dermatological aesthetics. They do so at a moment when interest in this particular area is growing as men begin to catch up with women. The text is enriched by excellent photographs, helpful do's and don'ts sections and key pointers. Up to the minute and well researched references ensure that the authors' statements are, wherever possible, evidence based.

Of course, there are many similarities and some differences between men and women. One intriguing difference is highlighted in the section on fillers, where the authors emphasise the importance of never letting *male* patients feel pain during aesthetic procedures as any negative experience may lead the *male* patient to discontinue facial treatments. Women are more hardy than men or at least more prepared to put up with discomfort in the pursuit of their aesthetic goal.

This excellent text book will assist immensely physicians and surgeons working in this field.

April 2009

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Foreword (II)

It is truly an honor for me to write this foreword to The Male Patient in Aesthetic Medicine. The authors Dr. Mauricio de Maio and Dr. Berthold Rzany are truly experts in the field. Having published extensively on aesthetic medicine, they bring perspectives from two continents. The text has been written with the view of dual specialties, dermatology and plastic surgery, with each bringing unique approaches.

Male patients are being seen in increasing numbers by aesthetic physicians. Men seek treatment often due to a simple desire to improve their appearance. This may reflect the fact that they have experienced facial changes related to aging or photoaging. It may result from the fact that society in general is becoming more aesthetically oriented. Many other men seek aesthetic improvements to keep a young and vital appearance while being active in the workforce. We all have patients whose cosmetic improvement has helped maximize their retention within a company or increased employment opportunities.

This text is a practical approach. It applies the science and art of aesthetics specifically to the male patient. The authors share practical, up-to-date tips which physicians can use in their day-to-day treatment of men. This text is a superb condensation of the approaches many of us are currently using. This text is suitable for practitioners in a busy clinic, the advanced practitioner, or physicians beginning to enter the aesthetic medicine arena.

The subjects that the authors have included are comprehensive. They have reviewed the aesthetics of the male face. It is important for the treating physician to understand how the male aesthetic is different from the female. Often, uneducated physicians may in error apply a female aesthetic to a male patient, which results in an undesirable appearance. Arched eyebrows seen in a man or a feminine lip on a male face often looks odd. The authors have discussed patient selection as applied to the male patient. Because there are fewer male patients seen than female, one must be careful in selecting the proper male patient. The topics of toxins and fillers have been eloquently discussed. Skin care and resurfacing are well developed. The authors end with a discussion on scalpel surgery in males as well a valuable discussion on the undesirable result.

Aesthetic surgery is a field exhibiting remarkably rapid growth. The specialty of aesthetic medicine has had its roots firmly grounded in the care of the patient who wants to look “a little better,” but its branches are now raised high with good, sound, basic research being applied. Because of the cooperative and collaborative relationships which

are growing among core specialists in the aesthetic field, aesthetic medicine is advancing exponentially. The two authors of this text have worked together to provide a knowledgeable and practical approach to the male patient in aesthetic medicine.

April 2009

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Preface

Men are different from women in many ways. Male aesthetics are different from female aesthetics. Most readers would agree with this statement. However, as the majority of our patients are still female, even cosmetic physicians may tend to treat their male patients like female patients. This can lead to dissatisfaction of the patient and consequently of the cosmetic physician.

As the demand for aesthetic procedures in male patients is rising, there is a need for good textbooks on this subject. The aim of this book is to explain the specifities of the ageing process and facial aesthetics in men and to present the treatments available. In addition, common skin conditions and diseases that also influence the male aesthetic appearance will be discussed.

The book written from the perspectives of a plastic surgeon and a dermatologist should enable us to treat our male patients better, and by that increase the satisfaction of our patients and, last not least, our satisfaction as the treating physicians.

Sao Paulo — Mauricio de Maio
Berlin — Berthold Rzany
December 2008

Acknowledgments

Like our first two books, this book would not have been possible without the work of many others. Specifically, our thanks go to our patients who helped us to be where we are now, especially those who contributed their photographs for this book.

For the German team:

We thank Mr. Frank Bachmann for his help on the content and format of this book; especially, for helping us in building the background chapters on ageing. We thank Mr. Tobias Gottermeier, again, for the excellent photographs and the graphic work. Last not least, we thank Martin Hussain who had the tedious task of formatting the book.

For the Brazilian team:

Our thanks to Mr. Helvio Piva, Mrs. Liliann Cristina Amoroso, Dr. Celso Pieralini, and Ms. Ivy Ofenbock Magri for helping with the updated references of male patients' treatments, and especially, the clinical assistants Ms. Amanda Rocha Ribeiro Cruz, Ms. Carla Roberta Batista, Ms. Daniele Ferreira de Souza, Ms. Elaine Aguinalda da Silva, and Ms. Patrícia Aquino, who have a wonderful careful way with my patients.

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Abbreviations

AGA	Androgenetic alopecia
AHA	Alpha hydroxy acid
BDD	Body dysmorphic disorder
BMI	Body mass index
BoNT-A	Botulinum toxin A
COX	Cyclooxigenase
DAO	M. depressor anguli oris
EPA	Eicosapentaenoic acid
Er	Erbium
FAQs	Frequently asked questions
FXCO2	Fractional CO_2
HA	Hyaluronic acid
HgB	Hemoglobin
IPL	Intense pulse light
IR (laser)	Infrared
KTP laser	Potassium titanium oxide phosphate laser
LED	Laser enabled system status
MMP	Matrix metalloproteases
NFSR	Nonablative fractional resurfacing
PDL laser	Pulse dye laser
PIH	Postinflammatory hyperpigmentation
PMMA	Polymethylmethacrylate
RCT	Randomised Controlled Trial
RNA	Ribonucleic acid
ROS	Reactive oxygen species
SMAS	Superficial muscular aponeurotic system

TCA	Trichloroacetic acid
TGF	Transforming growth factor
YAG	Yttrium-Aluminum-Garnet

Facial Aesthetics in Male Patients

1

Mauricio de Maio

1.1 Introduction

The human face presents an incredible array of emotions, which are an integral element to beauty. This is consistent with the observation that beauty exists in many forms and that many beautiful faces do exhibit imperfections in one or more features. Some of those imperfections that are not acceptable in women may be pleasant in men.

The ancient Greeks concluded that beauty is best described as an intuitive appreciation of the symmetry, balance, and harmony that exist between the various facial features. Even with a perfectly proportioned face, there is huge variation in coloring and in the shapes of each facial feature (eyes, eyebrows, lips, nose, chin, etc.) that combine to result in a distinctive appearance of each race and provide for endless variations in beauty that are unique as each individual.

Developmentally all human faces begin as essentially feminine – even if genetically male. The genetic male face gradually transforms into the male configuration through multiple exposures to testosterone. The female is considered to be the "more attractive" sex in the human species and so is the female face. It results from the necessary strategy to attract a mate, and so women evolved to become physically more attractive or beautiful than males. Interestingly, not only men find women attractive, but also other women, children, and even infants do.

Visual attractiveness strategy is seen in the animal world, where males are usually more attractive than females, who are the "mate choosers." Male animals have evolved to be the more beautiful sex, and it is represented by intense and unique colors and usually by courtship rituals. In our species, a male is attractive in a different way than female so much that to refer to or call a male "beautiful" is actually not a compliment to most males. Males are attractive when they are powerful, intelligent, and rich. So, why should a man look good then? So that he becomes more powerful, more intelligent, and richer!

1.2 Facial Landmarks

There is a strong revival of interest and enthusiasm for the Greek and Roman beauty style. In addition to beautiful bodies, dramatic contours of the face accented by strong noses, significant malar–midface configurations, and sharp, well-defined jaw lines have become

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hallmarks of contemporary male patterns. Concepts and standards of facial beauty have always been associated with anatomic contours of facial form. These contours are a result of the location, volume, and mass of the facial soft tissues, as well as their relationship to the underlying facial skeleton. The rapid assimilation and mixing of many ethnic groups has contributed to new standards of ideal facial beauty.

The skin and subcutaneous tissues are the foundation of the face, and their smooth distribution over the facial framework produces the healthy aspect presented in a male face. Both the skin and the hair contribute significantly to the overall perceived aesthetic of the face. However, it is the anatomic configurations of volume and mass that determine the uniqueness of a pleasant male face. The important contours include the malar–midface, the jaw line, and the nasal frontal projections. The major determinants of aesthetic facial beauty consist of a combination of both soft tissue and bony skeletal elements. The three major landmarks of volume and mass that dominate facial topography include (1) the nose, (2) the zygomatic prominences, and (3) the chin and jaw line (Fig. 1.1a). Secondary landmarks include the supraorbital ridges, the temporal contours, the premaxilla, and the suborbital region (Fig. 1.1b). Other aspects also contribute for creating or restoring facial harmony and balance and include the perioral and nasolabial region, the suborbital valley, and the central perinasal premaxilla (Fig. 1.1c). Lips, eyes, and eyebrows govern our attention in interpersonal communication and are responsible for the individuality in appearance for each person (Fig. 1.1d).

Initial visual impression is considered important in human and professional affairs. General appearance, clothing, hair, posture, movement, voice, attitude, liveliness, responsiveness, etc. are taken into account and require minimum effort. Appraisal and objective evaluations are at best inexact and subject to different points of view. Culture, ethnicity, experience, expectation may influenced judgement. The observer can and should be aware of personal inadequacy relative to capacity to perceive symmetry and asymmetry and illusion that may distort his perception of reality.

Do's

- Do check the shape of the head and the shape of the male face.
- Do compare the relative volumes of the head and face, as well as the forehead, the middle and lower face of the male patient.
- Do check the relative proportion of the face before analyzing individual features such as size, shape, contour, texture, and color.

Don'ts

- Do not forget to note the regularity and consonance of curves and angles in a male face.
- Do not forget that male faces should be described in profile in terms of convexity, concavity, or facial inclination.

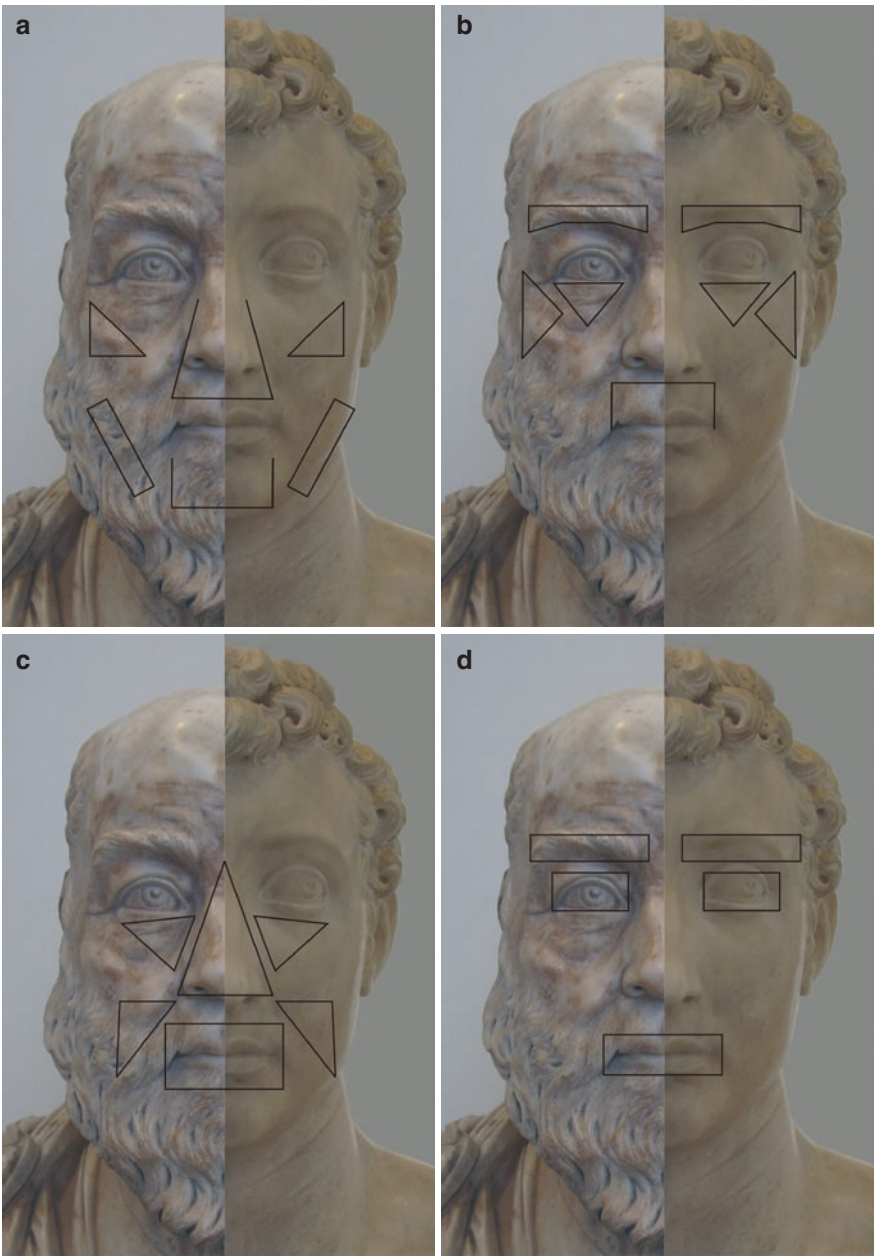

Fig. 1.1 (**a**) First step of the facial analysis: nose, cheekbones, chin, and jaw line. (**b**) Second step of the facial analysis: supraorbital ridges, temporal contours, premaxilla and suborbital region. (**c**) Third step of the facial analysis: perioral and nasolabial region, suborbital valley, and central perinasal premaxilla. (**d**) Fourth step of the facial analysis: lips, eyes, and eyebrows. Nota bene: the photo was morphed from two sculptures from the Bode Museum, Berlin.

1

FAQs

Which is the sequence of quick facial analysis in a male patient?
A quick facial analysis can be made as follows:

- *First level*: nose, cheekbones, chin, and jaw line (Fig. 1.1a)
- *Second level*: supraorbital ridges, temporal contours, premaxilla and suborbital region (Fig. 1.1b)
- *Third level*: perioral and nasolabial region, suborbital valley, and central perinasal premaxilla (Fig. 1.1c)
- *Fourth level*: lips, eyes, and eyebrows (Fig. 1.1d)

1.3 Golden Proportion

The golden proportion, a concept from Greeks, could be applied to art, architecture, music, the human body and aesthetics, in general.

The golden number called "phi" is named after Phidias, the renowned sculptor. The golden section is a line in which the shorter portion is labeled as AB and the longer portion as BC. The equation is AB is to BC as BC is to AC. The rectangle formed with sides of 1 × 1.618 is golden, and a triangle with a base of 1 and sides that are 1.618 is golden. A pentagram is formed of five triangles, each of which is found to be golden.

Medical science has established that our perception of physical beauty is wired hard into our being and is based on how closely one's features reflect phi in their proportions. Stephen Marquardt (http://www.beautyanalysis) has developed a beauty mask that can be adapted to both genders and all races and can analyze the face and its deviation from the ideal. This mask uses the pentagon and decagon as its foundation, which embody phi in all their dimensions.

1.4 The Facial Aesthetic Units

The distribution of volume and mass is nearly equal among the three facial segments: upper, mid, and lower. The upper facial aesthetic segment extends from the hairline to the superior orbital rim. It includes the eyebrows, the glabella–frontal region, and the supraorbital bony ridge contour. The mid third unit extends from the lateral canthi to the superior border of Cupid's bow. This level is of major importance to the illusion of facial beauty and attractiveness, where the two most important mass landmarks are the nose and the malar region. It also contains major soft tissue contour units overlying bony configurations. The main focal points in the face when an individual is viewed (the eyes and the orbital regions) are also found in the mid third unit. The lower third is the premandible-jawline segment of the face, which extends from the lateral commissure of the mouth to the lowest point of the central chin. This segment is usually deficient in the general population. It is frequently short vertically, horizontally, or in its anterior–posterior projection.

Fig. 1.2 Male adult with oval shape of the face and strong corrugators. Patients with dark skin complexion easily develop hyperpigmented spots on the face.

There are several facial forms, which include the round, the oval, the square or broad, the pear-shaped, the triangular and inverted triangular, and the elongated and narrow one (Fig. 1.2). These shapes are influenced by the volume, mass, color, and configuration of the hair types and styles that frame them. Shorter hair, as an example, may create an illusion of increased facial size and volume. The three facial units vary considerably in excess and in deficiencies of volume and mass size. So, visual impression of the other segments will be relatively of different magnitude. The basic principle in facial balance is that a diminution or enhancement of size in one aesthetic unit or facial zone directly or inversely affects the aesthetic impact of the others. The enlargement of the mandibular and midface regions will effectively reduce the relative significance of the nose to the rest of the face. Even minor alterations in facial subunits such as a prominent nasolabial fold or deep glabella lines may impose a strong visual impact on facial aesthetic balance.

Key pointers

- The relative widths and positions of features can easily be assessed noting that the eyes are slightly greater than one eye-width apart.
- A line dropped from the pupil corresponds to the width of the mouth.
- The base of the nose is slightly wider than a line dropped from the medial canthus.
- In profile, the orbital rim is anterior to the eye both superiorly and inferiorly.
- The profile line of the cheek is parallel to the nasal bridge.
- The upper lip preceeds the lower lip.
- The chin resides in relationship to a line dropped from the glabella and the lower lip.

1.5 Men and Women

Important landmarks regarding gender must be remembered before suggesting any treatment for male patients. Knowledge of the differences in facial features enables a more natural result and less risk to feminize the male's face. Women have more prominent upper facial characteristics, with a gradual taper in facial silhouette from upper to lower. Men, however, have squarer face and more angled with larger jaws and equally balanced upper and lower facial proportions.

1.5.1 Eyebrows

Male eyebrows are usually flatter and narrower. In general, genetically speaking, male eyebrows are lower both in the medial, intermediate, and lateral aspects when compared with that of women. Brow ptosis is a common feature seen in male patients not only during the ageing process. Interestingly, mild brow ptosis in male patient gives an impression of leadership and power. In severe cases, it is seen primarily as a sign of anger (Coleman and Carruthers 2006).

The eyebrow is an integral part of the upper third anatomy. In women, the eyebrow tends to be just above the orbital rim and tends to have a pleasant arch peaking in the lateral third, a central medial downward slope with the medial head of the eyebrow at or just below the rim (Freund and Nolan 1996). In the male patients, the brow is flatter in contour and sits along the orbital rim as compared with the female brow. The male eyebrow should have a flat radius of curvature. The average location of the inferior border of the male eyebrow is approximately 11mm above the pupil and lateral canthus. The lateral brow is more prominent and fuller and the redundant upper eyelid gives a masculine look (Gunter and Antrobus 1997). While the ideal female face exhibits a smooth forehead with arched eyebrows, the ideal male face has a muscular forehead with an overhanging horizontal brow (Figs.1.3 and 1.4a, b).

Horizontal forehead lines usually appear earlier in male patients than in females. Men tend to compensate the low brow position and upper eyelid skin excess with frontalis contraction.

1.5.2 Eyes

Facial symmetry is one of the most important components of beauty. The periorbital region perhaps exhibits the highest incidence of asymmetry (congenital or resulting from ageing process) of any facial component. In contrast to women, men do not need to have an accentuated fold or sulcus in the upper eyelid nor an evident concavity overlying the superior palpebral fold. However, the ideal lower eyelid position must respect the same aspect independent of gender. It must be at or slightly above the level of the inferior limbus; otherwise, a scleral show may be present, which may resemble the senile ectropium. In an occasional young individual, scleral show is congenital and may be considered an

Fig. 1.3 Typical difference of a young male and female. The male eyebrow is lower and the lateral aspect of the orbit does not present the puffiness encountered in females. Usually the lips are thinner and the face is less rounded.

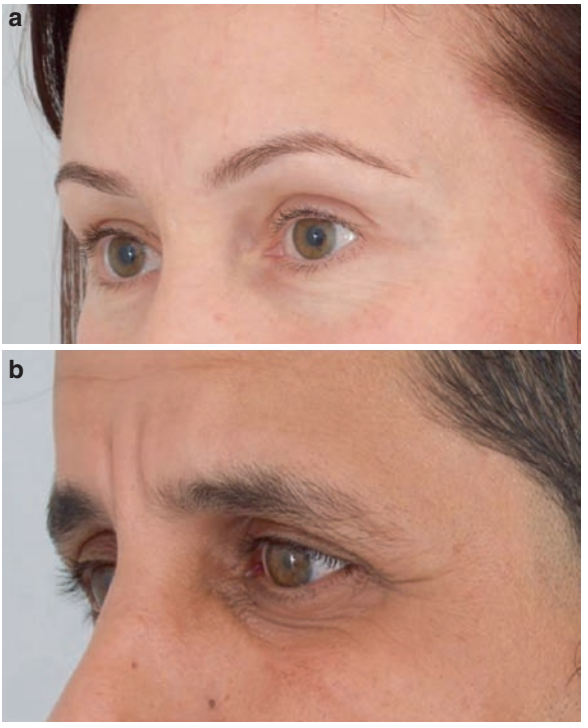

Fig. 1.4 **a**, **b** A typical difference between males and females at the eye and eyebrow complex. The female eyebrow is higher and above the orbit while that of male is flatter. The presence of wrinkles in the glabella and forehead is also a common finding in male adults.

Fig. 1.5 **a**–**c** The eye and eyebrow complex. The first photo (**a**) is from an adolescent. Please observe the skin quality in contrast to the other two male adults (**b** and **c**) in the mid-forties. A negative aspect of the adolescent is the presence of orbicularis oculi hypertrophy, prominent tear-trough, and a mild scleral similar to the adult male in (**c**)

element of beauty. Male eyes are narrower or less wide open and eyelids slightly closed. The prominent supraorbital ridges, the frontal bossing, result in deep-set appearance of eyes in males. Deep-set eyes occur in patients with prominent supraorbital ridge. The deeper the area below the supraorbital rim, the lower the eyebrow position relative to the ridge and the eye. Thus, patients with deep-set eyes have a lower brow position throughout life. The deeper the sulcus, the larger the convexity between the eyelid and the eyebrow, as the skin stretches around the superior orbital rim. It is not uncommon to find slight edema at the upper eyelid due to the low position of the medial aspect of the male eyebrow.

Another feature should be analyzed while evaluating the lower eyelid area. In some male patients, the tear-trough may be relatively deeper due to muscular projection at the subciliary region. This is called hypertrophy of the orbicularis oculi pars palpebralis and is a common finding in male patients (Fig. 1.5a–c).

1.5.3 Cheekbones and Mandible

The male maxilla, muscles of mastication, and mandible are sturdier than that in a woman of similar age. Very projected cheekbones are considered a feminine sign. A young adult

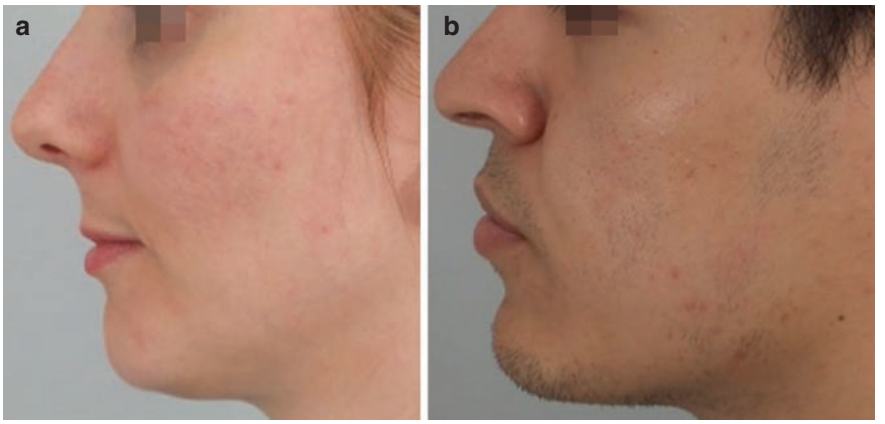

Fig. 1.6 **a**, **b** Comparison of the female and male face: the cheekbones should be higher in females in contrast to that of male adults. Note that the nasolabial angle is more open in the female than in the males.

woman has a more heart-shaped face than a young man. Male face is usually squarer and the jaws are stronger. Mandible projection is more acceptable in males than in females. The skeletonized appearance of the orbital margin may be naturally present in very thin or older male individuals. Young male patients with flatness at the cheekbone level may appear older (Fig. 1.6a, b).

1.5.4 Nose

The nose is usually slightly longer or wider in male patients. The width of the body of the nose should be 80% the width of the nose at the alar bases, assuming the width at the alar bases is normal. The width of the alar base should be approximately the same as the intercanthal distance, which should be the same as the width of an eye. There is a preference of a 95°–100° nasolabial angle in women and approximately 90°–95° in men. In a short male person, the nose may be slightly more rotated than in a tall person (Fig. 1.7a, b).

1.5.5 Lip–Chin Complex

The desired relationship of the lip–chin complex is an upper lip that projects approximately 2mm more than the lower lip. Ideal chin projection is 3mm posterior to the nose chin plane, which is defined as a line extending from a point one-half the distance of the ideal nasal length through the upper and lower lip vermillion (Byrd and Burt 2002) (Fig. 1.8). In women, the chin lies slightly posterior to the lower lip, and

Fig. 1.7 **a**, **b** Two different types of male noses. The one on the right is acceptable in a male's face but it would be unpleasant in a female's face.

in men, it is slightly stronger. Men have larger mouths with slight thinner lips, especially the upper lip. The smaller, feminine mouth has full vermillion lips with an upturn at the commissures (Chatham 2005) (Fig. 1.9). Some patients have a tension lip, which is characterized by fullness at the columellar–labial angle and a thin lip and a vermillion surface that appears retracted. This is most often seen in patients with overprojecting noses.

1.6 Ageing

Facial ageing is recognized as a loss of volume (loss of underlying soft tissue support), skin wrinkling, and skin folding (Monheit 2005). Over time, skin becomes progressively thinner, drier, less elastic, and less resilient, and as a result of the loss of elasticity, facial skin becomes more lax. Wrinkles are formed, and jowls are created by ptosis of the facial portion of the platysma muscle and an altered distribution of fat under the chin (Zimbler et al. 2001) (Figs.1.10 and 1.11).

The bone in ridge areas of the face tends to coarsen with age, leading to an increase in width, depth, and projection of the ridge structures. The soft tissue overlying the bone tends to expand and thin, leading to redundancy. Brow ptosis is defined when the eyebrow

Fig. 1.8 The desired relationship of the lip–chin complex is an upper lip that projects approximately 2mm more than the lower lip. Ideal chin projection is 3mm posterior to the nose–chin plane. This male adult presents a strong chin that is rotating upwards and his profile is not balanced.

falls significantly below the orbital rim. There are dense attachments underneath the brow fat pad that secure the eyebrow to the supraorbital ridge, which do not extend laterally and which may be the reason for the occurrence of lateral hooding in the upper eyelid. Later changes include the coarsening of the supraorbital ridge and soft tissue thinning with loss of skin elasticity and subbrow fat pad deflation, which leads to a three-dimensional collapse of the eyebrow. The tear-trough becomes deeper due to loss of facial volume, the descent of the globe and the malar fat pad. Skin darkening may increase because of the shadowing of the medial orbital fat pad (Fig. 1.12). Volume loss is greatest in the lower one-third of the face at all tissue levels from intrinsic ageing. This is most apparent in the perioral area, resulting in thin, atrophic lips, marionette lines, and nasolabial folds and grooves (Fig. 1.13). There is always a tendency of the lips to become thinner. Male patients who already have genetically thin lips will evolve worse. Volume loss within the middle third produces pronounced cheek hollowing with sagging jowls. Drooping of the

Fig. 1.9 A comparison between a male and a female adult of the same age. It is common to find male patients with more photodamage than females. Thinner lips and lower eyebrows are mostly found in male patients. Women usually present more jowls than do males of the same age.

Fig. 1.10 Young male compared with a senior adult with signs of intrinsic and extrinsic ageing. The whole facial area is covered with multiple hyperpigmented spots and multiple static wrinkles. Because of volume loss, deeper furrows and saggy skin are also present. The position of the eyebrow gets lower and the nose elongates and the tip drops down. There is skin excess both in the upper and lower eyelid. Thinning of the lips and loss of their landmarks can be noticed. The mandible contour presents skin laxity. Note the receding hair.

Fig. 1.11 The loss of fat content in the ageing process leads to deep furrows and saggy skin. The fat content is very helpful to avoid deformation of soft tissues in the face.

tip of the nose also occurs. Characteristic signs of the ageing neck include lipodystrophy, platysmal bands (lateral and medial), and nasolabial jowls that extend into the neck. These deformities are the result of skin laxity, platysmal ptosis and redundancy, ptosis of the submental fat pad, and prominent submandibular salivary glands or digastric muscles. These deformities may also be compounded by a recessed chin and a prominent, low-set hyoid (Castro 1980) (Figs.1.14–1.17).

1.7 A New Trend?

Some researches have been conducted to specify what would attract females towards a male face. Amazingly, it was pointed out that a slightly girly looks would be the trend nowadays. Males with large expressive eyes set in a smooth-skinned symmetrical face, a straight nose, and rounded hair and jaw line would be the features that modern women would mostly be attracted to. Smooth skin in men conveys an absence of inherited disease or damage. It means that caring feminine traits would be more pleasant than more macho markings. The rise of feminine appeal in a male face is a modern trait. They associate it with co-operation, honesty, and parental ability. Bearded men and any other feature that suggest that they are unlikely to wash up really withdraw women's attention.

Fig. 1.12 Typical male patient skin: thicker, oily and with large pores. The presence of mild sunken eyes and darkening in the lower eyelid is also common among male adults.

Fig. 1.13 These two male adults have a age difference of 20 years. Observe the photodamage in males with fair skin. Lowering of the eyebrows, thinning of the lips, fat deposit under the chin, and saggy skin are common features found in ageing process.

The "new man" is the one who presents domestic attributes that her friends can admire at a party, but definitely can be trusted not to go home with one of them. Another interesting aspect is that women are most attracted to a man with features representing the "average." The reason is that those genes survived down the evolutionary process, and are therefore less likely to be harmful.

Fig.1.14 Note the difference in the quality of the skin. The medial aspect of the eyebrow lowers due to hypertonicity of the corrugators and procerus. Observe the descendent line at the oral commissure in the male adult when compared with that of the adolescent, which is ascendent and upwards.

Fig.1.15 At the age of 40, there are some modifications that can be easily noticed. Excess skin in the upper eyelid and the appearance of a prominent nasolabial fold are the most common features at this period. Notice the difference of distribution in volume. With time, there is a concentration of volume in the lower third of the face.

Fig.1.16 Two male adults at forties. Note the difference in the shape of the face. On the right side, position of the eyebrow is lower and he will probably develop excess upper skin than that in the left. The male on the left has thinner and less proportionate lips.

Fig. 1.17 Two different male adults of the same age. Observe the difference in volume content and the presence of wrinkles, folds, and saggy skin. The lack of fat and the presence of photoageing result in an older aspect of the face.

Key pointers

- Strongly masculine features are considered threatening and less attractive, but there is still the need of masculine features to guarantee dominance.

FAQs

Who are the most attractive known men?
According to Cosmopolitan magazine, David Beckham and George Clooney are today's desirable males. Few cite Jude Law and Brad Pitt. Leonardo DiCaprio's look would be too girlish to attract the mainstream. The super-masculine young Arnold Schwarzenegger-type would be too aggressive and promiscuous to be a reliable partner.

1.8 The Goal of Cosmetic Procedures in Male Patients

What should be focused when treating male patients, anyway? Physical cosmetic beauty is desirable because it drives universal attention for women, but what about beauty in men? Specific concepts of physical beauty vary from culture to culture, civilization to civilization, and century to century. The goal for male patients involves two important functions: restoration and enhancement.

Restoration or cosmetic correction is for the improvement of a facial area or structure that has modified due to ageing process. The target is to rejuvenate the face. Cosmetic enhancement, on the other hand, is to make something better, making a face more attractive. Whenever a male face is analyzed into the classical thirds or structure by structure, a question should be raised by the physician: Should I restore it or should I promote a cosmetic enhancement?

Top ten key pointers

- Leonardo Da Vinci demonstrated that an aesthetically pleasing face is five times wider than the length of the horizontal eyelid fissure and equally divided in horizontal thirds.
- The relative balance of mass and volume from both bone structure and soft tissue given to faces forms the aspect of attractiveness or beauty.
- Males have evolved to be perceived as attractive to the degree that they physically appear more intimidating and protective with evident sexual differentiation (non-female look) from female feature.
- Physical features are driven by indicators of health, youth, and fertility that humans have evolved to look for potential mates. Advances in cosmetic procedures and other body modifying techniques are considered important items in our society nowadays.
- Racial differences will be a thing of the past, as interbreeding will produce more and more a coffee-colored skin tone.

- Facial balance means that if one aesthetic unit is diminished or enhanced in size, the others are directly or inversely affected.
- In male patients, when the nasal mass and projection are reduced, the midface and lower facial segments appear stronger.
- Deficiency of the lower third of the face often makes the nose appear strong and overbearing.
- Minor asymmetry does not necessarily detract from facial attractiveness as long as it does not result from any cosmetic procedure.
- What may be unpleasant feature in a female's face may be cosmetically acceptable in a male's face.

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The Ageing Process in Men

2

Berthold Rzany and Frank Bachmann

2.1 The Genetic and Environmental Ageing Process in Men

Ageing is a complicated process comprising genetic (intrinsic) and environmental (extrinsic) factors (Oikarinen 1990; Ma et al. 2001). Intrinsic ageing, also known as chronological ageing, is determined by the genetic background. In contrast, extrinsic ageing is influenced by external factors such as chronic sun exposure or smoking (Lavker 1995; Chung 2001). Genetics of course also influence our resistance to extrinsic factors; for example, the skin photo-type determines the extent of premature ageing through UV exposure (Gilchrest 1992; Nagashima et al. 1999).

2.2 Intrinsic Ageing

Intrinsic ageing is a term used to describe structural, functional, and metabolic changes in the skin, paralleling the ageing and degenerative changes in other body systems (Uitto 1986; Guinot et al. 2002). The process of intrinsic ageing normally starts in the mid-20s, but the signs are typically not visible for decades. Nevertheless, the 40th birthday seems to be a significant turning point, as many of the age-associated signs of intrinsic ageing tend to become prevalent in the fourth and fifth decade of life, marking the transition from young to aged skin (Guinot et al. 2002).

2.2.1 Genetics in Ageing

Our genes highly influence the onset and speed of the normal ageing process (Guinot et al. 2002). In contrast to simpler animals such as nematode worms and fruit flies, we do not have defined longevity genes. However, genetic analysis in mammals did reveal a number of mitochondrial DNA polymorphisms to be associated with longevity (Vijg and van Orsouw 2002; Capri et al. 2006; Salvioli et al. 2006).

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2.2.1.1 The Telomerase Hypothesis

One concept to explain genetic ageing is the telomerase hypothesis (Kosmadaki and Gilchrest 2004; Sugimoto et al. 2006). The proliferation-dependent, continuous shortening of the telomerase (specific structure at the ends of chromosomes) plays a role in setting the internal biological clock. The telomeric length in human tissue was found in vivo to be inversely related to the individual's physical age, as it was shorter in the cells from older persons than in those from younger adults (Harley et al. 1990; Allsopp et al. 1992).

2.2.1.2 Reactive Oxygen Species (ROS)

Harman (2003) suggests that most ageing changes are due to the molecular damages caused by free radicals. Free radicals are either highly reactive atoms or highly reactive molecules because of an unpaired electron. In the presence of oxygen, extremely reactive hydroxyl radicals are formed which can react with macromolecules including DNA and proteins. Reactive oxygen species (ROS) are thought to contribute significantly to the somatic accumulation of mitochondrial DNA mutations (Wei 1998; Wei and Lee 2002; Loeb et al. 2005; Lee and Wei 2007) as mitochondria do not contain any repair mechanism to remove DNA lesions. As a result of this accumulated damage, the aged cells have reduced antioxidant capacity, further exacerbating ROS-mediated damage and intrinsic ageing in human skin (Miquel 1998; Wei 1998; Wei and Lee 2002; Loeb et al. 2005; Lee and Wei 2007).

2.2.2 The Phenotype of Intrinsic Skin

Intrinsically aged skin is characterized by generalized wrinkling, dry and thin appearance, and seborrhoeic keratoses (Gilchrest and Rogers 1993). In contrast to photoageing, sun-protected skin does not develop the leathery, sagging appearance of actinically damaged skin (Dzubow 1991). Intrinsic ageing also means an imbalance of hair growth. The growth of unwanted hair is increased in some areas while in other areas bald patterns become more obvious. The normal turnover of new skin cells decreases slightly and takes 4–6 weeks in aged skin, in contrast to young skin, which renews itself in 3–4 weeks. Dead skin cells of aged skin do not shed as quickly and efficiently. Additionally, the top layers of the skin loose moisture and the oil production along with the protective barrier is diminished, wherefore the skin appears dry and more dehydrated.

2.2.3 Histology of Intrinsically Aged Skin

The histological differences between intrinsically and extrinsically aged skin are dramatic, with the intrinsically aged skin generally demonstrating an overall loss of extracellular matrix, while in photoaged skin, certain proteins such as elastin are increased (Dzubow 1991).

In addition to the general atrophy of the extracellular matrix, with its decreased elastin and decreased thickness in the fibrils of interstitial collagen (Ma et al. 2001), the dermis of intrinsically aged skin displays increased levels of collagen-degrading metalloproteinases, a loss of fibroblasts and vascular network, and in particular, a loss of the capillary loops that occupy the dermal papillae (Kligman and Murphy 1996) (Abb. 2.1).

2.2.3.1 Epidermis

The most consistent change associated with intrinsic ageing is a flattening of the dermal–epidermal junction with loss of the dermal papillae (Lavker 1988; Branchet et al. 1990; El-Domyati et al. 2002). Although cellular polarity and normal epidermal differentiation appear to be maintained (Uitto and Bernstein 1998), a progressive decrease in melanocyte and Langerhans cell density occur.

2.2.3.2 Dermis

Intrinsically aged skin shows a general atrophy of the extracellular matrix, with a reduced elastin content and a decreased thickness in the fibrils of interstitial collagen as well as a disintegration of elastic fibres (Braverman and Fonferko 1982; Ma et al. 2001). The relative amount of elastin in sun-protected skin significantly decreases from the first decade (approximately 49.2%) to the ninth decade (approximately 30.4%; El-Domyati et al. 2002). The decrease in elastic fibers is accompanied by a gradual reduction in the amount of collagen fibers. Throughout adult life, the collagen content of the dermis decreases by approximately 1% per year.

The molecular mechanisms underlying the collagen deficiency during intrinsic ageing result from an increased matrix metalloproteinase (MMP) expression and a concomitant reduction in collagen synthesis (El-Domyati et al. 2002). The levels of MMP-1, 2, 9, and 12 increase with age, while the expression of pro-collagen mRNA is significantly lower in aged skin than in young skin (Varani et al. 2000).

In addition, an age-dependent reduction of cutaneous vessel size can be found in the dermis, but in contrast to photoaged skin the number of dermal vessels is not reduced. Therefore, an inverse relation of vessel number and age seen in sun-damaged skin is not present in sun-protected skin (Chung et al. 2002).

2.3 Extrinsic Ageing

Superimposed on the intrinsic ageing process, extrinsic ageing increases the ageing process (Oikarinen 1990; Antell and Taczanowski 1999). In addition to UV irradiation, smoking and alcohol consumption and various other factors such as cold winds and low temperatures, stress, and lack of sleep may negatively affect the appearance of our skin.

2.3.1 Photoageing

Sun-exposure (ultraviolet radiation, UV irradiation) significantly accelerates and modulates the ageing process of the skin (Leyden 1990; Fisher et al. 1997; Yaar and Gilchrest 1998). The process of UV-induced ageing is also called photoageing. Photoageing, like chronological ageing, is a cumulative process that is superimposed on intrinsic ageing. However, unlike chronological ageing, which depends only on the passage of time, photoageing depends mainly on the degree of sun exposure and skin phototype, which is determined by patient's skin pigment. Based on a person's complexion and responses to sun exposure, the different skin types are classified according to Thomas B. Fitzpatrick (1975) (http://www.skinclinic.us/skintype.html). This classification comprises six different skin types from type 1 (extremely fair skin) to type 6 (very dark skin) (see Appendix). Patients with a type 1 are predisposed to premature ageing, especially when they are living in an environment with a high degree of UV exposure (Fig. 2.1).

Fig. 2.1 Clinical example of premature photoageing in a type 1 patient in his mid-forties. Extensive erythema with telangiectasia with multiple actinic keratoses in the sun exposed areas.

2.3.2 The Pathopysiology of Photoageing

Photoageing of the skin is a complex biologic process affecting various layers of the skin (Ma et al. 2001). Both short wavelength (UVB) and long wavelength (UVA) contribute to photoageing. UVB mainly causes injury to the epidermis (keratinocytes) via induction of DNA damage such as cross-linking of adjacent pyrimidines. UVA causes damage mainly to the dermis (fibroblasts and to keratinocytes in the epidermis as well) through generation of ROS via interaction with intracellular chromophores and photosensitizers (Oikarinen 1990; Hanson and Simon 1998).

In addition, the accumulation of mitochondrial DNA (mtDNA) mutations accompanied by decline of mitochondrial function is a crucial mechanism of normal ageing. The UV-induced mtDNA mutagenesis and consecutive deletion with decrease in mitochondrial function is meditated by singlet oxygen (Berneburg et al. 1999).

2.3.3 The Phenotype of Photoaged Skin

Photoaged skin usually shows a variety of clinical manifestations, including coarseness, wrinkling, sallow discoloration, telangiectasia, irregular pigmentation, and a variety of benign, premalignant, and malignant neoplasms (Gilchrest 1989; Fig. 2.2). The recoil capacity and tensile strength is gradually lost, resulting in wrinkle formations, increased fragility, and impaired wound healing (Oikarinen 1990). While the epidermis gets thinner and eventually blisters, tears, and grazes more easily, the dermis thickens with yellow thickened bumps due to tangled masses of damaged elastin protein (elastosis or heliosis). However, the thick dermis loses elasticity and is weaker than normal.

Some authors clinically distinguish between two distinct types of photoaged skin: the type of Milian's citrine skin and the atrophic, telangiectatic phenotype. The first phenotype is characterized by deep wrinkles, laxity, a leathery appearance, increased fragility, blister formation, and impaired wound healing. On the back of the neck, furrows are arranged in a typical rhomboidal pattern called cutis rhomboidalis nuchae. Weakened stromal support of the walls of the follicular unit is supposed to be the underlying mechanism. The atrophic variant of photoaged skin reveals marked telangiectasia. The degree of wrinkle formation is rather limited. However, the increase in wrinkle formation in sun-exposed areas of the face and neck is still visible compared with that in sun-protected areas.

2.3.4 The Histology of Photoaged Skin

At the histological level, photoaged skin is characterized by a loss of mature dermal collagen leading to a distinct basophilic appearance ("basophilic degeneration"). There is an increase in the deposition of glycosaminoglycans and dystrophic elastotic material in the deep dermis (Mitchell 1967; Werth et al. 1996) (Fig. 2.3a, b).

Fig. 2.2 Clinical example of photoageing in a type 3 patient in his mid forties with thin, freckled skin and one large lentigo simplex on the right cheek.

2.3.4.1 Epidermis

Although the stratum corneum of the epidermis is usually unchanged, it presents itself with hyperkeratosis. The epidermis may be hypertrophic or even unaltered, but quite often it is hypotrophic with an increased number of melanocytes (Scharffetter-Kochanek et al. 2000). These melanocytes are characterized with an irregular distribution along the basal membrane, and differ extensively in size, dendricity, and pigmentation (Breathnach and Wyllie 1964; Gilchrest et al. 1979).

2.3.4.2 Dermis

The most prominent histological feature of photoageing is dermal elastosis in the upper dermis (Gilchrest and Rogers 1993; Bosset et al. 2003). Elastosis largely consists of thickened, tangled, and ultimately granular amorphous elastic structures (Braverman and Fonferko 1982; Montagna et al. 1989; Taylor et al. 1990); it generally begins at the junction of the papillary and reticular dermis (Kligman 1969) and presents as a large increase in the

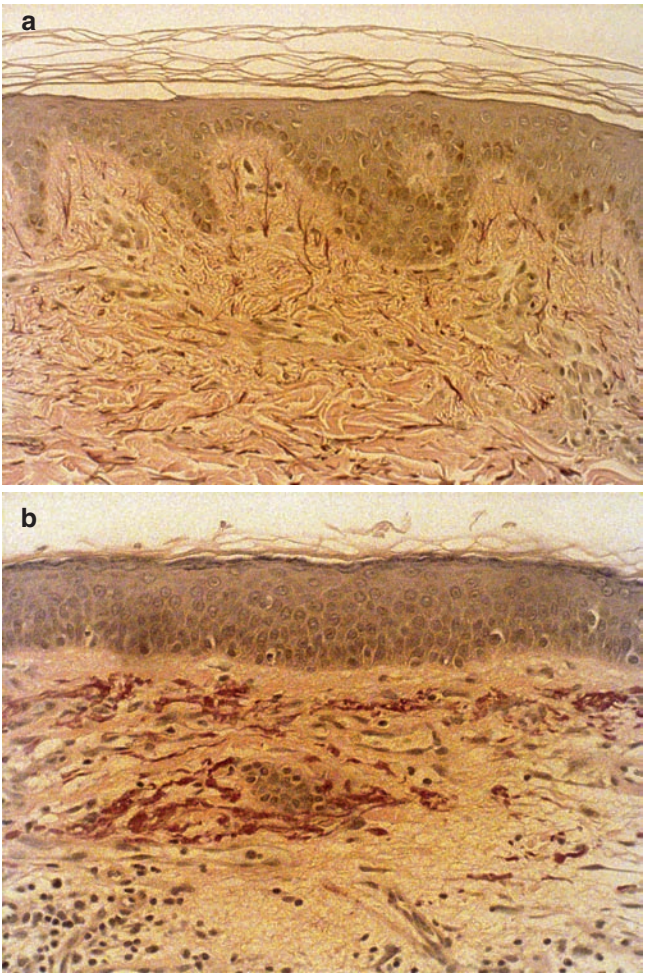

Fig. 2.3 (**a**) Young skin: In the papillary dermis, elastic fibers are thin and perpendicular to the dermo-epidermal junction. In the reticular dermis, the elastic fibers are thicker and are oriented parallel to the papillary dermis. Elastic fibers (*black bundles*) were visualized by Elastica-van Gieson stain (1 × 100). (**b**) Old skin: Irregular fragmentation and disintegration of elastic fibers in the reticulary dermis. Decrease and disappearance of elastic fibers in the papillary dermis was observed. Elastic fibers (*black bundles*) were visualized by Elastica-van Gieson stain (1 × 100) (Courtesy Dr. H.J. Roewert).

deposition of glycosaminoglycans and fragmented elastic fibers (Mitchell 1967; Chen et al. 1986; Scharffetter-Kochanek et al. 2000), as well as dermal extracellular matrix proteins such as elastin (Smith et al. 1962; Braverman and Fonferko 1982; Uitto 1986), glycosaminoglycans (Sams and Smith 1961; Smith et al. 1962), and interstitial collagen (Trautinger

et al. 1989; Lever 1990; van der Rest and Garrone 1991). Mature collagen fibers are replaced by a collagen with a distinct basophilic appearance. This is called basophilic degeneration.

2.3.5 Other Factors Affecting Extrinsic Ageing

Beside sun exposure, other external factors prematurely age the skin and accelerate the normal skin ageing process.

2.3.5.1 Smoking

Facial wrinkling is significantly more common in cigarette smokers and in current smokers, with the relative risk of moderate-to-severe wrinkling of 2.3 for men (Ernster et al. 1995). In men, about 20 years of smoking 40 cigarettes a day is perceived as ageing 1 year (Rexbye et al. 2006). Heavy cigarette smokers (greater than 50 pack-years) are 4.7 times more likely to have facial wrinkles than nonsmokers, independent of sun exposure (Kadunce et al. 1991; Ernster et al. 1995). For current smokers, the relative risk of moderate-to-severe wrinkling appears to increase after 11 pack-years of smoking (Kadunce et al. 1991), and the degree of facial wrinkling is higher compared with that of nonsmokers and past smokers (Koh et al. 2002).

According to the findings of Leung et al. (Leung and Harvey 2002), smoking 30 cigarettes a day could lead to the equivalence of about 14 years of skin ageing by the age of 70 years, while effect of sun exposure for 5 h a day for 30 years produces the equivalent of only 1.5 years of skin ageing. Therefore, cigarette smoking alone seems to be a strong predictor of skin ageing. The effect of smoking on facial wrinkling, however, does not appear to become evident until middle age (Ernster et al. 1995). Then smoking might lead to a certain phenotype of pale, grayish, and wrinkled atrophic skin (Smith and Fenske 1996).

What are the reasons for that? Tobacco smoke like UV-exposure induces an increased expression of MMPs, which are directly involved in the collagen breakdown. Furthermore, direct phototoxic effects of the tobacco smoke are discussed. In addition, smoking decreases the water content of the stratum corneum, which may account for the dry skin appearance of smokers.

2.3.5.2 Smoking and Sun Exposure

The combination of smoking and sun exposure has (see above) a synergistic effect on skin ageing. The induction of MMP-1 by smoking may explain these multiplicative effects of sunlight and smoking (Kadunce et al. 1991; Lopez Hernandez 1995; Yin et al. 2001; Gross et al. 2003).

2.3.5.3 BMI

The body mass index (BMI) affects external ageing and is reversely related to the degree of wrinkling. Therefore, a higher BMI as well as a better health negatively correlate with premature ageing, whereas illness is often associated with the loss of weight (Purba et al. 2001) and may lead to an increase in perceived age. For example, a decrease of two units in the BMI in men has the same effect as ageing 1 year. A high BMI makes men look younger (Rexbye et al. 2006).

2.3.5.4 Alcohol

The frequent intake of alcoholic beverages contributes to premature ageing of the skin. Therefore, the perceived age is greater than chronological age in these individuals (Sherertz and Hess 1993).

2.3.5.5 Social Class

The social class appears to have a great impact on the perceived age as well, as a shift in one's social class from highest to lowest compares to 3.5–4 years difference in chronological age (Rexbye et al. 2006).

2.3.5.6 Diseases

Certain diseases are associated with a higher perceived age. For men, asthma or chronic bronchitis as well as stroke negatively contribute to the perceived age. Often smoking is the underlying cause (Rexbye et al. 2006). In addition, depression has a major impact as well. For example, a change in the depression symptomatology score from 17 to 49 is same as ageing 2.4 years for men (Rexbye et al. 2006).

2.3.5.7 Marriage

Marriage, too, tends to decrease the perceived age. However, the effect is more obvious in women than in men. Being married compared with never being married equals to a 1-year decrease in perceived age for men and 1.9 years for women (Rexbye et al. 2006).

2.4 Classification of Ageing and Wrinkles

2.4.1 Classification of Ageing

There is so far no scale specifically designed for male ageing. The most used scale is probably the Glogau's classification of photoageing. It ranges from "mild" (few wrinkles that require no or little make-up for coverage) to "severe" (severe wrinkling, photoageing, and precancerous or cancerous lesions). The Glogau's classification is primarily used to assess ageing in female patients. Some parts of the definitions as the use of make up are not helpful in men (see "Glogau's Classification" in Appendix). We therefore propose a male ageing scale modified from the Glogau scale (Table 2.1)

2.4.2 Classification of Wrinkles and Volume Loss

Concerning the measurement of wrinkles and volume loss, the evidence is much better as these scales were needed as outcome parameters in clinical trials. The scales range from three, four to five point scales (www.dermnetz.org; Honeck et al. 2003) (see "Fitzpatrick Classification of Facial Lines" in Appendix).

In 2008, an attempt was made to establish validated scales for volume loss as well as wrinkles based on computer generated photographies (Carruthers et al. 2008; Carruthers et al. 2008; Carruthers et al. 2008; Carruthers et al. 2008). These scales may be used as outcome criteria in clinical trials; however, they may be also useful when monitoring patients' individual treatment progress in clinical practice.

2.5 Prevention of Ageing

2.5.1 Avoidance of Excessive Sun Exposure

Prevention of the ageing process should be the first step. Luckily two of the major factors are accessible to prevention: UV exposure and smoking. Protecting the skin from the sun and preventing sun damage can significantly slow down premature skin ageing (Seite et al. 2000; Elsner et al. 2005; Grether-Beck et al. 2005). Staying out of sun between 10:00 a.m. and 4:00 p.m. (when the sun's radiation is strongest) as well as avoiding deliberate tanning especially including the use of indoor tanning devices such as sun beds, wearing protective clothes with a UV Protection Factor (UPF) of 15 or higher (www.dermnetnz.org), applying sunscreen with a Sun Protection Factor (SPF) of 15 or higher, and using sunglasses that block UVA as well as UVB rays are a comprehensive sun protection to prevent premature

Table 2.1 The male ageing scale

	Description			
Classification	**Wrinkles**	**Volume loss**	**Sagging**	**Photoageing (optional)**
None (Grade 1) (Fig. 2.4a, b)	Few wrinkles, if any	No volume loss	No sagging	No signs of photoageing
Mild (Grade 2) (Fig. 2.5a, b)	Early mimic wrinkling	Mild volume loss	Mild sagging	Initial signs of photoageing
Moderate (Grade 3) (Fig. 2.6a, b)	Moderate wrinkling	Moderate volume loss	Moderate sagging	Persistent signs of photoageing
Severe (Grade 4) (Fig. 2.7a, b)	Severe wrinkling and fold	Severe volume loss	Severe sagging	Severe signs of photoageing, including actinic keratosis and/or skin cancer
Extreme (Grade 5) (Fig. 2.8a, b)	Very severe wrinkling and folds	Very severe volume loss	Very severe sagging	Very severe signs of photoageing, including actinic keratosis and/or skin cancer

Please note that the signs of photoageing are optional

Fig. 2.4 (**a**) and (**b**) Patient in his 20s with Grade 1 on the male ageing scale.

Fig. 2.5 (**a**) and (**b**) Patient in his 30s with Grade 2 on the male ageing scale.

Fig. 2.6 (**a**) and (**b**) Patient in his 40s with Grade 3 on the male ageing scale.

Fig. 2.7 (**a**) and (**b**) Patient in his 50s with Grade 4 on the male ageing scale.

Fig. 2.8 (**a**) and (**b**) Patient in his 70s with Grade 5 on the male ageing scale.

ageing caused by the sun. Therefore, the dermatologists should educate their patients on how to use and to choose a good sunscreen product with high SPF-broad spectrum with UVA and UVB absorbers, water resistance, and advanced photostability (Leverkus 2004). Sunscreens should be used on a daily base since repeated mini exposures to UV radiation account for 80% of the total exposure over a lifetime (Schaefer et al. 2000). Nevertheless, sunscreens should not be abused in an attempt to increase time in the sun to a maximum. And always keep in mind: "There is no such thing as a healthy tan".

2.5.2 Avoidance of Smoking

Patients who do not want to age premature should refrain from smoking as well. Smoking cessation should be encouraged in patients seeking aesthetic procedures. Smoking does not only accelerate the ageing process of the skin but also slows down wound healing as well.

2.5.3 Topical Substances

Although a variety of substances are postulated to have antiageing properties, one has to be aware that for most products (except topical retinoids) good clinical studies are missing. Therefore, any recommendation should be given with caution.

2.5.3.1 Topical Retinoids

Topical retinoids are the only products where we do have some evidence that they prevent skin ageing. Currently available are e.g. retinol, retinaldehyde, retinoic acid, adapalene and tazarotene. The latter ones are so far not routinely used to prevent skin ageing.

2.5.3.2 Antioxidants and Other Substances

There are nearly no topical antiageing cosmetic products or cosmeceuticals that do not contain antioxidants such as vitamin C (ascorbic acid), E (tocopherols), as well as β-carotene and bioflavonoids. These substances act as oxygen scavenger, and therefore, possibly counterpart the increased ROS generation in the sun-exposed skin, as has been shown in in vitro models of UV damage for some of these substances (Yaar and Gilchrest 2001). There is no data on the longtime effectiveness of these substances. However, one has clearly to state that if they work they are more likely to work in the topical form. Because of the physiological processes including absorption, transport, and metabolism, an oral supplementation for the augmentation of the skin's antioxidant levels is ineffective.

Eicosapentaenoic acid (EPA) (an Omega 3 fatty acid) is another substance used in preventing skin ageing. The topical application of EPA inhibits UV-induced collagen decrease and attenuates MMP-1 and MMP-9 expression following UV irradiation. These effects of EPA are mediated by inhibiting UV-induced JNK and p38 activation as well as COX-2 expression. Moreover, topical application of EPA to aged human skin induces ECM expression by increasing TGF-b expression. Therefore, topical application of EPA is another substance thought to counteract intrinsic as well as extrinsic skin ageing.

2.5.3.3 Topical Moisterizers and Keratolytic Agents

Moisturizers and keratolytic agents are commonly used to prevent premature ageing. Moisturizers decelerate the loss of humidity from the surface of the skin by the deposition of an oil film, avoiding evaporation on the surface to the environment and, therefore, the continuous loss of water content of the stratum corneum. Moisturizers thereby help to prevent xerosis and to minimize the aspect of fine wrinkles and to maintain appropriate level of skin humidity. Keratolytic agents help to prevent the accumulation of excessive stratum corneum and to remove the cohesive attachment of the cornified cells commonly present in xerosis.

2.5.4 Too Many or Less Calories

What else can you do? There are no good data on other factors. On the basis of the above overview, a slightly increased BMI seems to be helpful to look better.

Caloric restriction in contrast may increase longevity. Caloric restriction is the significant reduction in caloric intake without essential nutrient deprivation. The restriction of food intake delays and slows the progression of a variety of age-associated diseases, and maintains many physiological processes in a youthful state to a very advanced age. Although the mechanism of this effect is poorly understood, caloric restriction is presumed to act by reducing the oxidative damage that occurs secondary to ROS generation by the cellular metabolism.There is only one disadvantage: thinner patients might look older!

Do's

- If you are fair skinned, you should start very early to regularly apply sunscreens and wear sun protective clothing.
- Although the evidence is not very good, it does not harm applying topical antiagent products containing Vitamin A, Vitamin C, or other antioxidants.

Don'ts

- Do not rely on oral antioxidants and other dietary supplements. There is no proof that they really work. It is much better to avoid the known risk factors for premature ageing.
- Patients should not worship the sun and/or cigarettes too much. Otherwise premature ageing is inevitable.

Key pointers

- Ageing is a complex process that we still do not understand well enough. Basically, intrinsic and extrinsic ageing can be distinguished. Extrinsic ageing is preventable. However, we need to be strong enough to refrain from life style hazards such as sun.

FAQs

Should I recommend cosmetics and cosmeceuticals to men?
Men did come a long way to accept rejuvenation. However, they are not so far ready to appreciate the need for a full cabinet of cosmetics and cosmeceuticals. This may change as some companies (e.g., Vichy Laboratoires) are developing specifically designed cosmetics or cosmeceuticals for men. Concerning the answer, you should decide on a case-to-case base if you recommend cosmetics or cosmeceuticals. They might be used as an adjunctive in patients asking for BoNT-A or filler treatment.

Should somebody be treated who continues smoking?
Some colleagues refuse to treat patients when they continue with their bad habits. This is a tough question. However, we are not the chaperons of our patients. Nevertheless, we should always point out that bad habits will make it much more difficult to treat the patient and maintain a reasonable good effect over time.

Why may clinical scales in my daily practice be helpful?
If you do not photograph your patient each time he visits the office, the documentation of the severity of skin ageing, folds, or volume loss by a clinical scale might be helpful to

follow the progress of the patient. In addition they come handy, if you apply some measures of quality management in your office.

Appendix

Fitzpatrick Skin Types

Type I: Very fair/pale white skin that always burns and never tans (blue/hazel eyes and blond/red hair).
Type II: Fair skin that always/easily burns and poorly/sometimes tans (blue eyes).
Type III: Medium/darker white skin that initially/sometimes burns and always tans.
Type IV: Olive/light brown skin that minimally burns and always tans.
Type V: Brown skin that rarely burns and always tans.
Type VI: Dark brown or black skin that never burns and always tans.

http://www.skinclinic.us/skintype.html

Glogau's Classification

- *Mild*: few wrinkles, no keratoses, requires little or no make-up for coverage
- *Moderate*: early wrinkling, sallow complexion with early actinic keratoses, requires little make-up
- *Advanced*: persistent wrinkling, skin discoloration with broken blood vessels (telangiectases) and actinic keratoses, often/always make-up required
- *Severe*: severe wrinkling and furrows, photoageing, gravitational and dynamic forces affecting skin, actinic keratoses with or without skin cancer, requires make-up but with poor coverage

Fitzpatrick Classification of Facial Lines

- *Class I*: fine lines
- *Class II*: fine-to-moderate deep wrinkles and moderate number of lines
- *Class III*: fine-to-deep wrinkles, numerous lines, and possibly redundant folds

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Patient Selection

3

Maurico de Maio

3.1 Introduction

Cosmetic procedures have become a regular and popular topic of everyday conversation as society has become more open about the subject and its merits. The benefits to male patients who undergo aesthetic surgical and nonsurgical procedures cannot be refuted anymore. To a certain extent, cosmetic procedures have for some become a normal and a necessary part of life. Because of longer social and professional life expectancy, a youthful and refreshed appearance has become a wish for male patients, both for surgical and nonsurgical procedures. Men wish to rejuvenate for business reasons. Why to leave eye bags and double chin if we can get rid of them with minimal invasive surgical procedures?

Patients seeking improvement in facial appearance are younger than ever. They want improvement in the signs of facial ageing, but they have other expectations, as well. They want a natural look (not overworked), no evidence of surgery (e.g., no obvious scars), less invasive approaches, less downtime from their procedure, ambulatory office-based procedures, multiple small interventions rather than one more involved procedure, less sedation, rapid recovery, and few and minor complications. Many are not seeking extensive surgery, but rather a more focused, limited treatment plan. In addition, they fear the surgery and the use of general anaesthesia and are concerned about the cost of the procedure (Zide 2003). Given the choice, male patients will opt for a less invasive procedure with more rapid recovery, especially if there is little or no difference in objective outcome (Brackup 2003). The development of no-downtime, nonsurgical, office-based procedures have stimulated fresh interest among men who are unwilling to tolerate invasive surgical procedures because of the inherent postoperative morbidity and downtime.

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3.2 The Male Cosmetic Business

3.2.1 The US-Experience

Male cosmetic surgery procedures comprise approximately 10–20% of cosmetic revenue available nowadays. Ten years ago, 56% of American women and 43% of American men report dissatisfaction with their overall appearance (Garner 1997). This epidemic of dissatisfaction motivated many behaviors and tendencies seen today, such as weight loss, exercise, cosmetic use, and surgical and nonsurgical cosmetic procedures. Beauty magazines often say that about 30% of men are spending more money than women in beauty products!

From 2000 to 2004, there was a general decrease in surgical but increase in nonsurgical facial enhancement procedures in males. The number of surgical procedures has been declining as a result of greater utilization of noninvasive alternatives. Despite a downward trend in aesthetic facial surgery procedures, there was a significant and rising trend of patients undergoing multiple surgeries. Certain surgical procedures have declined as other more modern techniques begin to take hold, for example, decrease in cheek augmentation procedures as more physicians perform midface lifts or increase the use of filler materials, or both. Men have seen sharper decreases in several procedures, including cheek implants, rhinoplasty, and surgical lip enhancement. A slight downward trend was seen for laser skin resurfacing. There was an upward trend for male seeking hair restoration procedures and botulinum toxin cosmetic treatments, and downward trends for eyelid surgery. The top five surgical procedures for men from 2000 to 2004 included hair transplantation, rhinoplasty, eyelid surgery, scar revision, and facelift (AAFPRS 2005).

During the 2004–2005 period, there was a 22% increase in cosmetic procedures among men, and 200% increase in botulinum toxin and filler use (ASAPS 2007). According to the American Association of Aesthetic Plastic Surgery, fillers are the second most popular minimally invasive procedure among men after botulinum toxin (Holcomb and Gentile 2005a).

In 2006, men represented 9% of cosmetic procedures. The number of procedures including both surgical and nonsurgical, performed on men was just over one million, an increase of 17% from 2005. Surgical procedures increased by 5% and nonsurgical procedures increased by 21%. Since 1997, surgical procedures have increased by 3% while nonsurgical procedures have increased by 886%. The top five surgical procedures for men included liposuction, eyelid surgery, rhinoplasty, breast reduction to treat enlarged male breasts, and hair transplantation. The top five nonsurgical procedures included botulinum toxin injection, laser hair removal, microdermabrasion, hyaluronic acid injections, and IP laser treatment. Male patients from 35 to 50 years old represented 47% of all cosmetic procedures and from 51 to 64 years old more 25% (ASAPS). Chemical peels, nose reshaping, hair removal, microdermabrasion, botulinum toxin, fillers, liposuction, eyelid surgery, hair transplantation, and breast reduction round out the top ten procedures for males in 2004 (ASAPS).

In 2007, the annual member survey, conducted by the American Academy of Facial Plastic and Reconstructive Surgery, unveiled a 27% increase in surgical and nonsurgical activity among men and women since 2000. Men account for 30% of the increase while women take credit for 26%. With people staying in the workforce longer, this year's survey revealed that

both men and women requested cosmetic surgery to remain competitive in the workplace (66% and 65%, respectively). More than half of patients (53%) have had multiple procedures in the same year. Most of the patients having multiple procedures in the same year are women (82%) vs. men (18%). The tendency of male patients to undergo cosmetic procedures continued strong in 2007. The most common nonsurgical procedures included botulinum toxin, hyaluronic acid injections, chemical peels, and microdermabrasion. The most frequent surgical procedures were rhinoplasty, facelifts, hair transplants, blepharoplasty, and scar revision.

3.2.2 Ethnic Differences

Once the secret of the elite, cosmetic surgery has now filtered down to the masses. For many minorities, cosmetic surgery is no longer viewed as a sign of self-hatred or a rejection of racial identity. It is about enhancing natural beauty. From 2000, there was an increase in African American (40%), Hispanic (19%), and Caucasian (7%) cosmetic surgical patients. The proportion of Asian American cosmetic surgical patients is slightly less since 2000 (negative 8%). There has been little change among Caucasian and African American cosmetic surgical patients from 2006 to 2007. Considering four popular cosmetic surgery procedures, AAFPRS members reported that African Americans are most likely to undergo rhinoplasty or nose job surgery (63%) as are Hispanics (45%). Asian Americans are most likely receiving blepharoplasty or eyelid surgery (39%), while Caucasians are more evenly split between rhinoplasty (27%), blepharoplasty (24%), and face lifts (26%).

3.3 Adolescents and Cosmetic Procedures

Cosmetic procedures on adolescents are a reality today. The number of teenagers having cosmetic surgery has doubled recently, because of the fact that increased self-consciousness and dissatisfaction about physical appearance are characteristics for the adolescent age period (Rauste-von Wright 1989). Impediments in psychosocial functioning are the primary motivation for plastic surgery in children, adolescents, and adults. It is to be contrasted therefore the limitations and risks of certain procedures in adolescents (Harris 1982). The question whether their rapid physical and psychological development would interfere with the outcome is one of the aspects that should be taken into account before any treatment. When adolescent patients seeking cosmetic procedures are compared with adolescents from the general population, there are no overall behavioral and emotional problems, but significant and specific problems related mainly to their appearance. There are minimal differences in correlation between patients and the general population in relation to bodily attitudes, well-being, and personality.

The vast majority of adolescents get information about cosmetic procedures on teen magazines and television and very few rely on family physician or parents. So, the best means of educating adolescents seems to be through the media. According to researches, the motivation that adolescents had for choosing cosmetic procedures was to feel better about themselves. Breast augmentation and liposuction became the two more prevalent

procedures (Thompson and Smolak 2001). Motivation for liposuction meant that they felt to be unattractive (Pearl 2003). It is suggested that if boys apply for plastic surgery, they have sufficient reason to do so and do not constitute a high-risk group for post-treatment psychological problems.

Adolescent patients encounter a large range of appearance-related problems, such as being teased, feeling inferior and rejected, and depressed. In terms of low bodily satisfaction and attitudes, they are especially related to low self-perceived, appearance related competence, poor mental health, and lower extraversion and high neuroticism. Bodily dissatisfaction and negative attitudes are more typical of an introvert personality, so when the physician interviews an introvert patient, more effort should be put to get an appropriate insight in his bodily attitudes.

Dissatisfaction about the overall appearance is higher in adolescents who undergo corrective procedures (acne scars, prominent ears) than in those who are subjected to any reconstructive surgery (congenital deformities, benign tumors). Reconstructive patients show little or no psychosocial problems and are usually satisfied about their appearance (Pertschuk and Whitaker 1988). Body image dissatisfaction in adolescent patients may lead to psychological problems mainly in patients with neurotic personality characteristics. Boys tend to show more of those characteristics that may cause problems after plastic surgery than girls do (Bradbury et al. 1992).

Key pointers

- When compared to older individuals, adolescents seem to have a slightly more negative view on cosmetic surgery.
- When analyzing body status, even being both of appropriate weight and attractive, girls more often found themselves fat while boys viewed themselves too thin.
- It is suggested that if boys apply for plastic surgery, they have sufficient reason to do so and do not constitute a high-risk group for post-treatment psychological problems.
- In neurotic diagnosed personalities, boys may show more evident characteristics that may cause problems after surgical procedures than girls do.

FAQs

Do adolescents seeking for corrective cosmetic procedures present higher psychosocial problems than the general population?
No.

3.4 The Male Adult

The reasons why male patients seek aesthetic enhancement include the desire to improve self-image, look and feel better, look younger, and dislike of a specific feature. Male patients stress that to look less tired and to improve appearance to work-related reasons, maintaining competitiveness is what motivates them mostly. There is an argument that an

older looking person is less up-to-date and efficient. In addition, relationships played a significant role with reasons for cosmetic surgery, including younger spouse, divorce, dating, remarriage, and single status.

In general, male adults may have more anxiety in discussing their appearance than do women. Male patients should be given the opportunity to articulate their specific appearance concerns in detail. They should be asked for how long they have been concerned about the problem and for how long they have been contemplating for a cosmetic procedure.

It is not uncommon for men to make an appointment at the request of spouse or partner and bring a list of topics to be discussed during the consultation. Many men are somewhat embarrassed about their cosmetic concerns and almost apologize for their visit. After some well-timed ice-breaking conversation, they will usually be interested in their cosmetic concern. Usually, they have a clear idea of what they dislike about and what improvement they are looking for. Some men are very focused and articulate and present a clear idea of their goals. In the cosmetic consultation, the most common concern of male patients include forehead wrinkles, crow's feet, telangiectasia, lentigines, acne scars, jowls, laxity of neck and brow, and poikilodermia. In some situations, they may need much guidance to help them identify what should be treated, though. Particularly for wrinkles, jowls, and skin-tightening issues, the questioning is oftentimes ambiguous and the physician plays an important role in making the issue clear for the patient.

Although male patients may seem initially not so worried about the outcome, after the surgery, they will notice and may point out any detail such as tiny asymmetries, etc. Even though minor asymmetry does not necessarily detract from facial attractiveness, many patients are unaware of this condition preoperatively. As some male patients may scrutinize their eyes with the utmost of care postoperatively, they must be informed of and document asymmetry photographically, unequivocally stressing that some asymmetry may persist postoperatively. As very few men have peers who undergo cosmetic surgical and nonsurgical procedures, they may have unrealistic expectations with regard to results and recovery period. Significant time should be spent to explain the procedures, the results, and the postoperative course.

The initial consultation is very important to identify the type of patient we have before us. Extreme anxious and depressive patients are easy to identify, while the borderline or psychosocial personality are more difficult to diagnosis. Studies show that some adult plastic surgery patients undergoing either cosmetic or reconstructive operations tend to exaggerate their deformity (Napoleon 1993). Male plastic surgery patients show that dissatisfaction was more directly related to the area they were considering to treat than to overall body dissatisfaction (Pertschuk et al. 1998).

3.5 Men or Women?

Male patients are often quite demanding with respect to expectations and service, but are most loyal patients, usually coming back without fail, what is absolutely not common among women. In general, male patients are less price conscious and the rate of conversion for procedure is much higher in men vs. women and maybe it is due to the fact that only the very motivated male

patients reach the office. Men frequently believe their concerns are vain and unimportant what makes a slight less direct approach to work best with men when talking about cosmetic indications. However, male patients tend to feel more inclined to upgrade treatments to newer options and tend to come to a decision on larger procedures earlier than women.

When compared with women, male patients present different motivation for cosmetic procedures. Men typically are not acquainted with beautifying tendencies as women are. Men do not need to look pretty; they wish to look fresher mainly for professional reasons. Men in our society do not change their facial appearance or hairstyles as often as women do. Hairstyles tend to be more conservative and consistent. And it must be assumed that male patients accept radical changes poorly. Differently from women, men are generally less price-sensitive and more focused on their cosmetic target. Owing to the difficulty of scheduling multiple sessions, men prefer single treatments with long-lasting benefits.

Differences on the skin and lifestyle may interfere with the formal indications for cosmetic treatments. Men tend to have more actinic damage and more severe facial lines and creases than does women have for occupational and lifestyle reasons. Many men are chronically suntanned, and much less inclined to apply sunscreen. It is a difficult situation for laser treatments, for example. The incidence and severity of acne scarring is also greater in men than in women. Interestingly, male patients tend to be more concerned with laxity in the cheek and neck, and deep nasolabial folds, while women tend to focus not only on the lower face, but also on the forehead and eyes. For cosmetic procedures, males experience pain and anxiety somewhat more differently than do women, and are usually not as tolerant of pain, healing, or time issues as some women are. They are even more concerned to have bruises or any evidence of any cosmetic treatment. Men do not have the means to camouflage the signs of surgeries effectively as women do. Men are less willing to report back to work if they have significant swelling or erythema after a cosmetic procedure, particularly if in a position where frequent social interactions are required. It seems obvious that less risky, less painful procedures with less down time have greater appeal with everybody, especially to men. The idea of having surgery may be more stressful for some male patients, and maybe this is one of the most important reasons why men usually consider facial rejuvenation procedures at an older age than do women.

Men seem not to be as vain as women as long as they are not observed flexing and posing in front of mirrors in gym centres.

3.6 The Metrosexual Man and the Adonis Complex

The history of body modification through the discursive strategy of racialization cannot be forgotten. This means that people, throughout history and throughout the world, have modified their bodies to “pass,” to signify that they belong to their era’s prevailing social group. This is one of the reasons why some male patients may look for cosmetic procedures to soften extreme or overly masculinized appearance, which will lead to more attractiveness. Despite that, if we assume that the average male wants to have “masculine” appearance, care should be taken not to feminize the patient’s face. Nose reshaping resulting in small nose and brows too arched are inadequate for a masculine look, anyway.

The term “metrosexual” may be defined as a straight, sensitive, well-educated man who gives a lot of importance to his appearance. Fashion clothes and jewellery is one of the fundamental the shopping habits. Weekly appointments for manicure and hair cared by a hair stylist and not by a barber are quite common. Creams, moisturizers, and grooming products are a part of daily rituals. The vast majority of male patients do not belong to this group. They are interested in subtle and natural-looking enhancements.

The Greek god Adonis, whose body represented an exquisite standard of masculinity, named the Adonis complex, which includes a collection of male body image problems that can include compulsive weightlifting and exercising, steroid abuse, eating disorders, and full-blown body dysmorphic disorder. This problem is created by biological and psychological forces that combine with modern society’s and the media’s powerful and unrealistic messages emphasizing an ever-more muscular, ever-more fit, and often unattainable male body ideal. A world of steroid abusers and compulsive runners, anorectics and bulimics, men who are losing their hair and potency, and patients getting facelifts, buttock lifts, and silicone implants – all in pursuit of youth, sex appeal, and success – premised on the notion that modern men have fallen into the beauty trap so long assumed to be the special burden of women. It is said that the male preoccupation with hair, physical fitness, cosmetic surgery, and sexual dysfunction began after World War II. This man will risk his actual health for the appearance of health, which nowadays means the appearance of youth.

3.7 Western vs. Non-Western Men

Some studies have shown that young Western men display unrealistic body ideals. Western advertisement seems to place an increasing value on the male body and that may lead to more dissatisfaction with their bodies than does non-western men. In Western magazines, undressed men are portrayed frequently while undressed Asian men are rarely shown that way. It may lead to the conclusion that Western societies are much more preoccupied with body image than in non-Western countries. This difference may reflect that Western traditions emphasize muscularity and fitness as a measure of masculinity. Increasing exposure of Western men to muscular male bodies in media image does play an important role on the body as a measure of masculinity. These factors may explain why body dysmorphic disorder and anabolic steroid abuse are more serious in western males (Yang et al. 2005).

3.8 Men and Hair Loss

Men react in a variety of ways when they begin to lose their hair. It is important to understand the psychology behind this matter for proper patient selection. Many men think that the loss of hair equals the loss of youth, which means inevitabe ageing and eventual death. There are many reactions to hair loss. Denial plays a large part in reactions and emotions some men feel about their hair loss, so denial becomes the most important part to recognize and cope with. The sign of thinning the hair may lead to fear and to some, desperation.

Worry about how attractive they may look to women, whether they will get a job promotion, or if they will be accepted in social environments are some of the points that come to their mind in that phase. Men often complain that they become a sort of jokes to friends, and their wives/girlfriends "selected" them when they were not bald and that leads to a lot of stress. So, hair loss makes many men go to impulse behavior to spend thousands on special creams, tonics, and sprays. Some other men may inclusively become obsessed and start spending hours and hours in front of mirror studying the progress of hair loss, and getting frustrated to see the mass of hair lost in the shower. Much time is also spent to cover up the hair loss. A bitter angry personality may come up and jealousy may result of other men around with the known question: Why me?

Isolation is another feeling that is common among men with hair loss, even though there are thousands and thousands who experience that. Society is probably the number one factor in why men feel ashamed of their hair loss. The media tends to include young, strong men with flowing hair in any campaign. Balding equals ageing and society equates beauty and youth with success. So, by losing their hair, some men may feel that they do not fit the society any longer.

3.9 Male Satisfaction with Cosmetic Procedures

Patient satisfaction with cosmetic procedures is one of the most important aspects for cosmetic practitioners. It has been assumed that a positive change in physical appearance for the patient will lead to an improvement in their psychological well being, including self-confidence and self-esteem (Grossbart and Sarwer 1999). The most important contributors to the analysis of body satisfaction include the self-perceived competence (physical appearance), psychosocial functioning (internalizing and externalizing problems, depression, social anxiety), and personality (extraversion, neuroticism). Self-competence concerning physical appearance, global self-worth, depression, behavioral and emotional problems, and extravert and neurotic personality may be correlated moderately to highly with bodily satisfaction and bodily attitudes, indicating that experienced competence and well-being are related to subjective perception of appearance.

Most male patients seeking cosmetic procedures appear to be psychologically healthy. Presumably, a large proportion of patients who undergo cosmetic procedures and were pleased with the result would be considered to have had "problems" of minimal proportions (Edgerton et al. 1960). Patients can be satisfied with their appearance change following cosmetic procedures, but may experience no change in psychological characteristics. And that, for some individuals, cosmetic procedures may have a negative outcome.

Problems both for patients and for cosmetic practitioners may come up after negative outcomes. Problems encountered by the patient include depressions and adjustment problems, social isolation, familial dysfunction, self-destructive behaviors, and anger towards the practitioner and staff (Goin and Rees 1991). For the practitioners, the problems include distress, harassment for further procedures, complaint, and legal action (Wengle 1986).

One should be most concerned about people who have had numerous procedures by many practitioners, most or all of which the patient has considered unsatisfactory.

3.10 Body Dysmorphic Disorder

It is clear that some individuals are not satisfied even with objectively acceptable outcomes. For such individuals, the focus of their concern may shift to some other body part after the cosmetic procedure or they may be chronically dissatisfied with the cosmetic result (Veale et al. 1996). Some of these dissatisfied patients seek further interventions, often with increased distress both for them and for the practitioner. The vast majority of these individuals may suffer from body dysmorphic disorder (BDD), which is a recognized psychiatric disorder that consists of distressing and/or impairing preoccupation with a nonexistent or slight defect in appearance. Treatments on this population may exacerbate or promote no change in the symptoms (Veale 2000). There are men who are dysmorphic body builders who would not go outside for the fear that he looks too small. The muscle dysmorphia is best understood as a form of obsessive-compulsive disorder.

The American Psychiatric Association (APA 1994) defines BDD as

- Preoccupation with an imagined defect in appearance. If a slight physical anomaly is present, the person's concern is markedly excessive.
- The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- The preoccupation is not better accounted for by another mental disorder (e.g., dissatisfaction with body shape and size in anorexia nervosa).

Key pointers

- Some specialists refer to the muscle obsession condition as "athletica nervosa", although a more frequent term is BDD.

FAQs

How can BDD be diagnosed?
There are some aspects that should be investigated for the diagnosis of dysmorphia that include (a) the amount of time spent each day worrying about the appearance problem; (b) how much distress the perceived flaw causes (think about it for at least one hour a day); and (c) whether the concern has any behavioral consequences such as social avoidance.

If the patient's problem is perceived by the practitioners as being much more trivial than the patient perceives it to be, should this arouse suspicion of body dysmorphic problem?
Yes, dysmorphia may also be present in those patients as well.

In which situations should the practitioners avoid cosmetic procedures?
Mainly for those patients who are significantly depressed or psychotic or have BDD.

3.11 Marketing for Male Patients

It is important to understand population trends that provide information for marketing plans. According to US surveys, there will be a massive expansion of the 60- to 79-year-old age group over the next 20 years. There will be a slight contraction of the 40- to 59-year-old age group and the 20- to 39-year-old age group will grow by about 10 million persons. People over 80-years-old will also expand by nearly 50% during this time period. Because the 40- to 79-year-old group account for utilization of approximately 80% of surgical facial enhancement services, the demand for aesthetic facial surgery should remain high for many years (Holcomb and Gentile 2005b).

Not only will the population willing to be subjected to cosmetic procedures grow, but also the providers will also expand. Physicians will need to improve marketing efforts to maintain their position in the market.

Male patients are considered to be difficult to market to. They will preferably rely on their spouses than heed a call to action. It is the spouse who usually makes the arrangements and appointments for them. And they are the ones who usually bring up cosmetic issues such as hair loss or liposuction to start the discussion (Schlessinger 2007).

Nonsurgical forms of aesthetic enhancement is likely to play an increasingly important role because many male patients who started by nonsurgical procedures may ultimately elect to undergo aesthetic surgery. Despite the recent downward trends, men are still undergoing facial surgical enhancement procedures in significant numbers. However, there is an increasing request for nonsurgical facial enhancement procedures such as botulinum toxin and filler injections. Although male clients are increasing at a steady pace, they continue to represent a largely untapped segment of this market.

Key pointers

- Pictures of liposuction aimed at men should include the abdomen and flank areas.
- Laser hair removal photographs are most effective for male patients when male backs are shown prominently.

3.12 The Other Side of the Media

Men increasingly get their ideas of how they should look like from the imagery they see in the media. Younger men who are addicted readers of male fitness magazines could be psychologically harmed by the images of perfect male physiques they contain. Regular readers are more likely to exercise to excess and they may be driven to try to become

more muscular, even if that could harm their health. Even more worrying is that they are more likely to consider using anabolic steroids to improve their appearance. The message inside those magazines is that it is necessary to develop a muscular physique to attract a quality mate. As readers internalize this message, anxiety about their actual bodies is created and leads to increasingly desperate attempts to modify them. The volume of content is growing and it is trapping young people, in particular, into unhealthy obsessions about their own bodies.

Top 10 key pointers

- Male patients are becoming an important economical group for cosmetic procedures.
- Botulinum toxin and hyaluronic acid injections are the number one and the two most prevalent nonsurgical procedures among male patients, respectively.
- Men are generally less price-sensitive than women and more focused on their cosmetic target.
- Men prefer single treatments with long-lasting benefits due to the difficulty of scheduling multiple sessions.
- Men are most loyal patients, usually coming back without fail.
- The conversion rate to procedure is higher than in women, maybe due to the fact that only the very motivated rate patients reach the office.
- Men are less willing to report back to work if they have significant swelling or erythema after a cosmetic procedure, particularly if in a position where frequent social interactions are required.
- It is important to screen for psychological problems in cosmetic settings during the anamnesis. The target is to identify patients who may have poor outcome in terms of psychological adjustment and psychosocial functioning despite a technically satisfactory result.
- Some men will endure potential pain with steroids, botched implant surgeries, extreme weight lifting to reach their goals. Among men, however, there are those who focus on their muscularity. They are not seeking aesthetic perfection, but instead some kind of regularity or symmetry.
- *Treat Male Patients!*

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Common Skin Problems

4

Berthold Rzany

When treating aesthetic problems, it is very important not to forget the general condition of the skin, as this may also influence the aesthetic appearance of the patient. The following chapter tries to give an outline on common skin conditions and their treatment. Please be aware that this overview does not aim for completeness. Its purpose is to sensitize the reader.

4.1 Dry Skin

Dry skin (or xerosis) is not uncommon, especially in patients with eczema or preclinical eczema and in elderly patients. It can have a flaky appearance and patients often report a "tight" feeling.

Before treatment options are discussed with the patient, a thorough past history has to be conducted to find out if there are some external factors – like frequent or prolonged exposure to water (showers and baths!), using soaps and/or being exposed to dry air – that may aggravate the dryness of the skin. A first step would be to avoid these factors. The next step is to add moisturizers or even ointments (during the night) to ameliorate the symptoms. In patients with very sensitive skin, perfume-free products should be used.

4.2 Oily Skin

Oily skin reflects an increase in the production of sebum. It might be associated with large pores and acne. Sebum production seems to be higher in summer. In some patients, only some areas are affected by oily skin. Especially on forehead, nose, and chin, the sebum secretion was found to be higher than on the cheeks (Youn et al. 2005).

In patients with oily skin topical retinoids and in severe cases, even a course of oral isotretinoin might be helpful.

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4.3 Acneic Skin/Acne

Acne is one of the most common skin conditions. It is an androgen-triggered disease. Therefore, male patients usually show an increased prevalence and also an increased severity of this disease.

The pathogenesis of acne leading to the formation of microcomedo includes the following four: (1) androgen-increased hyperseborrhea, (2) hyperkeratosis of hair follicles, (3) microbial colonization mainly with *Propionibacterium acnes* and *Staphylococcus epidermides*, and (4) inflammation. Depending on the presence of inflammation, we find noninflammatory lesions with open or closed comedones or inflammatory lesions referred to as papulopustular, nodular or both. Severe inflammatory acne may lead to cysts and scars (Fig. 4.1a, b).

Treatment depends on the type and the extent of these lesions. Depending on these factors, there is a step-wise approach.

There are some differences in the acne therapy in men in contrast to women. Topical therapy has to be simpler, for example, combination products (see below) that require only a one time or twice daily application are usually preferable. There are fewer restrictions towards the oral therapy with isotretinoin, a drug which can be given only with strong precautions in women.

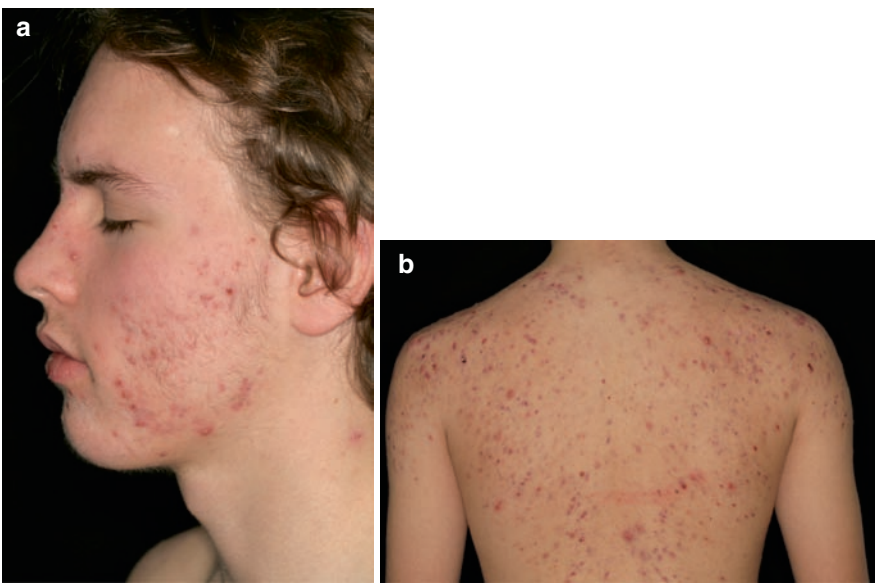

Fig. 4.1 (**a**) Young patient with facial moderate papulopustular acne. (**b**) Young patient with extensive papulopustular partially conglobate acne in the area of the back.

4.3.1 Comedonic Acne

Here topical retinoids are best. Adapalen, tretinoin, and to a lesser extend retinaldehyde are therapeutic options.

4.3.2 Papulopustular Acne

In additions to topical retinoids, papulopustular acne also requires agents with antimicrobial activity as benzoyl peroxide or topical antibiotics or oral antibiotics. All antibiotics should not be used continuously as bacterial resistances might occur (Leyden 2004). Therapeutic failure of topical as well as systemic antibiotic therapy might be due to decreased sensitivity or even resistance of specific strains of Propionibacterium acnes, which occurs in up to 25% of cases (Eady et al. 1993; Gollnick et al. 2003). In these cases, a change in the antibiotic regime or another therapeutic option is necessary.

4.3.3 Severe Acne (Nodular or Conglobate)

In severe nodular or conglobate acne, systemic therapy is mandatory. Oral isotretinoin is the treatment of choice here. Oral antibiotics are helpful initially in very severe cases.

Do's

- When using topical therapy, tell your patients not to apply it only to the lesions but to the whole area affected.
- Topical therapy, especially the combination products, is usually best used in the evening.

Don'ts

- Do not use continuously the same topical antibiotic. Resistances to *P. acnes* might occur and limit the efficacy of this treatment (Leyden 2004).
- Do not get the idea of using oral antiandrogens in men as they would inevitably lead to an unwanted feminization.

Key pointers

- In men with a lot of muscles and acne, always think of anabolics as a possible trigger factor for acne. Treatment might be difficult or nearly impossible if this trigger factor remains.

- Most men do not like complicated topical treatments. Keep it simple. Fixed combinations of adapalene and benzoyl peroxide or clindamycin and benzoyl peroxide are best.
- In case of a moderate to severe papulopustular acne and an otherwise healthy patient, consider to start a therapy with oral retinoids (standard therapy with 0.5–1 mg kg^{-1} day^{-1}). If started, oral retinoid therapy should be continued for at least 4–6 months.
- If you are enthusiastic about the effect of retinoids in men, be conscious that in women oral retinoids can be prescribed only in those using an effective contraception.

4.4 Scarred Skin

The most common facial scars are acne scars. Acne scars are more difficult to treat than the active lesions of acne. A scar is a permanent defect of the skin. The scar itself cannot be healed. What can be done is to decrease the visual difference between the atrophic or hypertrophic scars and the surrounding skin. To achieve good patient satisfaction, it is important that the patient gets a realistic impression on what can be done and what cannot be done.

4.4.1 Atrophic Acne Scars

There are three possibilities to decrease the visibility of these scars. Each of them can be combined.

4.4.1.1 Ablation of the Skin with the Aim to Decrease the Difference Between Normal and Scarred Skin

To achieve this several methods can be used: (1) dermabrasion, (2) deep peelings, and (3) ablative lasers with the fractional laser technique as the newest development.

The aim of this therapeutic option is to ablate the scarred and normal skin and by the effect of the ablation and the neocollagenesis to achieve a more normal skin surface.

Dermabrasion, deep peelings, and the ablative lasers should only be used by experienced physicians. If the ablation is too deep, scarring might be worsened. Furthermore, from the patients view, all of these methods come with certain down time.

The newest development in this field is the fractional laser technology (Alster et al. 2007). Here the ablative process of, for example, a CO_2 or an Erbium YAG Laser is split into several sessions with considerably less downtime. Although no good clinical trial has been reported for this indication, the present data especially for the Fraxel technology based on the CO_2 laser looks promising (Lee et al. 2008).

Less cost-intensive alternative needling with a roller has been proposed to stimulate neocollagenesis and by that an improvement of the acneic scars. The evidence for this technique, however, is scarce as for many nonmedical treatments. There is no Medline listed paper on this therapy so far.

4.4.1.2 Elevation of Atrophic Scars

Atrophic scars can be elevated by subscicion and by injectable fillers. Subscicion can be easily performed and the tissues beneath the scar is loosened by a sharp needle, preferably a tribeveled 18-Gauge hypodermic needle (Nokor, Becton Dickinson, Franklin Lakes, NJ, USA). The idea of subscicion is that new collagen formation based on the superficial injury will elevate the scar (Alam et al. 2005).

When using fillers, the preferences should go to biodegradable injectable fillers, which are suitable for very superficial injections as hyaluronic acids and collagen (Varnavides et al. 1987). Usually the amounts needed are very small. Multiple injections might be necessary. Other fillers as semipermanent and permanent fillers have been used, too (Barnett and Barnett 2005; Goldberg et al. 2006). However, these fillers should be used with caution as adverse events due to these fillers are much more difficult to treat (Gòmez-de la Fuente et al. 2007).

4.4.1.3 Excision of Ice Pick Scars

Ice pick scars cannot be treated by fillers. Small excisions either by punch or by scalpel will remove the deep scarring (Mancuso and Farber 1991) and substitute it with a much finer scar.

4.4.2 Hypertrophic Scars and Keloids

Hypertrophic scars and keloids need a different treatment concept. Here injections with, for example, glucocorticosteroids or glucocorticosteroid in combination with 5-Fluoruracil will lead to a decrease of the scar tissue. Treatment has to be performed carefully to avoid atrophy of the surrounding tissue (Darougheh et al. 2009).

Don'ts

- Do not promise patients with acne scars too much. To get completely rid of all scars is often not possible.
- Do not try to inject ice-pick scars with injectable fillers. The result will not be satisfactory.

Key pointers

- Acne scars require a multitreatment approach. Ice pick scars need to be removed by small incisions. Macular atrophic scars need an ablative approach. Subszision and injectable fillers can be helpful especially in large atrophic scars.

- When treating acne scars, it is mandatory that the patient gets a realistic impression on what can be done. Here pre- and post-photographs of the different procedures may be very helpful.
- In addition, certain lasers have been used to decrease hypertrophic scars and keloids. Again the evidence for these interventions is scarce.

FAQs

What is the effect of peelings with fruity acids as AHA on scars?
There is no evidence that fruity acid peels will ameliorate scars.

What is the most important rule for most acne patients?
Keep the treatment simple. One topical treatment if chosen right might be enough.

4.5 Sweaty Skin (Hyperhidrosis)

Sweating helps control body temperature (Lopez et al. 1994). However, excessive sweating (hyperhidrosis) can cause multiple problems. Since sweating is commonly associated with insecurity, people with excessive sweating may be stereotyped as lacking in confidence. Consequently, patients with excessive sweating might exhibit signs of social phobia (Weber et al. 2005).

Based on the extend of sweating sweating can be described as generalized or local. Generalized excessive sweating can occur over most of the body and may be caused by underlying infections, malignancies, or hormonal imbalances. In contrast, apart from some known trigger factors such as emotional challenges (Herbst et al. 1994), the reasons for localized (focal) sweating are not readily apparent. It is therefore described as idiopathic. Idiopathic sweating seems to have a genetic background as patients with focal hyperhidrosis often report a family history of hyperhidrosis (Chiou and Chen 1999). Focal sweating mostly occurs in the axillar region, as well as palmoplantar. It can also occur on all areas of the face. Here, it seems to be more common in the central forehead and scalp area.

There are no precise criteria for the definition of hyperhidrosis. Although the amount of sweat can be measured by gravimetry (usually in mg min^{-1}) and the area of sweating highlighted by iodine starch test, the diagnosis is mostly clinical: sweat pearls in various sizes are sufficient for the diagnosis.

Facial sweating or facial hyperhidrosis can significantly influence the aesthetic appearance (Fig. 4.2). It is characterized by sweat pearls usually focusing on the forehead region. However, the whole face can be involved.

The usual first therapeutic steps are topical aluminiumchloride hexahydrate with or without oral anticholinergic drugs. If this treatment is not sufficient, especially the forehead and the scalp botulinum toxin A may be used.

Fig. 4.2 Patient with severe facial hyperhidrosis.

4.5.1 Aluminiumchloride Hexahydrate

Topical aluminiumchloride hexahydrate is the cheapest and easiest form to treat focal hyperhidrosis. To be used in the facial area it should be diluted by water. (Rp: Aluminumchloride hexahydrate 15,0, Methylcellulose 1,5, Aqua. dest. ad 100,0). Especially in patients with a crew cut or in bald patients, the product should be used via a roll-on as it will make the application for the patient much easier. In patients with full hair, a roll-on is not suitable here, and the solution might be better directly applied by a pipette.

The product should be used in the beginning every other day. To ensure efficacy, the product needs to be used in the evening shortly before going to bed. If the treatment is efficacious, the treatment period can be lengthened to every 3 or 4 days. If the treatment is discontinued, hyperhidrosis will reoccur. Irritation is the main disadvantage of this drug. If it occurs, treatment can be paused for a couple of days.

4.5.2 Anticholinergic Drugs

In Europe, there are two anticholinergic drugs: bornaprin (4 mg per tablet) and methanthelinum bromide (50 mg per tablet) available for the treatment of hyperhidrosis. The drugs need to be given twice to three times a day to ensure continuous efficacy. However, in a lot of patients these drugs are only used to decrease peak symptoms for several hours in addition to, for example, topical methods. These drugs are basically safe. A dry mouth is usually the only adverse event that might bother some patients (Hund et al. 2004).

4.5.3 Botulinum Toxin A

Botulinum toxin A (BoNT-A) is a bacterial toxin that paralyses muscles and decreases sweating by blocking the release of the acetylcholine from presynaptic vesicles. It is given by injection into the deeper parts of the skin where the sweat glands are located. There are several brands available: Botox®, Xeomin®, and Dysport®. Botox®, Xeomin®, and Dysport® units can not be directly compared. One Botox/Xeomin® U is probably equivalent to 2.5 Dysport® U. The data for the also available BoNT-B brand is so scarce that it will not be discussed for this indication (Baumann et al. 2005).

In contrast to axillary hyperhidrosis, where two large RCTs have demonstrated the efficacy of BoNT-A (Heckmann et al. 2001; Naumann and Lowe 2001), there is no clinical trial demonstrating the efficacy of BoNT-A in facial hyperhidrosis. There are, however, some reports (Sanli et al. 2004) and recommendations for this treatment (Glaser et al. 2007).

The treatment with BoNT-A for hyperhidrosis is very safe. Systemic side effects are not likely. To a small degree, compensatory hyperhidrosis might occur (Heckmann et al. 2001; Naumann and Lowe 2001). However, especially in the facial area, there might be local adverse events due to an unwanted weakening of the underlying mimic muscles. Therefore, treatment needs to be very careful especially when approaching the area of the eyebrows of even further down.

To use BoNT-A for facial hyperhidrosis, a step wise approach is encouraged.

- Mark the area where the focal hyperhidrosis occurs.
- If not immediately visible, you might use the iodine starch test.
- Dilute the BoNT-A (start with one vial if you consider treating the anterior scalp and the forehead) with 4–5 mL per vial. Inject approximately 0.05 mL about 1–1.5 cm apart in the anterior scalp and forehead area using a 1 mL syringe and a separate 30- or 32-Gauge needle. Straight injections are less painful as more horizontal ones.
- Be careful while injecting in the lower forehead region to avoid brow ptosis.
- For more sensitive regions like the perinasal area, cheeks, and upper lip, treatment should be done very cautiously, for example, using the microinjection technique to avoid muscular dysfunction. Usually minimum amounts of BoNT-A (approximately 1–2 Dysport® U or the equivalent of Botox®/Xeomin®) should be applied.

Depending on the degree of hyperhidrosis and the dosages used, patients usually need a reinjection two or three times a year.

4.5.4 Other Interventions

Iontophoresis, which is the therapy of choice for palmar and plantar hyperhidrosis, is also possible in the facial area. However, it requires special masks. Therefore, it is rarely used for this indication.

Don'ts

- Do not ask your patients to apply the aluminiumchloride hexahydrate solution in the morning. It will not work as good since the substance will be carried away by the severe sweating.
- Never use salvia or other herbal remedies in any form in patients with severe hyperhidrosis. It is good for cooking but it just does not work in hyperhidrosis.

Key pointers

- Always start in focal hyperhidrosis with a topical treatment with, for example, a 15% aluminiumchloride hexahydrate solution.
- If this treatment is good for the routine but fails to effectively reduce sweating in stressful situations, include an oral anticholinergic drug.
- Botulinum toxin A should be used as a second line therapy. It is absolutely safe in the scalp region. In the middle or lower facial area, it needs to be used more carefully to avoid a weakening of the underlying muscles. Here in some areas the microinjection therapy with BoNT-A can be used.
- Surgical interventions like sympathectomy have been performed, too, to reduce facial sweating (Doolabh et al. 2004). Although these operation techniques themselves are pretty safe nowadays, the results are often hampered by compensatory sweating, which might significantly influence the quality of life of these patients (Hasche et al. 1997; Furlan et al. 2000).

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Common Hair Problems: Dandruff and Androgenetic Alopecia

5

Berthold Rzany and Frank Bachmann

Dandruff is one of the most frequent complaints in men. The other is unwanted hair loss. Although baldness is much more accepted in men than in women, the loss of hair is a concern of many men. In the following chapter, we focus on these concerns and highlight some possible solutions. Nevertheless, be aware that the aesthetic physician does not necessarily have to treat all these conditions. Aesthetic physicians should be aware of these conditions and refer patients to other specialists depending on their own expertise.

5.1 Dandruff

What is dandruff? Basically dead skin cells that are most frequently a result of an increased skin turnover. The reasons may vary from subclinical eczema, mostly seborrhoeic eczema, to a full blown psoriasis of the scalp that will require a thorough treatment by a dermatologist.

5.1.1 Goals of Treatment

The goal of treatment is straightforward: to reduce the extensive scaling.

5.1.2 Topical Treatment Options

How can dandruff be regulated? Several treatment options exist. Their goals are three fold: (1) keratolytic, (2) antiinflammatory, and (3) antifungal. Why antifungal? Because frequently dandruff is a sign of an infection with Pityrosporon ovale, which can be easily contained by an antimycotic treatment (Table 5.1–5.3).

Shampoos often contain further antimicrobial agents such as selenium disulfide, zinc pyrithione 1% (Marks et al. 1985), piroctone olamine (Futterer 1988). Their efficacy is

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Table 5.1 Interventions against dandruff: Keratolytic agents (modified from Trüeb (2007))

Intervention	Mode of action	When to be used	Comments
Keratolytic agents Salicylic acids (Leyden et al. 1987)	Break down of cell aggregation and helps to loosen flakes	In all forms of dandruff	Salicylic acid is one of the standard treatment options. It can be combined with other substances like sulfur (Leyden et al. 1987) or, e.g., piroctone olamine and elubiol (Pierard-Franchimont et al. 2000)

thought to be weaker compared to 2% ketoconazole (Pierard-Franchimont et al. 2002; Georgalas 2004).

5.1.3 Systemic Treatment Options

In severe Pityrosporon-associated dandruff, an oral antifungal therapy with, for example, ketoconazol or fluconazol is possible. This, however, should be a second line therapeutic option. Oral therapy is often used in another Pityrosporon-associated disease: Pityriasis versicolor (Farschian et al. 2002).

Do's

- In patients with recurrent dandruff based on an inflammatory skin condition, maintenance therapy with an antifungal agent (shampoo), for example, once a week, is recommended.

Don'ts

- Do not use keratolytic ointments in nonbald patients with dandruff. This topical therapy is always messy. Shampoos are a much better option.

Key pointers

- Dandruff is a common problem. The first step should be to rule out a dermatological disease that may require a specific treatment by a dermatologist.
- Shampoos containing keratolytic and other anti-dandruff agents are the first treatment choice. Shampoos are only useful if they are used at least three times per week.
- If dandruff is a sign of inflammation, anti-inflammatory as well as antifungal agents should be considered.

Table 5.2 Interventions against dandruff: Antinflammatory agents (modified from Trüeb (2007)

Intervention	Mode of action	When to be used	Comments
Topical steroids	Decrease of inflammation	Especially helpful in seborrhoeic dermatitis and psoriasis of the scalp	This is the treatment of choice for all inflammatory conditions causing dandruff.
• Betamethasone valerate 0.12% thermophobic foam (Milani et al. 2003)			Typical local adverse events as thinning of the skin or hypertrichosis are of less concern in the scalp region.
• Clobetasol propinate shampoo 0.05% (Reygagne et al. 2007)			A shampoo-like application is encouraged.
Coal tar (Pierard-Franchimont et al. 2000)	Inhibition of overproduction of keratinizing cells	In case of seborrhoeic dermatitis, mild psoriasis of the scalp	Coal tar has a long therapeutic history. This treatment is not available anymore in all countries because of probably clinically irrelevant safety concerns (van Schooten 1994; van Schooten 1995; Milani et al. 2003).

Table 5.3 Interventions against dandruff: Antifungal agents (modified from Trüeb (2007)

Intervention	Mode of action	When to be used	Comments
Antifungal agents	Decrease of fungal population of the scalp	If there is inflammation or other signs of pityrosporon ovale infections, like pityriasis versicolor	Shampoos containing antifungal agents.
• Ketoconazole 2% (Brown et al. 1990; Danby et al. 1993)	Interference with the fungal synthesis of ergosterol, a constituent of cell membranes, as well as with certain enzymes		Ketoconazole shampoos are effective in controlling dandruff (Pierard-Franchimont et al. 2002), sometimes they are combined with other substances as zinc pyrithione (1%) (Saple et al. 2000). Tolerance of the shampoo is very good (Danby et al. 1993). For maintenance therapy, ketoconazole 2% shampoo is used prophylactically once a week (Peter and Richarz-Barthauer 1995).
• Ciclopirox olamine 1.5% (Shuster et al. 2005; Gupta and Nicol 2006)	Ciclopirox has both antifungal and anti-inflammatory properties (Gupta and Nicol 2006). Ciclopirox acts through the inhibition of cellular uptake of essential compounds (Korting and Grundmann-Kollmann 1997)		Ciclopirox shampoo is an effective and safe treatment for seborrhoeic dermatitis (Squire and Goode 2002; Abeck 2004; Altmeyer and Hoffmann 2004) and may be combined with salicylic acid (Squire and Goode 2002).

5.2 Androgenetic Alopecia

Androgenetic alopecia (AGA) is the most frequent type of alopecia. The prevalence of AGA in men is highly age-dependent and affects approximately 30% of men under 30 years of age, 50% under 50 years of age, and 70% under 70 years of age (Hamilton 1942; Severi et al. 2003). Most men with AGA show a typical pattern of hair loss, often beginning at the temples and in the vertex area (Hamilton 1942; Norwood 1975) (Figs. 5.1a,b).

5.2.1 Background of Androgenetic Alopecia

The main characteristic microscopic feature of AGA is the progressive shrinking of scalp hair follicles (Paus and Cotsarelis 1999) accompanied, in many patients, by an acceleration of the hair growth cycle. AGA is a genetically determined condition that leads to a permanent loss of hair with normal levels of androgens. Whether and when a scalp hair follicle miniaturizes is dependent on two factors: genetics and androgens (Hamilton 1942). Each scalp hair follicle carries individual genetic information that determines whether and when it will develop sensitivity towards androgens. If sensitive to androgens, scalp hair follicles will progressively shrink over the next years. In men, the most important androgen driving AGA is dihydrotestosterone (DHT). DHT is derived from its precursor testosterone by two

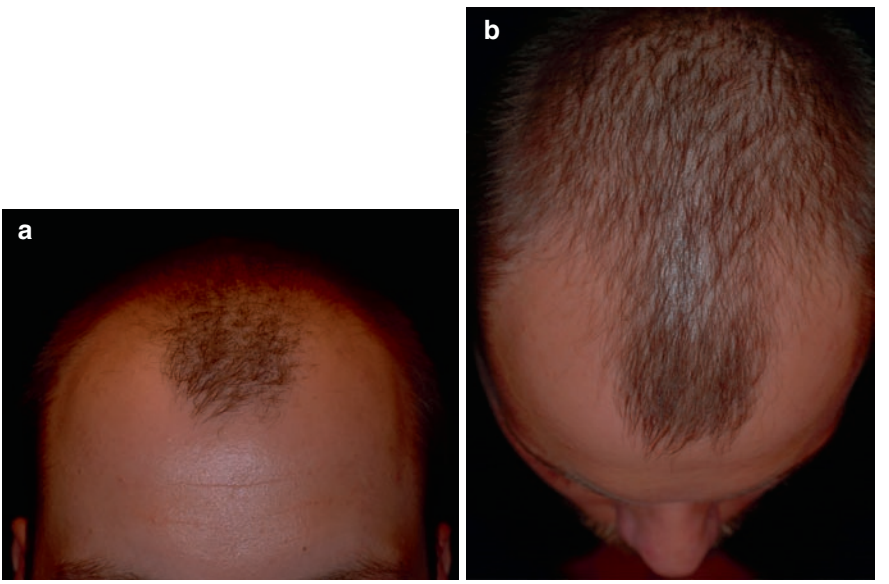

Fig. 5.1 (**a**) and (**b**) Patient with progressed androgentic alopecia (Norwood type 3; Norwood 2005)

enzymes: the 5-alpha-reductase types I and II (Bayne et al. 1999). This process is taking place within the cells of the hair follicle.

If left untreated, AGA will progress until all hair follicles are miniaturized that have developed a genetically determined sensitivity towards androgens. In its maximal expression, all hair follicles can be lost from the top of the scalp. Occipital hair follicles in contrast never develop sensitivity to androgens and are, therefore, never lost in AGA.

5.2.2 Goals in Treatment

In the treatment of AGA, the two major goals are (1) to stop hair loss and (2) to stimulate regrowth. However, regrowth is possible only to a certain extent as far as the hair density can be increased by reenlargement of individual hair follicles. Stopping hair loss and its regrowth can be visibly seen, and it is reflected by an increase in the visible hair density using standardized photography of hair scalp (Canfield 1996).

5.2.3 Topical Treatment Options

A myriad of topical treatment options is available. However, most treatment options do not hold against the methods of evidence-based medicine. In fact, with a scrutinized look only one remains: topical minoxidil.

Minoxidil is a vasodilatator that is used to control hypertension. Several randomized controlled trials (RCTs) showed that minoxidil 2–5% solution applied twice daily can increase test area hair counts and hair weights in men with AGA (de Groot et al. 1987; Katz et al. 1987; Price 1999; Olsen et al. 2002; Price et al. 2002; Saraswat and Kumar 2003). Topical minoxidil is available as 2% or 5% solution. It needs to be applied twice daily. For men, the 5% solution is recommended. Minoxidil 5% solution only works as long as it is applied. Hair loss will resume when the regular applications are stopped.

Minoxidil is well tolerated. Systemic effects are extremely unplausible as the serum concentrations of topically applied minoxidil are very low. In a large 1-year-prospective study on more than 10,000 male minoxidil users, no serious systemic side effects were reported. However, in approximately 5% of men, minoxidil causes redness and itching of the scalp skin. In most men, this effect seems to be nonspecific irritation by polyethylene glycol or other solvents; in some, however, a specific type IV allergy was shown (Friedman et al. 2002).

5.2.4 Systemic Treatment Options

In men, in contrast to women, where you can work with antiandrogens, there is only one systemic therapeutic option: oral finasteride. Finasteride inhibits the enzyme 5-alpha-reductase type II, thereby preventing the intracellular conversion of testosterone to its more active

metabolite DHT (Rittmaster 1994). In men, DHT is essential for the development of AGA, and finasteride decreases DHT by 70%, both in the scalp skin and in serum (Drake et al. 1999). The usual dosage is 1 mg per day.

Another indication for finestaride is the benign prostatic hyperplasia (BPH). BPH is characterized by an increase in the size of the prostate (hyperplasia of prostatic stromal and epithelial cells) in middle-aged and elderly men, resulting in the formation of large, fairly discrete nodules in the periurethral region of the prostate. An obstruction of the urethra results if the nodules are sufficiently large and partially or completely compress the urethral canal. In contrast to the treatment of AGA, an oral administration of 5 mg finasteride (e.g., Proscar®) and in combination with a α1-adrenergic receptor antagonist, for example, Doxazosin®, is recommended (MSD Chibropharm GmbH 2008).

As for minoxidil, the evidence base is very good. Several large trials can be found (Kaufman et al. 1998). In a large multicenter clinical trial of more than 1,500 patients, Kaufman et al. (1998) demonstrated a significant increase of hair counts in the finasteride treatment group. Men on placebo, in contrast, had a progressive loss of hair count. Men who were switched from finasteride to placebo after 1 year lost the hair gained under finasteride. In the first year, 48% of men in the finasteride treatment group had visibly increased hair density in the vertex area, compared with 7% in the placebo group. This increased further with continuing treatment. In the second year, 66% of the men in the finasteride group had visibly increased hair density, compared with only 7% in the placebo group (Kaufman et al. 1998). Five-year data demonstrate that hair loss can be stopped in 90% of men taking finasteride, compared with 25% in the placebo group.

Finasteride is well tolerated. Sexual side-effects as the decrease of libido were reported. However, their prevalence is low. In both the finasteride and the placebo group, a decrease in libido of 1.9% vs. 1.3%; a decrease in potency of 1.4% vs. 0.9%; and a decrease in ejaculate volume of 1.0% vs. 0.4% were reported. Although the differences between the finasteride and placebo groups were small, statistically not significant and were not seen in other studies (Tosti et al. 2004), finasteride must be considered capable of causing such effects in some men.

Again as with topical minoxidil if the treatment is discontinued, hair loss will resume (Fig. 5.2a, b).

5.2.5 Hair Transplantation

Hair transplantation is another option to correct the influence of AGA. The principle is basically very simple. Hair follicles from the occipital area, which are not androgen–sensitive, are transplanted to areas affected by hair loss. Which sounds simple has certain challenges: (1) the creation of an aesthetic pleasant anterior taking into account the potential progression pattern of the AGA and (2) the correct transplantation of the hair avoiding an artificial appearance.

Several techniques for hair restoration are available. The technique that seems to give the most satisfying results is the follicular unit transplantation (FUT) technique where hair roots are harvested under magnification (Epstein 2007). In this technique, hair roots are

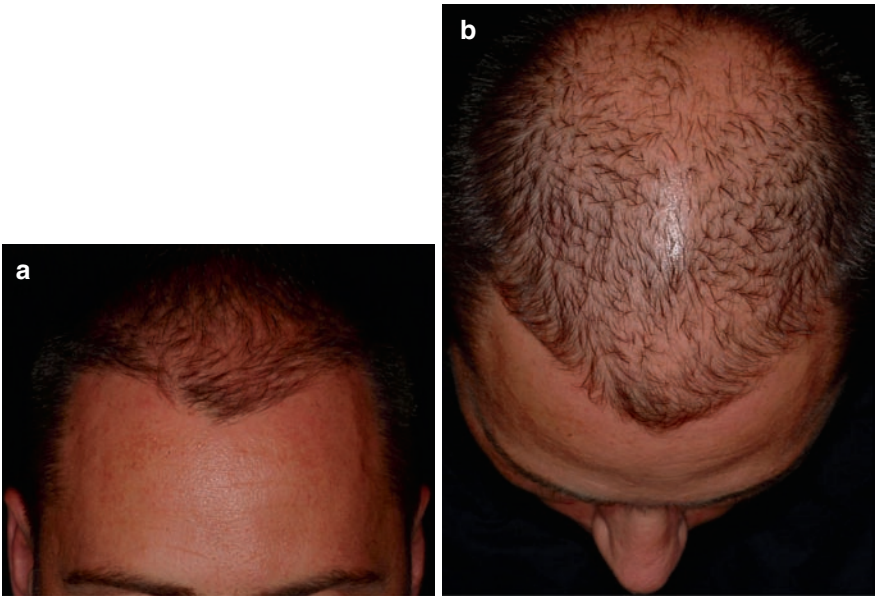

Fig. 5.2 **a**, **b** Patient with antiandrogeneic alopecia and irregular intake of oral Finasteride over a period of 3 years (Norwood type 5; Norwood OT 2005)

harvested into natural follicular units that contain 1–4 hair roots. According to Tan Baser et al. (2006), irregular seeding is recommended instead of seeding in rows. Furthermore, the direction of hair growth has to be taken into account to avoid a "sprouted grass" look. Additional care should be given particularly to patients with dark-colored and hard hair. Hair transplantation should be performed only by experienced colleagues to avoid unpleasant aesthetic results.

There is some evidence that the addition of finasteride will improve the overall appearance (Leavitt et al. 2005).

Do's

- Start treatments against hair loss on patients only if they are willing to continue the treatment for at least 1 year.
- Do evaluate the treatment effect not before 6 months. In some patients, the effect appears even later.

Don'ts

- Do not promise the patients, too much. A stabilization of hair loss is a good result, even better, when there is regrowth.
- If the hair follicles are atrophic, no medical intervention will lead to a sufficient aesthetic result. In these patients hair transplantation might be discussed.

- Do not recommend interventions where there is no or limited evidence for effectiveness. Why should your patients waste money on herbal remedies or even electromagnetic field therapy when two sufficiently good treatment options exist?

Key pointers

- Both oral Finasteride 1 mg per day and 2–5% topical Minoxidil 2 × 1 mL[2] per day are effective and safe in the treatment options of mild to severe AGA (Arca et al. 2004).
- The combination of both treatment options is possible. However, it is recommended to start with one option first and then add the other treatment after 6 months.
- Hair loss will resume when either treatment is stopped.
- Hair transplantation is only something for experts. Avoid unhappy patients with weird looking outcomes by refering them to those of us specialized in these techniques.
- If you are interested in doing hair transplantation yourself, look for somebody who can train you!

FAQs

Do shampoos increase hair loss?
There is no evidence that shampoos will increase hairloss.

Can the cheaper 5 mg Finsteride tablets be used in stead of 1 mg tablets?
In several countries, the 5 mg tablets that are used for benign prostatic hypertrophy are cheaper that the 1 mg tablets. Therefore, doctors sometimes prescribe the patients the 5 mg tablets and have the patient divide them in four parts. If these parts would be equal the treatment effects might be supposingly the same. However, there is no RCT to prove that. In general, the intake of the 1 mg tablets should be encouraged.

Can Finasteride and 2–5% Minoxidil solution be combined?
Finasteride 1 mg per day and 2–5% Minoxidil solution 2 × 1 mL[2] can be combined. Especially in patients for whom, after 6 months, one intervention does lead to stabilization but not improvement, combination therapy might be initiated.

Can Finasteride 1 mg per day be given before/after a hair transplant?
It definitely can and is recommended, as Finasteride helps to control AGA and therefore decreases the risk of an inappropriate aesthetic result (Leavitt et al. 2005) due to progressing AGA.

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Chemical Peeling

6

Mauricio de Maio

6.1 Introduction

Before indicating any chemical peel for male patients, it is important to clarify what the benefits and limitations of the treatments are. Chemical peels are skin exfoliants to the epidermis and dermis, and the level of the peel is determined by the level of penetration, destruction, and inflammation of the acidic chemical agents. As a general rule, light peels improve mild defects, medium-depth peels correct moderate defects, and deep peels may be indicated for severe cases. Male patients possess thicker skin and more adnexal follicles when compared with women. The skin also has higher oil content and predisposition for acne infection that causes scars. Historically, male adult patients and adolescents are not so keen on applying topical creams and oral antibiotics on a daily basis, which would lead to the decrease of acne formation. Luckily, with the introduction of oral isotretinoin and the fact that the young male patients are more aware of the necessity of skin care, the cases of acne sequelae are reducing (Fig. 6.1) (Taub 2007). Nowadays, skin conditioning and skin rejuvenation for any patient, including male patients, have become necessary due to the substantial increase in population over the 60 years. Most of the male patients maintain good general health and physical activity and fitness (Ramos-e-Silva and da Silva Carneiro 2007). However, in contrast to women, male patients will hardly adhere to any prepeel treatment if it is not simple and practical (Bergmann 2007).

Another important aspect to point out is that male patients fear pain and social embarrassment with aesthetic procedures more than women do. If patients' information and consent is important for female patients, it is mandatory for male patients.

Key pointers

- Male skin contains more collagen than female skin at all ages. Male skin is approximately 25% thicker than female skin.
- After puberty, sebum production is greater in men than in women throughout life.
- Male patients are not so keen on applying topical creams and in taking oral antibiotics on a daily basis, which would lead to the decrease of acne formation.

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Fig. 6.1 The treatment of inflammatory acne is complicated in adolescents due to their frequent difficulties to follow the medical plan. The association of oral isotretinoin and light chemical peels is recommended to speed up the process.

6.2 Indications for Chemical Peels

It is very important to diagnose at what level the skin defects lies to correctly select the adequate chemical agent. The upper epidermal defects found in male patients include ephelides (freckles) and superficial hyperpigmentation. Dermal defects include deep wrinkles and acne or traumatic scars. There are other defects that may compromise both the epidermis and the dermis, such as lentigos, actinic keratoses, superficial wrinkles, and postinflammatory hyperpigmentation. It is important to point out that chemical peels are not suitable for the treatment of large pores or telangiectasias (Fig. 6.2).

Do's

- Do indicate superficial peels for active acne and for pseudofolliculitis barbae.
- Do indicate superficial to medium peels to improve superficial hyperpigmentation such as freckles.
- Do indicate medium-depth peels to bleach lentigos and superficial hyperpigmentation.
- Do indicate deep peels to bleach deep hyperpigmentation.
- Do indicate superficial to medium-depth chemical peels to correct actinic skin due to sun damage.
- Do indicate medium-depth to deep peels to improve static wrinkles.
- Do indicate medium-depth to deep peels for acne scars.
- Do indicate medium-depth to deep peels to flatten mild scarring.

Fig. 6.2 This patient presents both intrinsic and extrinsic ageing signs. Deep nasolabial fold and oral commissure and the presence of moderate skin laxity at the mandible level are typical intrinsic signs. The skin presents with extended solar elastosis and multiple lentigines, telangiectasia. In the forehead, there are both dynamic and static wrinkles with actinic damage. Poikilodermia can be seen on the neck. There is a decrease of the subcutaneous fat.

Don'ts

- Do not treat hyperpigmentation in ethnic dark-skinned male patients with chemical peels if you are not experienced.
- Do not peel any male patient if he is very suntanned, it may increase the risk of hyperpigmentation and demarcation lines.
- Do not consider chemical peels to treat tiny vessels on the skin (telangiectasia).
- Do not indicate chemical peels to reduce skin pore size. Mid and deep peels may even increase them temporarily due to epidermal and upper dermal necrosis and sloughing.
- Do not indicate any chemical peel for the treatment of saggy skin. It should be treated by surgery.
- Do not indicate chemical peels for deep depressed scarring.

6.3 Classifications of Chemical Peels

It is important to know at what level in the skin the defect is to ensure that the chosen peel will be deep enough to correct it. The diagnosis should be made to know if the skin problem lies in the epidermis, in the upper, mid, or lower dermis.

Light superficial peels stimulate the epidermal growth through the removal of the stratum corneum without necrosis and through exfoliation; the epidermis thickens and produces neither erythema nor profuse desquamations. *Superficial peels* are those that destroy the epidermis and induce epidermal regeneration. Superficial wounds may affect any of the following skin layers: stratum corneum, stratum granulosum, stratum spinosum, stratum basale, and papillary dermis. Those peels that affect the epidermal and dermal junction present desquamation and short-lived erythema (Monheit 2004). *Medium depth peels* and *Deep peels* lead to prolonged erythema, profuse desquamation, and collagen remodelling. Collagen and vascular neoformation results from upper reticular dermal (medium depth peels) and mid reticular dermal (deep peels) injuries (Monheit 2001). The lower reticular dermis should not be destroyed because of the high possibility of full-thickness wounds, which result undoubtedly in severe scarring and in the need of skin grafts.

Key pointers

- The dermis varies in thickness from 0.3 mm (300 μm) on the eyelid to 3.0 mm (3,000 μm) on the back.
- Superficial peels cause wounds of about 60–100 μm and reach the papillary dermis. The problems that may be treated include skin dryness and roughness, keratoses, ephelides, solar lentigos, and hyperpigmented spots.
- Medium-depth peels affect the upper reticular dermis and may deepen from 450 to 600 μm of skin thickness. They are indicated to treat upper dermal hyperpigmentation, superficial wrinkles, and superficial acne scars.
- Deep peels invade the mid reticular dermis at a depth of 600–800 μm. They are usually indicated for deep wrinkles and scars and severe photodamage.

6.4 Superficial Peels

Very superficial peels are very suitable for male patients. They are quick to apply and cause no vesicles and desquamation. They are very practical for male skin conditioning and require no downtime. They are known as “refreshing peels.” Multiple applications for effectiveness are required and the risk of complications is very low. They are the ideal peels for patients with dark skin complexion (Fig. 6.3). Alpha-hydroxy acids (AHAs) are the prototype of the very superficial peels in variable concentrations. AHAs applied topically in lower concentrations diminish corneocyte cohesion. Glycolic acids at 50% or 70%

Fig. 6.3 Male patient with dark skin complexion with epidermal and dermal hyperpigmentation. The use of chemical peels should be carried out carefully. Serial light peel with 50% or 70% glycolic acid is an option. The interval can be once a week to speed up the treatment. Home care with bleaching creams and intense sun protection is mandatory. If this patient is subjected to either mid or deep peel, an intense post-inflammatory hyperpigmentation may result.

are the most commonly used peels by physicians. The pH and the unbuffered and buffered solution do interfere with skin penetration. Usually a pH at 2.5 is more commonly used. Very low pH (less than 1.0) and unbuffered solution of glycolic acid may turn it into a focal aggressive agent, provoking epidermolysis and hyperpigmentation. Another option is the salicylic acid (beta-hydroxy acid) that has been used for several decades already. It is lipid soluble and, as a result, is able to penetrate the comedones better than other acids, which is very suitable for male patients. The anti-inflammatory and anaesthetic effects of the salicylate also result in a decrease in the amount of erythema and pain. The most common concentrations used are 20% and 30% (Fig. 6.4).

Other superficial peels also include Jessner's solution and 10–25% TCA peels. In contrast to AHAs peels, they will present with mild scaling and skin redness. The skin becomes more sensitive, but they are more effective for hyperpigmentation and fine skin wrinkling. Jessner's solution contains resorcinol, salicylic acid, and lactic acid diluted in ethanol. It should be stored in a dark bottle. Depending on the number of coatings, it may produce prolonged scaling up from 4 to 7 days. TCA peels, even the superficial ones, cause discomfort during application. Male patients usually find scaling uncomfortable, and so adequate information is advisable. A fan or cool gel packing may be helpful. Light exfoliation may last up to 7 days (Zakopoulou and Kontochristopoulos 2006).

Fig. 6.4 Patient with pseudofollicullitis barbae that can be improved by light chemical peels. Seventy percent glycolic acid or 30% salicylic acids are good options. It is very important to point out that the poilkilodermia on the neck should be treated with laser or IPL and not with chemical peels.

Do's

- Do apply glycolic acid for acne lesions and pseudofolliculitis barbae. Acne pustules and comedones open and heal more rapidly.
- Do ask your patients to discontinue home skin-care creams while the skin is sensitive, especially if the regimen includes tretinoin or AHAs. They may re-apply usually after 5–7 days.

Don'ts

- Do not indicate glycolic acid peels as the single treatment for static wrinkles. They are not effective.
- Do not apply more than a single coat of 10–25% TCA if you intend to perform a light peel.

Key pointers

- Very superficial peels are very suitable to male patients. They are quick to apply and cause no vesicles and desquamation. They are very practical for male skin conditioning and require no downtime.
- As light exfoliation without vesiculation is expected after superficial peels, male patients may carefully shave on the following day with electrical razors and blades if the skin is not too sensitive.
- Jessner's solution is a classic peel agent to accelerate the resolution of post-inflammatory hyperpigmentation.

FAQs

Can multiple superficial peeling sessions produce the same result as a medium-depth or deep chemical peel?
No, because they are unable to stimulate the mid and deep dermis sufficiently and will never be able to correct dermal defects.

What is the benefit of the salicylic acid peels for male patients?
Salicylic acid peels are indicated for the treatment of folliculitis found in several skin areas such as the external aspect of the arm in male patients.

6.5 Medium-Depth Peels

Medium-depth peels intend to produce upper reticular dermis wounds. They are indicated for actinic keratoses, wrinkles, dermal hyperpigmentation and mild acne scars. The classical peel of this category was the 50% TCA in the past. Because of the risk of scarring, the combination of two superficial agents has been advocated to increase safety and reach the desired depth. The combination of Jessner's solution and 35% TCA or 70% glycolic acid and 35% TCA are one of the options. Both agents are applied before the TCA to weaken the epidermal barrier and increase TCA penetration into the dermis (Camacho 2005).

Do's

- Do combine 35% TCA either with glycolic acid or Jessner's solution to improve TCA penetration and uniform action.
- Do indicate medium-depth combination peels for acne scars twice or three times a year for male patients.

Don'ts

- Do not indicate medium-depth peels for active acne lesions.
- Do not use EMLA before TCA peels especially above 30%. The induced vasoconstriction may decrease dermal fluid to neutralize TCA and lead to undesired deeper penetration.

6.6 Deep Peels

Phenol is still the classical deep peel that may penetrate into the reticular dermis. It is capable of correcting severe photodamage and acne scars found in male patients. The Baker–Gordon formula consists of a mixture of 3 mL of 88% phenol, 2 mL of tap or

distilled water, 8 drops of septisol liquid soap, and 3 drops of croton oil. Phenol is a very potent protein coagulator. The liquid soap, as a surfactant, reduces surface tension and leads to an even peel. The croton oil is an epidermolytic vesicant that increases phenol penetration and inflammation. Owing to the fact that it is a deep peel, it is more prone to hypopigmentation and scarring. In experienced hands, the results on acne scars and deep wrinkles seem to compensate the disadvantages (Landau 2005).

Key pointers

- Deep peels can be occluded and nonoccluded. The occluded method causes deeper penetration.
- Occlusion in male patients can provoke discomfort and difficulties in bandage adherence due to beard growing. That makes nonoccluded peels more adequate for male patients.

FAQs

Why does occlusion lead to deeper phenol penetration?
Any artificial barriers such as zinc oxide tapes prevent phenol evaporation from the skin and by that enables the solution to penetrate deeper.

6.7 Interaction of the Chemical Agent and the Skin

The contact of the chemical agent and the skin will result in a specific skin reaction. Light peels may cause only a sudden redness on skin, while strong agents may lead to protein coagulation or agglutination and may result in solid white skin appearance. This whitening is called frosting. Level I frosting is defined as erythema with irregular blotchy frosting. Level II is a white-coated frosting with erythema showing through. Level III frosting is a solid white enamel frosting with no background of erythema (Fig. 6.5) (Rubin 1995).

According to the agent used, there is a difference of speed in the frosting. Generally, Jessner's solution exhibits a Level I frosting of slow evolution; TCA exhibits a Level II of medium evolution, and Baker's phenol is a rapid Level III frosting. Peels with AHAs should not present any frosting.

Key pointers

- The appearance and uniformity of the frost indicate how evenly the agent has been applied.
- The frost uniformity is enabled by skin pretreatment with tretinoin or AHAs.
- The absence of erythema in the background of the Level III frosting indicates penetration through the papillary dermis.
- The gray white frosting indicates a deeper penetration into the dermis and is characteristic of the Baker's phenol.

Fig. 6.5 Patient with acne scars subjected to 70% glycolic peel followed by 35% TCA. Please note the evident frosting difference. At the forehead, Level II is a white-coated frosting with erythema showing through. On the cheek area, Level III is represented by a solid white enamel frosting with no background of erythema. Scaling is expected to be longer on the cheek area than on any other facial cosmetic unit.

6.8 Skin Pretreatment

Pretreatment of the skin has been controversial over the past decade. Male patients are not so keen on using topical creams due to discomfort of some oily preparation. However, topical agents prior to medium-depth or deep peels will give an idea of how the male patient will behave after the treatment if some complications such as hyperpigmentation occurs. If he refuses to use topical creams or use them irregularly in the pretreatment phase, the control and resolution of complications will be affected. Usually, tretinoin is one of the most commonly used substances in the preprocedure care. It is known to promote thinning of the stratum corneum with activation of keratinocytes, speeding up reepithelization. The pretreatment may be started several weeks prior to peeling or at least 15 days before (Nanda et al. 2004).

Do's

- Do pretreat oily male skin with topical creams prior to chemical peels. It enables a more uniform penetration of the agent.

Don'ts

- Do not apply mid or deep peels in male patients that have shown no regularity in the use of skin care pretreatment. It may increase the risk of pigmentary complication.

Key pointers

- Male patients will hardly adhere to any prepeel treatment if it is not simple and practical.

FAQs

What are the benefits of skin pretreatment in male patients?
It facilitates uniform penetration of the chemical agent and speeds up the healing process. However, another very important aspect is that it allows to make certain that the male patient is willing to use products, such as bleaching agents and sunscreens, regularly after the peel. If he does not tolerate them, the choice of the peeling must be made accordingly.

6.9 General Rules and Technique

There are some steps to follow that will enable a correct peeling application. Male patients should be asked to shave one day before the procedure or in the morning if the peeling is to be performed in the evening. To shave and immediately apply the chemical agent leads to deeper penetration and more pain.

As male patients' skin is oilier than that of women, in general, it is advisable to degrease the skin prior to the peeling. Acetone, alcohol, or soap may be used to degrease the skin. Acetone is the most potent degreaser and will lead to a deeper penetration of the peel.

The chemical agent should be poured into a glass cup before application. Depending on the agent chosen, cotton-tipped applicators, sable brushes, or gauze sponge may be used. Among all practitioners' preference, we may find the use of sable brushes for AHA and Jessner's solution; gauze sponges for TCA; and cotton-tipped applicators for phenol.

To systematize the application, the face is divided into six cosmetic units: forehead, left cheek, right cheek, perioral, nose and periorbital areas. For any chemical agent to be used, this sequence can be obeyed by moving from the least sensitive to the most sensitive areas.

6.9.1 AHA Peels

Before the procedure, male patients are asked to wash their faces with soap to reduce skin oiliness or a defatting agent may be gently applied. Although both unbuffered solutions of 50% or 70% glycolic acids may be used, the 70% glycolic acid has proved to be more

effective. The agent may be rapidly applied with a sable brush all over the desired area. The effectiveness of glycolic acid is time-dependent and may vary according to the indication. If severe erythema occurs before the planned time, the patient should be asked to wash profusely his face in a sink to ensure complete removal of the acid. If tiny focal frosting is perceived, gauze with water should be applied onto the area to dilute and decrease the epidermolysis and the occurrence of crusting (Fig. 6.6).

6.9.2 Jessner's Solution

Sable brushes are adequate for applying Jessner's solution. An even distribution on the treated area should be undertaken with coats. The target is to obtain the frosting Level I. Usually, more than one coat is necessary for that. We can apply coatings after 3 or 4 min until the desired frosting is obtained. Microcrystallization of the salicylic acid may be found and that should not be misdiagnosed as frosting.

6.9.3 Superficial TCA Peels

Although they can be applied with sable brushes, a gauze pad is usually preferable to apply TCA peels. The gauze should be moist and not soaked to avoid uneven spread of the product. The gauze should be firmly rubbed against the skin. Overcoating should be avoided for superficial TCA peels.

Fig. 6.6 Immediate aspect of the skin of an adolescent with acne lesions after a 70% glycolic acid remaining on the skin for 2 min. After tap-water washing, the treated skin and lesions become reddish. Only oily-free topical creams should be applied in this patient before and after the treatment.

Do's

- Do start to apply the peeling agent from the least to the most sensitive areas. It will be more appropriate for male patients.
- Do degrease the oily skin in male patients because that may interfere with the chemical agent penetration.

Don'ts

- Do not use acetone as a degreasing agent in dry skin of male patients if a light peel is desired. It may cause focal undesirable crusts and deeper penetration.
- Do not let male patients shave immediately prior to peeling application. It leads to unnecessary deeper penetration and more pain.

Key pointers

- Thick sebaceous skin of male patients may not respond well to peelings unless effective degreasing is carried out.
- The sable brushes deliver the chemical agent more rapidly and to a wider area while the gauze sponge enables rubbing and the cotton-tip precision.
- AHA peels are considered lunch-time peels for male patients. A quick recovery, with no downtime and no crusts formation is expected.
- Peeling with Jessner's solution usually takes for 4–5 days of scaling. One day after the application, the skin turns darker and starts to desquamate from day 2 through 4. Male patients should be well aware of that.
- Shaving is allowed until scaling starts and should be interrupted in the presence of crusts. Shaving can be restarted after reepithelization is completed.

FAQs

What is the time that the glycolic acid should be left in contact with the male skin?

It depends on the indication. For acne and pseudofolliculitis barbae, the time should be around 1–3 min; for superficial hyperpigmentation from 2 to 4 min; and deeper hyperpigmentation or fine wrinkles from 4 to 8 min. However, focal frosting should be locally neutralized with water, and in the presence of severe erythema, the peel should be interrupted at any elapsed time.

What are the factors that may influence the chemical agent penetration into the male skin?

The factors that can cause deeper penetration of a chemical agent include the skin pretreatment with tretinoin and AHAs; shaving on the treatment day; defatting technique (acetone, repetitive, and aggressive scrubbing); very wet sponges, brushes, and cotton applicators; repetitiveness of application; and occlusion. On the contrary, the factors that slow the chemical agent penetration include increase in epidermal or photodamaged skin

thickness; increased sebaceous skin content, presence of scars, and location (glabella and nose).

What should be told to male patients after the AHA peel and what should be the frequency of repetition?
It is a peel indicated for skin conditioning and no real skin peeling or crusts are expected. The skin will be less oily and softer after the peel. The skin may be red and sensitive for about 2–3 days. For a quick response in skin conditioning, AHA peels should be repeated weekly. However, they may be indicated biweekly or monthly for male patients.

6.9.4 Medium-Depth Peels

Discomfort and pain is found during the application of medium-depth peels. It is advisable to count on oral sedation with benzodiazepines to alleviate anxiety in male patients. Nerve blocks, intramuscular or intravenous sedation may also be used to reduce pain, but are usually not necessary.

6.9.4.1 Jessner's Solution and TCA

Jessner's solution is applied with sable brushes and one coat is usually enough followed by 35% TCA, which may result in even frosting. In case of areas of unevenness, TCA should be reapplied carefully. Cold gel pack may be used to relieve the discomfort (Fig. 6.7).

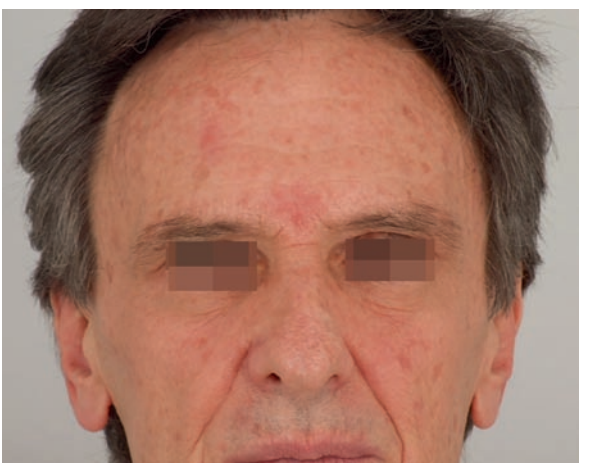

Fig. 6.7 Photodamage with actinic keratosis, solar lentigines, and seborrhoeic dermatitis. Although this patient would preferably benefit from a mid peel with the combination of Jessner's solution and 30% TCA, male patients usually prefer to be subjected to multiple light peels even if the response is not the same. Downtime is always an issue for male patients.

6.9.4.2 Glycolic Acid and TCA

Glycolic acid is applied to enable the penetration of the 35% TCA into the papillary dermis. No defatting agent is necessary, as 70% glycolic acid is left on skin for about 2 min and removed with tap water. A gauze pad with 35% TCA is then applied to the whole area. Cool packs are also used for pain relief.

6.9.4.3 Post Peel Phase

Erythema and edema start on the day of the application and the skin becomes brownish and there is crust formation. The skin becomes very dry and there is mild discomfort due to skin tightness sensation. The patient is allowed to wash the face and spray water whenever he feels the skin too dry. Petrolatum jelly (Vaseline®) or water-base lubricant (K-Y® jelly) can be applied on the skin to reduce dryness. K-Y® jelly is easier during application and removal; however, it dries out soon. K-Y® jelly may be "reactivated" by spraying water, though. Vaseline® is more consistent and needs fewer reapplications during the day and provides better covering. Some male patients tend to find it less pleasant to use. Ointments with antibiotics may be applied, although there are usually unnecessary.

Do's

- Do prescribe oral sedation with benzodiazepines to alleviate anxiety during medium-depth peels in male patients.
- Do indicate K-Y® or Vaseline® to treat the skin dryness during the first days.
- Do observe pruritus complaint. It may be due to contact dermatitis. Any post peel product in use should be discontinued.

Don'ts

- Do not continue the use of any petrolatum-based jellies if there is pruritus and acne formation.
- Do not overuse ointments due to the possibility of acne formation.

Key pointers

- The 50% TCA peel may cause skin texture change and hypopigmentation. The combined use of 35% TCA peels with either Jessner's solution or glycolic acid as a midpeel is much less risky.
- Healing may be accelerated by ointment base used since the day of the application of the peel.
- Some male patients tend to find less pleasant to use Vaseline® than K-Y® as a topical agent during the post peel phase.

6.9.5 Deep Peels

Before starting the phenol peel, it is important to hydrate and sedate the patient. The hydration is usually carried out with a total volume of 2,000 mL of lactated Ringer's solution distributed before, during, and after the procedure. Intravenous sedation (fentanyl citrate and midazolam, for example) is necessary and regional anaesthesia may also be employed with bupivacaine.

Adequate degreasing with acetone followed by alcohol is necessary in each cosmetic unit to produce an even peel. The application of phenol is carried out with moist cotton-tipped applicators. Depending on the severity of the skin alteration, a previous direct application onto the very deep wrinkles or acne scars may be undertaken. It is important to select the adequate frosting for each facial cosmetic unit, which may vary according to the skin problem. Very damaged areas should be treated more heavily, such as the perioral area, and the end point should be the gray-white frosting. Other regions, such as the periorbital area or those with moderate skin problems, may be treated with a single coat and the end point is the white color frosting.

Do's

- Do ask for blood and cardiac exams and verify the condition of the patient's liver, kidney, and heart before the phenol peel.
- Do hydrate the patient before, during, and after the phenol peel.
- Do extend the time for a full face phenol peel to more than 1 h.
- Do respect the elapsed time of 15–20 min between treating subsequent cosmetic units.
- Do differentiate the areas where a white or a gray-white color frosting is desired.

Don'ts

- Do not associate epinephrine with local anaesthetics during phenol peels due to possibility of increase cardiac arrhythmias.
- Do not rub the cotton tip onto the skin if you do not want to obtain the gray-white color frosting.

Key pointers

- Phenol is partially detoxified in the liver and excreted by the kidney.
- Phenol may induce cardiac arrhythmias.
- Intravenous hydration during and after the procedure is mandatory.
- Phenol is melanotoxic and can cause hypo or depigmentation.

FAQs

What are the exams that should be evaluated before the phenol peel?
Complete blood count, transaminases, creatinine, urea, electrolytes, and electrocardiogram.

What should be monitored during phenol peels?
Cardiac tracing (EKG), blood pressure, and oxygen saturation.

6.10 Wound Healing

Chemical peels should produce only partial-thickness wounds that will heal by second intention. Even deep chemical peels should not penetrate completely into the dermis. Reepithelization results from residual adnexal epithelium (hair follicles) or from the uninjured skin in the wound borders after the epidermal necrosis. The undamaged keratinocytes migrate to initiate the process of reepithelization that begins 24 h after the injury. Fibronectin, laminin, and platelet-derived growth factors stimulate the keratinocyte's movements that spread on a matrix consisting of fibronectin cross-linked to fibrin, collagen, and elastin. Water content in the wound bed influences the speed of cell migration. Medium-depth and deep-peel wounds heal better if the skin is hydrated. That is why removing crusts should be avoided.

On the second to the third day after the peeling, granulation tissue starts to be produced and remain until reepithelization is complete. It contains cellular components, including fibroblasts, inflammatory cells, fibronectin, glycosaminoglycans (GAGs), and collagen. Fibroblasts are the most important cells that produce collagen, elastin, GAGs, fibronectin, and proteases such as collagenase, which is fundamental for dermal remodeling. The GAGs are important for maintaining hydration to assist cell proliferation and migration. Endothelial cells migrate directly into the wound along the fibronectin matrix to supply oxygen and nutrients. The capillary ingrowth with the granulation tissue may explain persistent erythema after deep peels.

Collagen remodeling begins together with the granulation tissue and continues usually for 2 or 3 months after total reepithelization in medium and deep peels. It is responsible for the quality of skin texture after the peeling. In this phase, there is a balance between collagen formation and digestion by collagenase. Neovascularization regresses and the skin becomes less sensitive and red.

Do's

- Do observe skin hydration in the after-peel period. Dry skin may interfere with cell migration.

Don'ts

- Do not remove the crusts. It can impair the healing process and provoke postinflammatory hyperpigmentation.

Key pointers

- Previous use of isotretinoin or prior radiation treatment interferes with follicle unit density, which may retard the wound healing process.

- Male patients should wait 6 months after the last dose of isotretinoin to be subjected to deep peels.

FAQs

Is it possible to use glycolic acids peels if the male patient is still in use of isotretinoin?
Yes, it is possible to associate glycolic acid peels or any peel that does not reach the epidermal–dermal junction. They are helpful to accelerate the healing of acne lesions.

6.11 Complications

Any chemical peel may lead to complications. Superficial, medium-depth, and deep peels may present with specific complications after the treatment. However, there are complications that may be found in any type of chemical peel, such as pigmentary changes.

6.11.1 Hyperpigmentation

It is a common feature found in male patients owing to the irregular use of bleaching agents and sunscreens after the peel. Superficial and mid peels are commonly the inducer of post-peel hyperpigmentation. Especially during the erythematous phase, minimal sun exposure may lead to post-inflammatory hyperpigmentation. Very superficial peels hardly lead to this kind of complications due to the absence of inflammation.

Patients with lighter skin complexion (Fitzpatrick I to III) have lower risk to develop hyperpigmentation. In contrast, darker complexions should be peeled with extreme care. The darker the skin is, the more superficial and less inflammatory the chemical agent should be (Nikolaou et al. 2006).

There are some topical agents and drugs that are potential photosensitizers. Below you may find a list of the most common photosensitizers:

- Antibiotics: fluoroquinolonas (levofloxacin), tetracyclines, sulphonamides
- Antifungals: griseofulvin, terbinafine, itraconazole, voriconazole
- Diuretics: furosemide, thiazides
- Neuroleptics: phenotiazines, chlorpromazine, thioxanthenes
- Nonsteroidal anti-inflammatory drugs: ibuprofen, ketoprofen, naproxen, piroxicam, celecoxib
- Hypoglicemics: sulfonylurea
- Retinoids: isotretinoin, etretinate, acitretin
- Psoralens
- Sunscreens: para-aminobenzoic acid (PABA), cinnamates, benzophenones, salicylates.
- Fragrances: musk ambrette, 6-methylcoumarin.

- Other drugs: 5-FU, amiodarone, diltiazem, quinidine, hydroxychloroquine, coal tar, enalapril, dapsone, oral contraceptives

The treatment of post-peel hyperpigmentation includes home-use daily creams with bleaching agents and acids in low concentration. Peels with lactic acid and Jessner's solution are also good options for the treatment of hyperpigmentation in male patients (Sharquie et al. 2006). Recalcitrant hyperpigmentation may benefit from serial glycolic peels and home care creams (Erbil et al. 2007).

Do's

- Do investigate the use of photosensitizing drugs and topical agents before indicating any peel for male patients.

Don'ts

- Do not allow any male patient have irregular use of sunscreen. Any effective bleaching treatment needs effective photo protection.

Key pointers

- Hyperpigmentation is a common feature found in male patients, due to irregular use of bleaching agents and sunscreens after the peel.
- Avoid regional or local deep peels in male patients. Demarcation lines are frequent and only the use of make up can disguise them.

FAQs

What peels are more likely to cause hyperpigmentation and what is the most frequent phase it may happen?
The superficial and specially the medium-depth peels are more likely to induce hyperpigmentation. It happens mainly during the erythematous (inflammatory) phase in the months after peeling.

Is hyperpigmentation a frequent adverse event found in male patients after chemical peels?
Yes.

What is the treatment for postpeel hyperpigmentation in male patients?
There are many formulations that must include an acid in low concentration and a depigmenting agent. The classical is topical tretinoin 0.025–0.05% and hydroquinone 2–4%. Other options include 10% glycolic acid and 2–3% kojic acid. Hydrocortisone 1% may be added in both formulas. It must be stressed that photoprotection is mandatory.

6.11.2 Hypopigmentation

It results from a decrease on the melanin deposits and should be differentiated from depigmentation which results from the absence of local melanin synthesis from the melanocytes. Both may be considered a serious problem for male patients who are not keen on applying make-up and cover foundations. Hypopigmentation is mostly found after Baker's phenol peels. Deep peelings tend to remove several skin layers and the melanin deposits that have been produced for years of sun exposure. Although, the hypopigmented skin is quite similar to the color of nonexposed skin areas, the contrast between the peeled and the untreated area is really inconvenient for male patients. Suntanned male patients should be avoided for medium to deep peels without skin treatment before the application. Demarcation lines are more common in patients with Fitzpatrick IV, V, and VI type.

FAQs

What is the difference of hypopigmentation and depigmentation?
Hypopigmentation is a reduction in the skin color tone due to removal of melanin deposits and to decrease of the number of melanocytes per mm^3 after the peeling. Depigmentation is complete absence of melanin like those found in vitiligo. It results from impairment of melanin synthesis due to chemical toxicity against the melanocytes.

When can the extension of hypopigmentation be correctly diagnosed?
When erythema subsides, it is more evident in the line of demarcation between the treated and untreated area.

What can be done to minimize the demarcation line?
For full face mid and deep peels, the chemical agent should be feathered at the line of natural shadowing along the mandible, so that there is no evident contrast at the transition zone between the treated and untreated areas. Regional deep peels should be avoided in male patients.

In case of hypopigmentation, is it possible to apply camouflage makeup for male patients?
Yes, it must be very subtle, though. Male patients should be properly orientated for the use of camouflage makeup, which initially most of them will refute.

6.11.3 Scars

Deep peels have higher risks of scarring than medium-depth peels. Superficial peels are least likely to scarring due to lack of penetration into the dermis. Extensive dermis injury and reepithelization impairment lead to scarring. There are contributory intrinsic aspects, including heredity, darker skin types, and extrinsic aspects such as smoking, inadequate hydration, previous cosmetic surgery, dermabrasion, peels, and isotretinoin use.

Do's

- Do indicate only weaker superficial peels in male patients with history of keloids if they have formal indication for them.

Don'ts

- Do not indicate medium and deep peels in male patients with a history of keloids.

Key pointers

- 35% TCA is relatively safe.
- 50% TCA is more caustic than full-strength phenol and is more likely to produce scarring.
- Scratching should be avoided due to constant reepithelization impairment and the possibility of resulting in scarring.
- The most likely site for scarring with a deep peel with phenol is in the perioral area.
- Areas such as the neck, hands, forearms, and arms are more prone to scarring.

FAQs

What should be done if hypertrophic scarring occurs after peeling?
Aggressive early treatment with topical or intralesional steroids, silicone sheeting, pressure application, massage, dermabrasion, laser, or ultimately scar excision.

6.11.4 Infections

Post-peeling infections are rare but should never be ignored. Herpes simplex may be reactivated by peeling of any depth. Any postpeel pain should indicate the onset of viral infection (usually herpetic activation). The antiviral agent acts by inhibiting viral replication in the intact epidermal cell. For this reason, the antiviral agent should be prescribed for at least 10 days in medium-depth peels and for 2 weeks in deep peels (Monheit 1995). Secondary infection with *Streptococcus*, *Staphylococcus*, or nosocomial *Pseudomonas* is also rare. All delayed healing and secretion with occlusive dressing must have candidiasis (yeast) investigated and treated.

Do's

- Do apply soaks continuously to debride crusting and necrotic material. That is quite helpful to avoid infection.

Don'ts

- Do not perform any peel, even the light ones, in the presence of an active herpes infection.

Key pointers

- Male patients with previous history of herpes to be subjected to medium-depth to deep peels are candidates for prophylactic use of 400 mg acyclovir three times daily or 500 mg of valacyclovir two times daily. Begin 2 days prior and continue 7–14 days after the peel.
- Acetic acid (vinegar diluted into water) washes are also helpful to debride necrotic material and prevent Pseudomonas infections.
- Milia (inclusion cysts) may appear after 2–3 weeks after the peel and may be regressed spontaneously or removed by needle extraction.
- Acne may occur immediately during or after reepithelization. It may result from over greasing topical agents, which should be discontinued. As it may cause scarring, they should be aggressively treated and oral antibiotics should be prescribed. In resistant cases, low-dose isotretinoin for 3–6 weeks should be considered.

6.11.5 Persistent Erythema

As a rule, the deeper the peel is, the higher the stimulation for neoangiogenesis and the longer the erythema will be. Erythema in very superficial peels may last for 2 or 3 days. Superficial peels may last 15–30 days (unusual), medium-depth from 30 to 60 days, and deep peels up to 3 months. Intermittent flushing may occur after 2–4 years after deep peelings, but it is unusual. Pruritus is common after reepithelization, however; if it is present during healing process, contact dermatitis to any topical products should be investigated.

Do's

- Do prescribe camouflage cosmetics with a green foundation. They are the most effective to mask the intense erythema after peel.
- Do a pretest of camouflage in male patients to check if they will cope with it without stress.

Don'ts

- Do not leave male patients alone for makeup use. Have a staff member to assist him during the first applications.

Key pointers

- Male patients do not tolerate erythema even from medium-depth peels. They should be encouraged to use a foundation for self-comfort.
- Topical hydrocortisone lotion and oral antihistamines may be helpful in controlling erythema and pruritus.
- Excessive alcohol ingestion increases the risk of persistent erythema.
- Atrophy may occur after many deep peels with phenol on normal thickness skin or after application on very thin and non-sun damaged skin.

FAQs

What are the reasons for persistent erythema after peel in male patients?
The use of tretinoin, isotretinoin, and excessive alcohol ingestion before and after peel. Persistent erythema is also found in atopic patients and patients with rosacea.

Are enlarged pores treatable with chemical peels?
No. They may even worsen or result from medium-depth to deep peels. Luckily, it is a temporary feature.

The top 10 key pointers

- The collagen skin content and sebum production is higher in male patients. Thick sebaceous skin may lead to uneven peeling unless effective degreasing is carried out.
- If male patients do not tolerate skin pretreatment with topical creams, they will probably not use regularly the postpeel bleaching agents and sunscreen, that may lead to postpeel hyperpigmentation. So, the choice of the peeling must be made accordingly.
- Glycolic acid peels are effective for the treatment of active acne and for controlling pseudofolliculitis barbae. Acne pustules and comedones open and heal more rapidly. Salicylic peels are very adequate for male patients, especially for the treatment of folliculitis in the arms and back.
- Medium-depth or deep peels are suitable for acne scars. Give preference to combined Midpeels due to lower risk of hypopigmentation in male patients.
- The treatment of hyperpigmentation in ethnic dark-skinned male patients with chemical peels should be handled only by experienced practitioners.
- Male patients tolerate more water-based jelly than ointment creams in the first days after the peeling.
- After superficial peels, male patients may carefully shave on the following day with electrical razors and blades if the skin is not too sensitive.
- Laser hair removal is a very good option before medium-depth and deep peels. One or two sessions will usually suffice. A 15-day interval from the last session is advisable.
- Demarcation lines are a serious problem in male patients who are usually hesitant to camouflage makeup. So, avoid suntanned male patients and regional deep chemical peels.
- Male patients do not tolerate erythema even from medium-depth peels. They should be encouraged to use a foundation for self-comfort. Topical hydrocortisone lotion and oral antihistamines may be helpful in controlling erythema and pruritus.

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Lasers

7

Maurício de Maio

7.1 Introduction

Cosmetic procedures for men have been steadily increasing. Besides surgical procedures, several laser treatments are performed on men. The reason is that many of these procedures have a minimal associated recovery time. Frequently, male patients are unwilling to take time off from their schedules for cosmetic treatments.

Laser and IPL systems have been widely used for many indications in male patients (Fig. 7.1). Acne scars and wrinkles have been treated with ablative lasers such as CO_2 and erbium. Vessels, port-wine stains, hyperpigmented spots, and tattoos have been treated with high efficiency and few adverse events due to the development of precise equipments with minor lateral thermal damage (Figs. 7.2a, b). Many men who are chronically tanned are not keen on applying sunscreen on a regular basis. The excessive pigment compromises the treatment options for some lasers and IPL devices. It is important to educate the male patient regarding the mechanism of action and rationale for laser treatments. It may require a period without sun exposure and regular use of sunscreen before a male patient may be subjected to any laser or IPL treatment.

7.2 Lasers

There are multiple technologies available for the treatment of photoageing and static wrinkling. There are two categories of lasers used for skin resurfacing: the ablative and the nonablative systems.

7.2.1 Ablative Resurfacing

Ablative systems are those that remove skin layers by exfoliation or coagulation. erbium:yttrium–aluminium–garnet (Erbium:YAG) lasers exfoliate the skin and present no hemostatic property due to minimal lateral thermal injury with less healing time (4–5 days

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Fig. 7.1 A typical male oily skin with large pores, sebaceous hyperplasia, and acne scar. Chemical peel or laser treatment is advisable. Male patients may opt for multiple light chemical peels for skin conditioning and skin texture improvement. Women would generally ask for a complete skin resurfacing treatment.

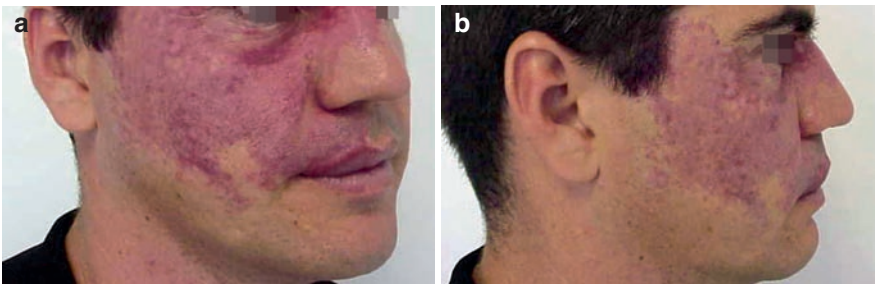

Fig. 7.2 (**a**) Male patient with port-wine stains on the face. Before laser and IPL systems, the treatment options were restricted. (**b**) After four sessions with 532 nm Nd:YAG laser, a decrease in the vascular structures and some of the tuberous lesions are evident.

compared with 1–2 weeks seen with CO_2 lasers). CO_2 pulse lasers, on the contrary, present enough thermal injury that enable vessel coagulation and create more lasting and noticeable results than any other system.

7.2.2 Carbon Dioxide Laser

Carbon dioxide laser resurfacing frequently yields the most dramatic results. Unfortunately, it has the longest recovery period with prolonged erythema for weeks and sometimes months after the procedure. Male patients are in general unwilling to use cosmetic products to camouflage any residual redness. For this reason, it is not well-accepted by men (Figs. 7.3a, b). Another drawback with CO_2 lasers for male patients is the complicated

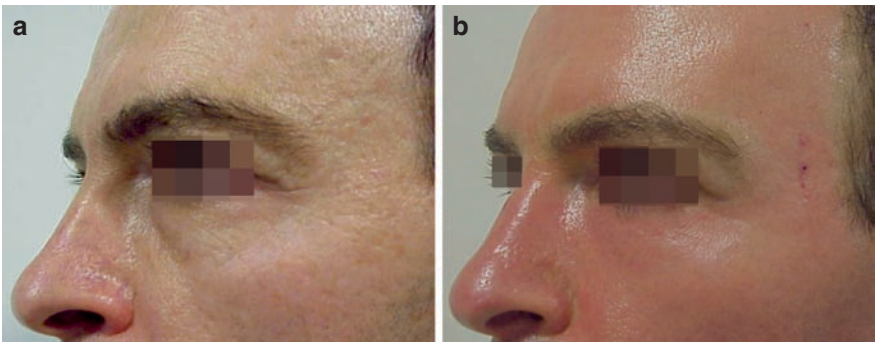

Fig. 7.3 (**a**) Patient with oily skin, large pores, and ice-pick acne scars. There is also skin excess in the upper and lower eyelids. (**b**) After 15 days of laser resurfacing and lower eyelid bag removal by CO_2 laser, the skin is still red but its aspect is amazing. Unfortunately, because of a long downtime and risk of adverse events, CO_2 resurfacing has drastically decreased.

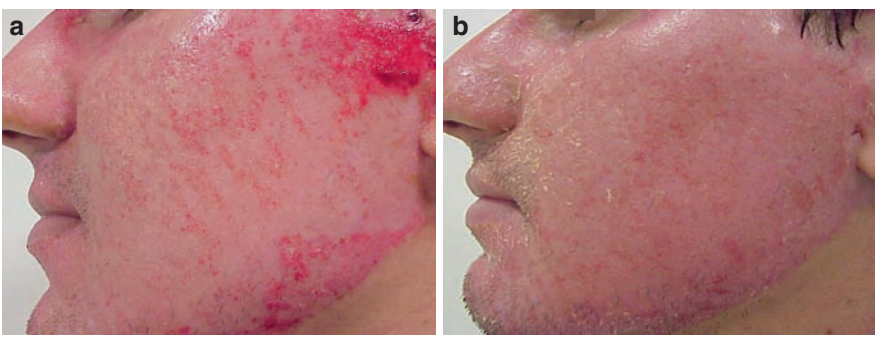

Fig. 7.4 (**a**) Wound healing process 7 days after CO_2 laser resurfacing. Reepithelization is still incomplete. Note that owing to more density of adnexal structures in the central part of the face, reepithelization occurs from the mid towards the lateral aspect of the face. (**b**) After 15 days, reepithelization is completed and erythema and the transition line are still evident. The patient is allowed to shave now.

postoperative phase (Figs. 7.4a, b). The need of intense skin care, debris, and crusting removal may be quite disturbing for male patients (Fig. 7.5). Carbon dioxide lasers are very effective, though. It is still one of the best methods for skin rejuvenation and to treat scarring caused by acne (Figs. 7.6a, b–7.8a, b). An alternative for male patients is the use of only a single pass that produce skin vaporization, collagen shrinkage, but little skin tightening. The swelling and redness will be shorter-lasting. To facilitate the postoperative period for male patients, the remains of the thermal lesion are not removed and the treated areas are not wiped with wet gauze. The epidermal debris is left intact as a biological dressing (Chajchir and Benzaquen 2005). The associated complications with CO_2 lasers

Fig. 7.5 Male patient subjected to CO_2 laser resurfacing. The beard can be shaved only when complete reepithelization has occured, which is usually after 15 days. Edema has improved by that time but erythema will still persist for 2–3 months.

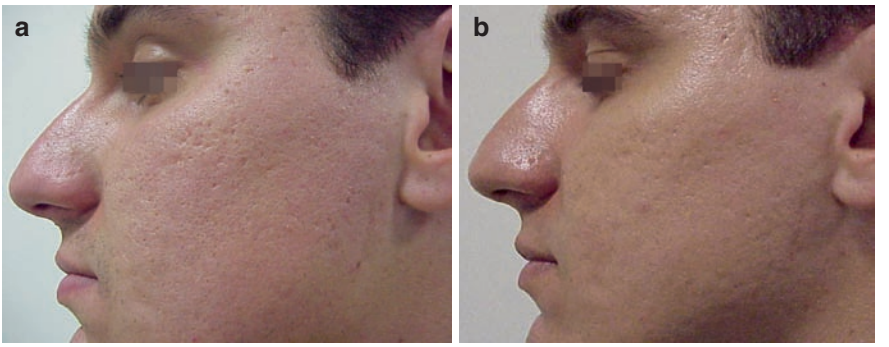

Fig. 7.6 (**a**) Acne scar before the treatment with CO_2 laser resurfacing. (**b**) Five months after the treatment and there is no evidence of transition line between the treated and untreated areas.

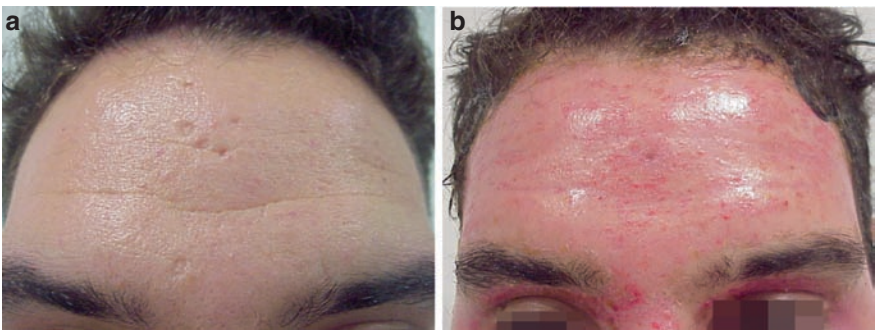

Fig. 7.7 (**a**) Very deep and rounded acne scar in the forehead. Please note that any type of deep skin resurfacing alone is unable to be corrected. (**b**) Five days after CO_2 laser resurfacing and subcision below the deep acne scar.

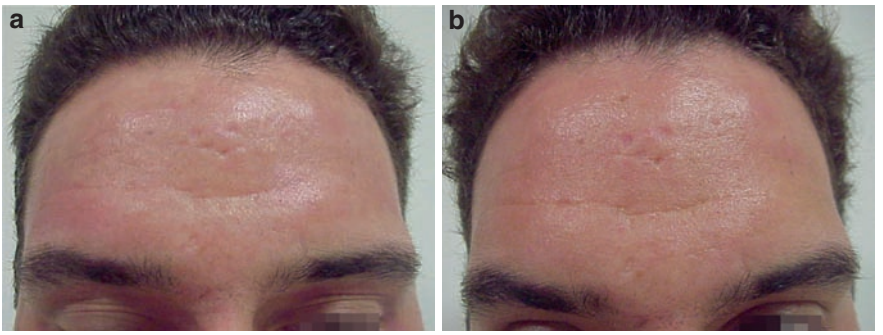

Fig. 7.8 (**a**) After 20 days, the severe acne scar starts to reappear. (**b**) After 40 days, some of the scars are more superficial and less evident. After the whole postoperative period is over, injectable fillers should be considered to improve the deeper scars.

Fig. 7.9 Hypochromia and a visible transition line are found after deep chemical peels or ablative lasers. This patient was subjected to CO_2 laser resurfacing and the skin hypopigmentation was still evident after 2 years.

include prolonged postoperative erythema, infection, hyperpigmentation, dermatitis, hypertrophic scarring, and hypopigmentation (Fig. 7.9).

Rhinophyma is a disturbing condition for male patients as such that they would accept a treatment even with a long recovery time. Scalp reduction and lasers have been used to treat this condition. Carbon dioxide laser resurfacing is very effective for reducing rhinophyma. Reepithelization is ensured by the high amount of restoring pilosebaceous units. Care should be taken not to deepen excessively, though. The greatest advantage of CO_2 lasers over other methods is that it is hemostatic. This differentiates it from erbium lasers, dermabrasion, or scalp reduction, where bleeding is common and makes the procedures difficult to perform. Bipolar radiofrequency is a less expensive alternative for the treatment of rhinophyma.

7.2.3 Er:YAG Laser

The Er:YAG laser is another ablative laser that can be used to treat photoageing and superficial wrinkles. The Er:YAG laser causes less adjacent thermal injury than the CO_2 laser, enabling a quicker healing and a shorter recovery time. Superficial resurfacing reduces hyperpigmentation and improves skin texture (Avram and Goldman 2004). Bleeding and enlargement of pores denote deepening to midpapillary dermis and they may be considered a good landmark for the end-point of Er:YAG laser resurfacing. Superficial resurfacing results in pinkness for about 3–4 days while deeper ones may last from 6–10 days. There is also a reduced incidence of delayed hypopigmentation when compared with the CO_2 lasers (Fleming 1999).

Er:YAG lasers are adequate to reduce surface scarring irregularities, either from trauma or acne. It is associated with a shorter recovery time, which is much more acceptable to male patients. Among all the indications that male patients may benefit from ablative lasers, scarring caused by acne may be considered the number one. When evaluating a male candidate for this procedure, the degree of severity must be evaluated. Mild and severe acne scarring should be outweighed concerning the benefits in mild cases, and little or no improvement in severe cases. Ablative lasers show the best performance in moderate cases (Apfelberg 1997). Moderate scars characteristics include superficial irregularity, blotchy pigmentation, and diffuse, shallow, saucer-like indentations of atrophic scars. Some deep ice picks scars of small diameters with steep sides may also be treated with very good results

Do's

- Do mark out the indentations of acne scars first before injecting the local anaesthetic.
- Do the first passes around the "shoulders" of the indentations followed by uniform passes in the whole area just to the level of bleeding.

Don'ts

- Do not indicate CO_2 laser for male patients with darker skin complexion due to the high risk of hypopigmentation.

Key pointers

- CO_2 lasers are not popular among male patients due to prolonged erythema.
- A single pass of CO_2 laser is more accepted by male patients due to shorter lasting swelling and edema.
- Er:YAG lasers yield superficial resurfacing and shorter downtime which is more acceptable for male patients.
- If a male patient with darker skin complexion is to be subjected to an ablative resurfacing method, due it with Er:YAG.
- Scarring caused by acne is the number one indication for the use of ablative lasers for male patients.

FAQs

Why CO_2 lasers are not popular among male patients?
Although CO_2 lasers may promote the most effective result for the treatment of acne scars and severe photoageing, male patients tend not to accept them due to the prolonged downtime and the need of intense skin care after the procedure. In the first weeks or months, there is erythema that needs to be covered up with makeup. Another aspect is the possibility of an evident permanent whitish transition line between the treated and nontreated area

How should ice picks be treated with ablative lasers?
Ice pick scars respond well by drilling a small diameter hole to the bottom of the scar with laser and allowing healing by secondary intention.

7.2.4 Nonablative Skin Rejuvenation

In the past few years, the focus has shifted toward the use of less invasive nonablative laser and light treatments. Photorejuvenation (nonablative resurfacing) targets the improvement of skin texture and tone, wrinkles and surface irregularities, dyspigmentation, erythema, and telangiectasia without visibly disrupting the epidermis (Alam and Dover 2003). These systems are even more attractive for male patients, because it results in little or no downtime, which is an advantage for them. On the other hand, multiple treatments are required, and optimal results may not be seen for several weeks after the last session and skin improvement is not as dramatic as those seen with ablative resurfacing.

Nonablative systems available include KTP laser (532 nm), pulsed dye laser, Nd:YAG (1,064 nm), diode lasers, Er:glass laser, among others. Intense pulsed light (IPL) devices have become very popular for use in facial rejuvenation, due to the treatment of telangiectasia and erythema, reduction of lentigines, and softening of facial static lines and creases. IPL devices target melanin and hemoglobin and stimulate the formation of collagen and elastin.

Nonablative lasers are used to heat the dermis and stimulate collagen production. Skin thermal denaturation is dependent linearly on exposure time and exponentially on temperature. This means that cell death is exquisitely sensitive to temperature and not as much to time (Jaques 1992). Nonablative devices may need cooling devices to reduce the temperature impact on epidermis. There are three basic types of cooling: sapphire contact, cold air, and cryogen spray. The most commonly used are the 1,450 nm with a cooling spray and the 1,320 nm with cooling spray system. They can also be used to reduce acne scarring and have minimal associated recovery time. For any of the above indication, multiple treatments are required to obtain an effective result. As these lasers target the dermis, it is advisable to combine treatments that focus on the epidermis, such as superficial or mid peels, if needed (Carniol et al. 2005). Devices that do not present any visible skin reaction should be evaluated in a different way. Usually, the end point is localized transient skin warming just below the pain threshold. No aesthetic is applied, thus ensuring that the patient will provide feedback regarding excessive temperatures. Many wavelengths can be

made to heat the papillary and reticular dermis with the proper mixture of fluences, repetition rates, epidermal cooling, and pulse duration (Goldberg 2002).

7.2.5 Skin Tightening

Skin tightening procedures that do not involve surgery can be appealing to men. The use of infrared devices has been increasing for this purpose and may be helpful for male patients who present mild-to-moderate skin laxity. Although selective dermal heating may be achieved with deeply penetrating mid IR lasers combined with topical cooling, the zone of heating in the dermis will always be broader and deeper than the fine band of thermal denaturation observed with Er:YAG and far IR lasers. There is a precise complete denaturation of a thin skin layer observed after typical short-pulsed CO_2 and Er:YAG resurfacing.

7.2.6 Wrinkles

Static wrinkles may be improved by a variety of IPL or lasers devices. Despite the various modalities used in selective dermal healing, the degree of wrinkle improvement is not as good as that for Er:YAG and CO_2 lasers. Selective dermal heating and wrinkle improvement can be obtained with long-pulsed PDL devices through primary heating of vasculature and the release of inflammatory mediators. The localized heating in small capillaries may lead to new collagen deposition. Short-pulsed (0.3–50 ms) low-fluence Nd:YAG lasers promote a gentle sequential dermal heating that might stimulate new collagen deposition, tighten skin, reduce inflammation, and reduce pore size (Taylor and Prokopenko 2006).

Key pointers

- Nonablative lasers are very suitable for male patients: No downtime; however, it requires a series of treatment to obtain the maximum benefit.
- Skin-tightening procedures with infrared or radiofrequency technologies appeal more to male patients than surgical facelifts even when the result is limited.
- In choosing a laser or IPL for full face and neck rejuvenation, the pulse configuration should achieve maximal deferential heating between the epidermis and the dermal vessels. Longer pulses or pulse trains will target more the vessels than the epidermis.
- Depending on the physical characteristics of the subablative IPL or laser devices, male patients may experience too much pain during the irradiation at the beard area and refuse to continue the treatment.
- Some male patients may accept to be subjected first to 1–2 sessions of laser or IPL hair removal on the face and then to subablative treatments with less pain.

7.3 Fractional Technology

Traditional ablative technologies, although very effective, are particularly challenging in the male patients, as prolonged recovery time including persistent erythema is undesirable and men do not traditionally wear make up to camouflage skin. Lines of demarcation make ablative technologies not ideal for treating isolated areas or segmental areas. In addition safety is a concern when treating nonfacial skin with ablative technologies. Nonablative fractional resurfacing allows for safe skin resurfacing in all skin types, anatomic locations, and segmental and isolated areas. It presents a very effective modality of skin resurfacing in men because of its efficacy, reduced recovery time, and long-term duration.

Fractional laser systems have been developed to try to solve the challenge of nonablative lasers that either damage the epidermis or overcool the superficial dermis with the cooling system and promote no effective result. Optimal superficial heat confinement is obtained with a highly water-absorbing mid IR lasers, and that may provoke the aforementioned discrepancy. Most devices use water as chromophore. Fractional photothermolyis can be achieved with nonablative (NFSR) and ablative modalities. The former is the most widely used and preferred by male patients.

Nonablative fractional resurfacing works threefold: (1) by nonablative mode of tissue coagulation with the stratum corneum remaining intact with no tissue vaporization; (2) by the creation of multiple microthermal zones surrounded by islands of viable tissue; and (3) by the extrusion and replacement of damaged tissue with reepithelization within 24 h. The use of appropriate wavelengths and depths of penetration enable collagen remodeling and creation of microthermal zones of rapid reepithelization. The chromophore for fractional photothermolysis is tissue water with targets being epidermal keratinocytes, dermal collagen, and dermal vascular structures (Manstein et al. 2004).

Fractional lasers produce macro- and microwounds. The microwounds are of 75–150 μm wide with densities ranging from 100 to 1,500 microwounds cm^{-2} in the skin (Narurkar 2007). Usually, the total surface areas involved tend to range from 15 to 30% per session. Some fractional CO_2 laser systems create 125 μm diameter ablative wounds as deep as 1 mm and promote immediate superficial skin tightening. The macrowounds created by fractional technologies are greater than 300 μm in diameter and include KTP laser with a scanner and the active FX CO_2 laser system. The former creates approximately 700 μm wounds and the latter creates an array of approximately 1 mm wounds. Around 60% of the surface area is covered per session.

To compare the fluence differences among laser systems, the Nd:YAG laser with 1,440 nm deliver microbeams uniformly at low fluences from 3 to 7 J cm^{-2}, while fractional CO_2 and Er:YAG laser may reach higher fluences from 50 to 200 J cm^{-2}. The nonablative Nd:YAG laser produces erythema for no more than 12 h and the Er:YAG may result in immediate water loss, severe postoperative discomfort, and pinpoint bleeding is often observed (Jaffe and Walsh 1996). Pain may be controlled with topical anaesthetic or refrigerated air, which decreases the skin heating without interfering with the microwounds effects. The 1,550 nm Fraxel laser produces random patterns of microthermal zones and there is a 1,540 nm fractional laser that produces a stamped pattern. The former may reach up to 1,360 μm of skin

penetration and the fluence and the range of microthermal zones can be adjusted. Safer treatments in different skin types can be obtained by adjusting the fluence and density. Male darker skin can be treated safely with lower treatment levels.

Ablative fractional resurfacing includes the 2,940 nm Er:YAG device. The rationale for ablative fractional devices is to reduce the number of treatments, compared with nonablative fractional devices and even still, it maintains greater safety when compared to traditional CO_2 and Er:YAG lasers. Male patients seem to have a faster recovery from edema and erythema, in part to greater epidermal and dermal thickness and larger sebaceous gland percentage when compared with women.

It is advisable to start topical creams with tretinoin and hydroquinone prior to NFSR. Male patients are usually not tolerant to skin home care. To improve the performance of the nonablative resurfacing, a minimum period of 4–6 weeks prior to the treatment is advisable. Topical tretinoins should be stopped 5–7 days prior the resurfacing to reduce blistering.

A great advantage of fractional lasers for male patients is the possibility of segmental treatment without the risk of permanent lines of demarcation. Not all IPL sources may be performed in the beard area, as unwanted hair reduction can ensue, giving a patchy appearance. In contrast, fractional lasers are safe to treat in the beard area and may be considered the first option for pigmented lesions.

Do's

- Do provide pain control for male patients who will be subjected to fractional lasers with either topical anaesthetic, oral medication, or ideally both.
- Do perform lower treatment levels with fractional lasers in male patients with darker skin complexion.
- Do prevent herpes simplex reactivation in male patients with a previous history of infection who will be subjected to fractional or ablative lasers.

Don'ts

- Do not use the same parameters in men as those applied for women for fractional treatments. Male patients usually require higher fluences for the same indications.
- Do not forget that severe acne prone patients should be treated with oral antibiotics prior and post laser fractional treatments.

Key pointers

- Reducing downtime and improving the quality of the recovery phase is critical for male patients.
- Nonablative fractional resurfacing is widely more accepted by male patients than ablative modalities.
- A great advantage of fractional lasers for male patient is the possibility of segmental treatment without the risk of permanent lines of demarcation.
- Common indication for fractional lasers for male patients include the treatment of acne scars, facial photodamage, and surgical or trauma scars.

- Fractional lasers are safe to be applied in the beard area. Unwanted hair reduction is not present as it is with pulsed light sources.
- Male patients present a faster recovery from edema and erythema when compared to female patients. This may be due to a larger percentage of sebaceous glands and greater epidermal and dermal thickness.
- Any reduction in edema and erythema is very important for male patients who are usually uncomfortable to wear make-up and camouflage.

FAQs

How should solar elastosis and acne scars be better treated with fractional lasers in male patients?
For both solar elastosis and acne scars, the treatment should be undertaken with deeper microwounds with lower density and multiple sessions.

What is the difference between the ablative and fractional wound healing?
Fractional wounds tend to heal with less discharge with a less conspicuous recovery due to the fact that fractional photothermolysis counts on untreated tissue to accelerate wound healing.

How can edema and erythema be reduced in male patients subjected to skin resurfacing?
By interrupting any irritating topical agent such as topical tretinoin and stimulating uninterrupted use of sunscreen. Another effective maneuver is to apply low intensity lasers such as 590 nm LED.

What is the average number of sessions for nonablative fractional lasers for male patients?
Three to five treatments sessions with 1 month interval are ideal for most indications. The average downtime for male patients is 48 h.

What are the complications with nonablative fractional resurfacing?
Occasional blister, transient postinflammatory hyperpigmentation, and petechiae.

7.4 Radiofrequency and Light

Male skin tightening may also be achieved through deeper heating with long pulses. Most deep-heating devices are time- and temperature-dependent. A focal fractional damage on collagen fibres is the principle of the skin tightening. A low grade inflammation after the procedure leads to softening of jowls and melolabial folds. As the skin tightening may be delayed or even modest, precise counselling should be given to male patients. Otherwise, disappointment and dissatisfaction are frequent with the treatment.

Radiofrequency (RF) may be monopolar or bipolar. Deep heating may also be produced by halogen lamps or xenon flashlamps. Heat generation with monopolar RF depends on local

tissue resistance and current resistance. The orientation of the positive and negative electrodes should be relative to skin anatomy. To heat a large volume of skin, a monopolar electrode larger than 1 × 1 cm should be used so that the current is directed fairly uniformly in the dermis and the effect tends to be deep. When bipolar electrodes are integrated into the contact tip, current density tends to flow superficially and temperature is confined to superficial skin. The depth and intensity of heating may be controlled by manipulation of electrodes.

Bipolar RF may be combined with light to optimize efficacy and safety. Lower optical energies are used to selectively heat sub-surface targets and the RF device increases exponentially the temperature through subsequent electrical pulses (Sadick and Sorhaindo 2005). The halogen lamp is an optical alternative to RF (Titan™). It uses a cycle of precooling, heating, and postcooling to generate a layer of selective dermal healing about 800–15,500 μm deep in the skin. It is a device that produces deep wounds (Dierickx 2006). Early rare complications with the first devices have now been properly eliminated; fat atrophy was the worst one (Weiss et al. 2006).

Do's

- Do use a layered approach, starting with the deepest tightening procedure, followed by a visible light device, and finally a fractional or superficial resurfacing procedure.

Don'ts

- Do not forget to combine therapies with light to obtain a higher performance of result and that can be undertaken in the same session.

Key pointers

- As the skin tightening may be delayed or even modest with radiofrequency, precise counselling should be given to male patients. Otherwise, disappointment and dissatisfaction are frequent with the treatment.

FAQs

What are the most common complications of nonablative skin rejuvenation in male patients?
Most complications are associated with excessive fluences in tanned or darker-skinned male patients when using visible light for the treatment of vessels or hyperpigmented spots.

7.5 Acne and Scars Treatment

The vast majority of male patients respond well to topical medication and chemical peels for acne. For those nonresponders, either from a "biological" point of view or due to simply lack of behavioral compliance, lasers, light, or photodynamic therapy are a good

solution (Taub 2004). Subsurfacing devices such as the 1,450 nm laser are very useful to reduce size of sebaceous hyperplasia (No et al. 2004).

Red scars, either from trauma or surgery, may be treated by IPL, PDL, and Q-switched Nd:YAG laser (Alster and Tanzi 2003). The aim of the treatment is the reduction of the neovascularization that is present in red or hypertrophic scars. Old white scars may be treated by IPL and lasers as long as they are stimulated by to become red and immature again. The pretreatment of topical retinoids or AHA is very useful for that. The redder the scar is, the more effective the treatment with IPL and laser will be.

Old white acne scars can be classified into three types that include the ice pick, rolling, and boxcar (Jacob et al. 2001). Ice picks are sharply demarcated holes that deepen into the reticular dermis and subcutaneous. Rolling scars are usually wider than 4–5 mm and stem from tethering of otherwise normal looking skin, and box scars are depressions with sharply demarcated vertical edges. Ice-picks may be treated with skin tightening procedures, although the result may be disappointing. More superficial ice-picks scars present good results with fractional approaches as well as the boxcar scars. The best results are achieved with high densities (20–30% surface area per treatment) and deep wounds.

Do's

- Do apply topical tretinoin to old scars. When they become red, treat with IPL, PDL, or KTP.

Don'ts

- Do not worry if there is ulcer or crust formation on the scar after Laser or IPL treatment. Reepithelization will be slower than in normal skin.

Key pointers

- Male patients may be resistant to use adequately topical medication against acne. Laser, light, or photodynamic therapy are very good alternatives.
- Sebaceous hyperplasia in male patients can be properly treated with 1,450 nm lasers.
- Be careful with black-haired areas in male patients and Nd:YAG lasers for the treatment of acne scars.

FAQs

Can Q-switched Nd:YAG lasers be applied in male patients for the treatment of acne scars?

Yes. Male patients may be subjected to the treatment of Q-switched Nd:YAG laser for the treatment of acne scars. The endpoints are the presence of erythema and fine punctuate petechiae. Pulses over hair bearing areas may be more painful. Although there is no concern with permanent hair reduction, and longer pulse systems should be avoided in black-haired areas.

What is light biostimulation?
It is the modulation of organelle function. The indications include wrinkle reduction, suppression of acne, and inflammation reduction. Low power densities from 10–100 mW cm^{-2} are applied through red, blue, yellow, or IR light. It is said to modulate wound healing and collagen deposition. Treatment is carried out once or twice a week over 3–6 weeks. Clinical outcomes are often modest.

7.5.1 Hemoglobin and Melanin

Hemoglobin and melanin are the primary absorbers for wavelengths ranging from 520 nm to 800 nm. Depending on the type of pigment or vessels to be treated, the correct device should be used. For discrete smaller (0.1–0.6 nm) telangiectases, the devices that can be used include the pulsed dye laser (PDL), the potassium titanium oxide phosphate (KTP) laser, or intense pulsed light (IPL). For larger vessels (> 1 mm), the Nd:YAG laser is preferred with the smallest fluence and smallest spot sufficient for closure.

The improvement of the vessels and pigment is obtained by the direct heating of melanosome or HgB. Adequate pulse widths range from 0.45 to 50 ns and can be delivered by either the explosive Q-switched nanosecond (10^{-9}) pulses, or by a gentler heating with millisecond (10^{-6}) pulses.

Do's

- Do encourage male patients to remove unaesthetical telangiectasias and hyperpigmented spots with lasers or IPL.

Don'ts

- Do not use Q-switched devices for hyperpigmented spot if the male patient cannot be with an evident crust.

7.6 Vessels Removal

Male patients with fair skin complexion present a lower level of chromophores within the skin layers and HgB can be treated with minimal surface cooling

If a male patient presents with telangiectases confined to very small areas, a long-pulsed KTP laser should be employed. The ergonomic simplicity of this procedure and the real-time assessment of the vessel clearing are unsurpassed. IPL devices may be used as well for the treatment of telangiectases in male patients; however, temporary hair reduction at the preauricular area where many telangiectases are observed may result.

Poikiloderma is best treated by IPL, large spot KTP, or extended pulse dye lasers. Multiple sessions are needed and some patients are quite resistant to treatment.

The association of topical bleaching agents with hydroquinone or kojic acid and sun block may speed up the process as long as the ecstatic vessels are treated. Male patients should be advised that sun exposure should be avoided during treatment.

Do's

- Do avoid crusts while treating telangiectasia and poikilodermia in male patients. They expect no treatment evidence.

Don'ts

- Do not apply too much pressure with the crystal against the male skin at the nose level for the treatment of telangiectases, even being the male skin thicker and harder than the female. The vessels may occlude and no light absorption will result.

Key pointers

- Male patients with fair skin complexion can be handled with minimal surface cooling for facial telangiectases.
- Male patients tend to have poikiloderma treated only during wintertime. As they are frequently tanned, sun exposure should be avoided during treatment.

7.7 Pigment Removal

Melanin is designed to preferentially absorb the damaging UV wavelengths, and its ability to absorb light decreases exponentially with longer wavelengths. Melanin absorbs a broad spectrum of wavelengths, decreasing in absorption on going from the short ultraviolet (UV) wavelengths into the long infrared wavelengths. Melanosomes and pigmented cells are affected at different depths from micrometers to milimeters in the skin with laser and IPL treatments. The melanosomes suffer a submicroscopic and mechanical rupture and this induces bleaching of the pigmented cells. The immediate whitening of the lesion after the application means that the melanosome rupture was effective. It is a clinically useful endpoint sign.

Depending on the device employed, a specific light and skin interaction will result and it must be taken into account when explaining it to male patients. In case of an isolated hyperpigmented spot, there are two ways of treating it. If a Q-switched laser with nanosecond (ns) pulses is to be used, a quicker resolution is obtained; however, for some patients, an immediate crusting may be socially intolerable. There are male patients who prefer to have a less obvious crust even if that requires more than one session. For those, millisecond (ms) devices are preferable.

Lentigines can be treated with an erbium resurfacing laser and bleaching is obtained by exfoliation. If treated by a 532 nm laser, there is no need to apply any protective gel on the skin surface. Typically, the pigmented area becomes white initially and then darker after the

treatment. Over the next several days, the darkened portions separate off the lesion and it becomes lighter. Depending on the male skin type or too high energy applied, a temporary hypopigmentation may result after the treatment. Lighter Caucasian male patients who present few discrete lentigines may be treated with a Q-switched alexandrite laser. The endpoint is gentle frosty whitening. In such patients, the risk of postinflammatory hyperpigmentation (PIH) is very low. The risk increases for the treatment of lighter-skinned Asian and Hispanic patients, as well as tanned type II and III Caucasian men. Darker skin complexions have a high risk of PIH independent of the wavelength used; however, longer pulse visible light technology seems to be less likely to cause PIH in darker patients (Kono et al. 2006).

Actinic keratoses can be treated with photodynamic therapy. In this process, 5-aminolevulinic acid can be applied to the skin for 1 h followed by blue light therapy. There may be some discomfort with the treatment, with some redness, swelling, or crusting after treatment, especially during the first 2 days. Around 90% of the actinic keratoses may be cleared with a single treatment (Touma et al. 2004).

Do's

- Do select equipments with minimal lateral thermal damage.
- Do indicate laser or IPL for the removal of epidermal and dermal lesions such as lentigines, café au lait macules, nevus spilus, Becker's nevi, blue nevi, and nevus of Ota.
- Do seek for lesion whitening after the Q-switched laser application on hyperpigmented spots. This biological response to light means effective reaction and melanosome rupture.
- Do employ an ablative laser or a Q-switched or even a ruby laser for the treatment of exophytic seborrheic keratoses (SKs).
- Do use a Q-switched laser with small spot and vaporize smaller flatter SKs by repeated pulses.
- Do associate topical hydroquinone and retinoids with Q-switched Nd:YAG laser for the treatment of male melasmas.

Don'ts

- Do not apply sublethal fluences when treating hyperpigmentation. Pulses tend to stimulate melanogenesis rather than destroy pigmented cells.
- Do not treat male melasmas only with IPL or lasers. Although there is almost 100% of nice resolution within 1–2 weeks, worsening of the melasmas follows after that period.
- Do not count only on laser or IPL systems for the treatment of melasmas, postinflammatory hyperpigmentation, or drug-induced hyperpigmentation.

FAQs

What are the visible signs that relate to effectiveness of the treatment of hyperpigmented spots with Q-switched lasers?
Immediate focal whitening and slight skin papules followed by erythema.

How can diffuse hyperpigmentation be better treated in male patients?
Diffuse hyperpigmentation such as actinic bronzing is better treated with a long-pulsed KTP or IPL with contact cooling.

What is the treatment plan for a Caucasian patient with both darker and lighter lentigines?
A Q-switched alexandrite laser can be applied for the lighter lentigines first, followed by pan-facial treatment with IPL or KTP laser.

And in case of only an IPL device is to be used?
The best possibility if only an IPL device is to be used is to employ increasingly higher fluences with serial sessions.

How SKs should be treated with lasers?
SKs may be handled by different methods, either by ablative lasers (CO_2 or Er:YAG lasers) or Q-switched alexandrite.

Can male sebaceous hyperplasia be treated with IPL or lasers?
Yes. Men with fair-skin with a ruddy complexion may be treated with PDL with purpuric settings to diminish lesion size. High-fluence small-spot KTP laser is another effective alternative.

7.8 Tattoo Removal

Tattoos mainly consist of intracellular insoluble ink particles of sub-micrometer size that were phagocytized after intradermal injection. The ink used in professional tattoos includes mainly insoluble metal salts, oxides, or organic complexes. Becasue the ink pigments are placed in the mid-dermis, deep laser light penetration is required for tattoo removal. This means that laser light should penetrate through epidermis, where melanin pigment resides and which is the main competing chromophore. Most of the melanin pigment in untreated skin lies in the epidermis, above the tattoo-containing macrophages found in the dermis. Therefore, for the administered laser light to reach the tattoo, it needs to traverse the epidermis.

Tattoos with different color pigments require multiple wavelengths of laser light to be removed. Generally, shorter wavelengths of electromagnetic radiation scatter more than the longer wavelengths. Similarly, in our skin, the longer wavelength are scattered less, allowing them to penetrate more deeply. The size of the laser beam also influences the depth of penetration of the laser light, as much or more than the wavelength itself. As light scatters at the edge of a field, a small spot will result in a greater proportion of the light being scattered and does not reach the significant depths in the skin. Based on this, the largest available spot size capable of delivering clinically relevant fluences should be used for the treatment of tattoos.

Generally, the color of light we see from an object is the light reflected from the object to our eyes. So, the color we see in a tattoo is generally not a good treatment color to remove the tattoo (a green tattoo cannot be removed using a green-light emitting laser). The result of tattoo removal is better when the laser wavelength is well absorbed by the particular ink. One specific ink color is best removed by one specific wavelength.

7.8.1 Q-Switched Lasers

Q-switched lasers are the most suitable devices for tattoo removal. Q-switching is a means of producing a very short laser pulse in the nanosecond domain. It enables the deposit of energy very quickly, producing a photoacoustic effect. The intense heat transients cause some particles to shatter and destroy the cells in which the pigment resides. This eventually triggers phagocytosis and the packing of tattoo fragments for lymphatic drainage (Kuperman-Beade et al. 2001). Greater tattoo clearance is obtained when picosecond pulsed lasers are used (Ross et al. 1998).

When pulsed or Q-switched lasers are used, the risk of scarring is low, although there may be textural and color skin changes. There are three types of Q-switched lasers: the ruby, the alexandrite, and the Nd:YAG lasers. In general, tattoo removal hurts almost as much as getting a tattoo done. Topical anesthetic cream should be applied for the smallest tattoos. For the others, local infiltration of buffered 1% lidocaine with epinephrine should be employed for best pain control. With Q-switched lasers, pieces of skin can often be aerosolized, and blood can be spatter during treatments. This results from the rapid heating of the skin surface during the extremely short pulses delivered by the laser, and a shock wave is generated by these ultra short pulses or a combination of these effects. A clear hydrogel dressing can be applied to avoid tissue scatter and bleeding.

7.8.2 Q-Switched Ruby Laser

Modern ruby lasers operate with a wavelength of 694 nm, pulse duration time from 25 to 40 ns, fluences up to 8–10 J cm^{-2}, and spot sizes up to 6.5 mm. The laser penetrates to a depth of approximately 1 mm. The most responsive pigments are black, blue-black, and dark blue.

7.8.3 Q-Switched Alexandrite Laser

The Q-switched alexandrite laser emits a wavelength of 755 nm. The pulse range is of 50–100 ns, fluence of 8 J cm^{-2}, and variable spot sizes. Good results have been observed

for black, blue, and green pigments. The alexandrite laser became known as the treatment choice for green pigments.

7.8.4 Q-Switched Nd:YAG Lasers

The Q-switched lasers are capable of emitting two wavelengths of light: 1,064 and 532 nm wavelengths. The 1,064 nm is invisible to human eye while the 532 nm is in the green range. The 1,064 nm Nd:YAG laser has pulse duration of less than 20 ns, and spot sizes ranges from 1.5 to 8 mm and energy densities up to 12 J cm^{-2}. It is suitable for black and dark blue pigments. The 532 nm Nd:YAG is suitable for the treatment of red, yellow, and orange pigments (Figs. 7.10a, b).

7.8.5 Dye Laser

The flash-pumped pulsed dye laser emits a wavelength of 510 nm and has a much longer pulse time of 300 ns. It can only be used for tattoos with red dyes or for certain orange and yellow pigments.

7.8.6 Posttreatment

Posttreatment wound care is very important to obtain a good cosmetic result. After laser treatment, paper tape is applied over the hydrogel dressing, in case that it was used during the laser treatment. As male patients may contain hair in the treated area, local shaving can

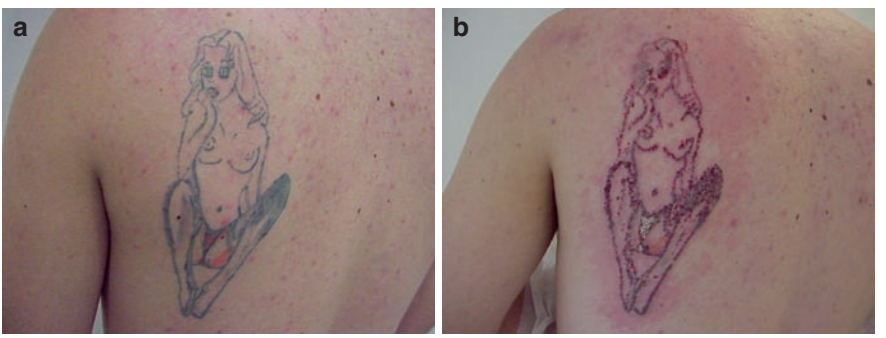

Fig. 7.10 (**a**) Blue and black inks are normally easier to remove than red and green ones. (**b**) Immediate result after the irradiation of 1,064 nm Nd:YAG for the blue ink and of 532 nm Nd:YAG for the red ink. Patients should follow proper wound care and should avoid crusts removal. Anti-histaminics may be helpful during this phase.

be performed to better dressing adherence. Patients are also instructed to change the dressing at home to a nonstick dressing with an occlusive ointment that does not contain antibiotics. Petroleum aqua gels can be a very good alternative. Crusting and scabbing that last for 7 or more days after the treatment should be expected.

7.8.7 Amateur × Professional Tattoos

The number of sessions needed for tattoo removal varies according to the equipment used and if it is an amateur or professional tattoo. Amateur tattoos generally respond much more rapidly than professional ones, when placed with Indian ink. After treatment, the tattoo particle is fractured into smaller subparticles that will either be rephagocytized or be eliminated in the scale crusts. Much of the ink that is removed from the skin is not removed from the body and is drained to lymph nodes. Irreversible laser-induced photochemical changes may result after laser treatments, especially in white ink. The ink darkening may impair further removal and a pretest is advisable. Patients with tattoos containing metal salts – mercury (red), cadmium (yellow), chrome (green), and cobalt (blue) – may develop local allergic or photoallergic reaction. Permanent color changes from red, skin color, white, yellow, or brown tones to black, gray-black, or dark green are common. It results from the change of iron-containing pigments to iron oxide (Peach et al. 1999).

7.8.8 Traumatic Tattoos

Traumatic tattoos acquired as a result of fireworks or explosives may contain flammable particles embedded in the skin. They may reignite after laser treatment and result in significant scarring. Another concern is that tattoo pigments once in the skin can have their composition altered, resulting in unknown products (Baumler et al. 2000).

7.8.9 Complications

Complications are linked to the type of laser used, energy density applied, number of sessions, and intervals between treatments. Early complications include blisters, crusts, and pruritus. Hyper or hypopigmentation and textural changes are also found. Lasting scarring or textural alterations, such as skin puckering, mild erythema, or a waxy surface can occur in rare instances. In some cases, hypopigmentation may be persistent and repigmentation treatment should be carried out with excimer laser. A total of 40 sessions over a period of 14 months had been necessary in some cases (Gundogan et al. 2004).

Do's

- Do use the largest available spot size capable of delivering clinically relevant fluences for the treatment of tattoos. Besides the better result, it avoids textural changes.
- Do avoid treating sun-tanned male patients for tattoo removal with lasers. Bleaching agents such as hydroquinone may be applied before the treatment and after in case if postinflammatory hyperpigmentation occurs.
- Do apply topical anesthetic cream for the smallest tattoos and for the others; local infiltration of buffered 1% lidocaine with epinephrine should be employed for best pain control.
- Do apply a clear hydrogel dressing when treating tattoos with Q-switched lasers to avoid tissue spatter and bleeding that can be significant and can pose a threat of exposure to blood-borne pathogens.
- Do find an alternative laser device if a given laser no longer results in fading a tattoo.
- Do use topical antiseptics (not antibiotics) to prevent infection in case of blisters and crusts formation after laser treatment.
- Do instruct patients not to unroof blisters. They should be handled in the office.
- Do apply topical corticosteroids during the healing phase to minimize pruritus and, if needed, 2 weeks after the treatment in case of cobblestone texture of the skin.
- Do keep 1–2 months interval between sessions. It minimizes color and textural alterations.
- Do test a traumatic tattoo that resulted from fireworks in a small area before the treatment. Make sure the local hair is shaved in male patients.

Don'ts

- Do not treat white tattoos without previous laser test in male patients with darker skin complexion.
- Do not treat tattoos in areas with significant postinflammatory hyperpigmentation.
- Do not use Q-switched lasers for tattoo removal in case of preexisting allergic reaction on the skin. It can worsen resulting in urticaria and may cause systemic reaction.
- Do nit increase the laser fluence in refractory tattoos by shrinking the spot size. More of the administered energy will be placed superficially in the skin, resulting in higher risk for scarring and side effects.
- Do not use lasers with millisecond duration pulses for tattoo removal. They result in excessive scarring while leaving much of the tattoo pigment behind.
- Do not be disappointed if green pigments are difficult to be removed even by alexandrite lasers.
- Do not overlap more than 10–20% when treating tattoos.
- Do not apply dressing with antibiotics after laser tattoo removal or else may result in contact dermatitis.

Key pointers

- In general, tattoo removal hurts almost as much as getting a tattoo.
- Patients presenting for tattoo removal often think that the laser erases the tattoo like a pencil mark being erased from a piece of paper.
- Red and near-infrared wavelengths of light penetrate deep into the skin. Competing chromophores such as hemoglobin absorb poorly at these wavelengths.
- Red and infrared lasers are ideal for removing dark tattoos.
- All Q-switched lasers present similar outcomes for removing black tattoo pigment.
- The advantage of the Q-switched Nd:YAG laser (1,064 nm) over the Q-switched ruby laser (694 nm) in the treatment of blue and black ink is that the former overcomes the obstacle of excessive melanin absorption and is more suitable for darker skin types.
- Ruby laser has the greatest clearance rate for removing blue–black tattoo pigments among the Q-switched devices and the highest incidence of hypopigmentation as well. It is also the most effective for removing purple and violet pigment.
- Red brown, dark brown, and orange pigment are best removed by Nd:YAG lasers.
- Alexandrite laser is the most effective for the treatment of blue and green pigments.
- The more selective the laser is, minor lateral thermal damage and fewer complications such as scarring and depigmentation will occur.
- When too much epidermal pigment is present in dark-skin or tanned male patients or when there is dermal postinflammatory hyperpigmentation, laser treatment may result in scarring.
- After laser treatments, the presence of an odorless yellowish secretion after the use of topical antibiotics is usually contact dermatitis and not infection.
- Textural changes may happen after laser tattoo removal and usually resolve within 4–6 weeks; hence there should be a minimum of 6 weeks between sessions.

FAQs

What are the standard treatments for tattoo removal?
The conventional treatments include surgical excision, dermabrasion, salabrasion, chemical peels, and CO_2 laser vaporization. Those methods lead to complications such as scarring and hypo- or depigmentation. The best treatments are those that result from the selective photothermolysis that include the IPL systems and Q-switched lasers.

What should be warned to male patients willing to be subjected to laser tattoo removal in the initial visit?
It is important to point out that although it takes only a day to get a tattoo, it can take 6–10 treatments or more to remove one. In total, it can reach up to 2 years and a bill of 1,000 dollars in contrast to a few hundreds to receive the tattoo.

What are the mechanisms of tattoo removal with lasers?
Fragmentation of ink particles; release to extracellular dermal space; partial elimination in a scale crust; greater elimination into lymph nodes; rephagocytosis of remained ink particles.

What does double frequency Nd:YAG mean?
Using a KTP crystal, the frequency of the Nd:YAG laser can be doubled and thus, the wavelength is halved to 532 nm in the visible green range. It becomes absorbable by red dyes and melanin.

What is the endpoint of dark pigment with lasers?
Black and dark blue pigments should turn white immediately after the treatment.

Is it possible to remove a tattoo in a hairy area? Can the hair become permanent white after the treatment?
Yes, it is possible to remove a tattoo in a hairy area and depending on the wavelength used, the hair can be shaved before to reduce pain or any discomfort. Hardly ever will hair become permanent white after laser tattoo removal.

Why some tattoos may become refractory to certain wavelengths after multiple treatments?
The first reason is that a given wavelength has already removed all the pigment that could be absorbed by the laser, and second, the remaining particles may have been altered by the initial laser treatment and been made refractory to it.

Are some amateur tattoos difficult to be removed?
Yes. There are some amateur tattoos that are quite resistant to removal with any of the Q-switched lasers due to the quality of the ink used.

What are the most difficult pigments to remove?
The purple and yellow dyes seem to be the most challenging pigments to be removed.

What reaction should be seen on the skin after the laser application?
Usually, the goal of the treatment should be immediate tissue whitening (corresponding to water vapor in the skin) with minimal or no bleeding.

How many sessions are usually required for tattoo removal?
Amateur tattoos may require 4–6 sessions and professional tattoos usually 6–10, but sometimes more than 20. Recent or deep tattoos may require an even greater number of sessions for removal.

Which laser is the most suitable for male patient with darker skin complexion in a hairy area?
The Q-switched Nd:YAG laser (1,064 nm) is the most suitable. It presents the deepest penetration and carries the least risk of hypopigmentation. It is also the least likely to damage hair follicles.

How occlusive dressings should be applied in hairy male patients after laser tattoo removal
The use of occlusive ointment dressings with no antibiotics is very important after laser tattoo removal. For better dressing adherence, local hair should be shaved before the procedure.

What are the early complications found after tattoo removal with lasers?
Depending on energy density, wheals, punctuate bleeding, blisters, and crusts may form after the treatment. Topic antiseptics may be used to prevent infection.

What are the common skin color changes that may happen after laser treatments?
Hyperpigmentation tends to depend more on skin type than on laser treatment. Transient hypopigmentation occurs more frequently after ruby laser treatments and may remain from 2–6 months. The greater the number of sessions, the higher the risk of developing hypopigmentation.

What is the risk of scarring after laser tattoo removal?
It is less than 5% and is highest on the chest, outer upper arm, and ankle.

7.9 Hair Removal

Traditional hair removal methods include shaving, plucking, waxing, chemical depilatories, and electrolysis (Olsen 1999). None of these methods are ideal as their effects are short-term. Furthermore, the treatments may be tedious and adverse effects can occur and include pain, skin redness, swelling, blistering, crusting, infection, allergic eczema, decreased and increased skin pigmentation, as well as scarring (Liew 2002). Non stopping growing consumer demanding for better hair removal has led to newer treatment techniques with laser devices and intense pulsed light (IPL) that are considered the most efficient methods for removal of unwanted hair (Figs. 7.11a, b).

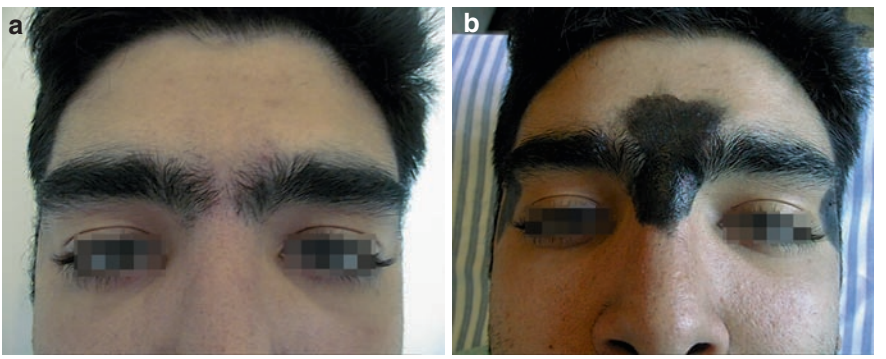

Fig. 7.11 (**a**) Some male patients dislike the presence of excessive hair between the eyebrows. (**b**) This patient was subjected to hair removal with the old technology of carbon paste and application of the 1,064 nm Nd:YAG laser.

7.9.1 The Human Hair

Male hyperthrichosis or pure cosmetic hair removal are effectively undertaken by lasers and IPL systems. The human hair follicle is derived from both epidermal and dermal components. The hair matrix is heavily pigmented due to greater melanin concentration when compared to the epidermis. The matrix cells are located at the base of the hair follicle from 2 to 7 mm below the skin surface. The matrix is supplied by a neurovascular tuft of dermis called papilla. The stem cells reside in bulge area that lies about 1.5 mm below the surface near the insertion of the arrector pilli muscle. During the anagen (growth) phase, the stem cells proliferate to form the matrix. At the end of the anagen phase, the matrix and lower portion of the follicle degenerate and the telogen (resting) phase begins.

Over recent years, several devices have been developed, which are now offered as standard treatments for unwanted hair growth. The wavelength regions include the red and near-infrared lasers or light sources. Any of those systems are based on the same concept for hair removal, which is the selective photothermolysis, which is an optimal interaction between light and skin whereby selected skin structures are target without damaging adjacent skin structures. Selective photothermolysis is possible when melanin pigment in the hair follicles absorbs the wavelengths selected and the pulse duration is shorter than the time it takes for the heat to dissipate from the hair follicle into the surrounding tissue. The hair follicles are selectively destroyed by thermal damage and future hair growth is impaired. There is great variation in treatment outcome after laser or IPL hair removal. These variations are related to skin and hair characteristics such as skin pigmentation, hair color, hair thickness, hair growth cycle, anatomical region and depth of follicles, as well as endocrine dysfunction.

The available systems for hair removal include ruby lasers (694 nm), alexandrite lasers (755 nm), and diode lasers (800, 810 nm), Nd:YAG lasers (1,064 nm), and IPL sources (590–1,200 nm). It is important that the male patients seeking removal of unwanted hair have realistic expectations of the treatment outcome from laser and photoepilation. The terminology permanent hair removal arises much confusion due to the fact that "permanency" for patients means that removed hair does not regrow at all. Instead of this, the definition should be given to patients as a long-term, stable reduction in the number of hairs regrowing after a treatment regimen, which may include several sessions. The number of regrowing hairs must be stable over a time greater than the duration of the complete hair cycle of hair follicles, which varies from 4 to 12 months according to the body location. So, in this context, permanent hair reduction does not necessarily imply the elimination of all hairs in the treatment area.

Male patients with pseudofollicullitis barbae with high density on the area to be irradiated should be warned that redness, crusts, and even pustules may be seen in the first days after the treatment (Figs. 7.12a, b and 7.13).

Do's

- Do shave male patients immediately before the procedure. Any growing hair above the skin may absorb the light, provoking local burn and decrease of effect.

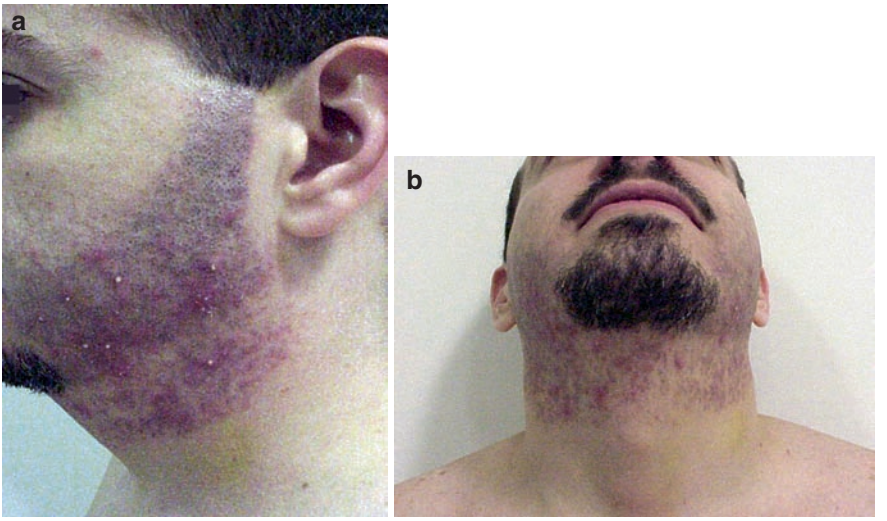

Fig. 7.12 (**a**) and (**b**) Laser hair removal on the neck area is very common in male patients who have frequent pseudofolliculities barbae. This photo represents the second day after laser hair removal with diode. This feature is a common finding in male patients who have a very high density of hair in the treated area. The presence of pustules can also be found and need proper care. The inflammation may persist for a week and patients might not be able to wear a tie.

Fig. 7.13 Hair removal in male patients with high density of follicles may lead to this skin aspect after the treatment. This feature is more commonly found in the first sessions and tend to improve with the decrease of hair population. This patient was subjected to diode laser and needed facial blocking to control pain. Topical anaesthetic and ice bags were insufficient.

Don'ts

- Do not wax male patients before laser treatments for hair removal. The pigmented hair shaft is an important chromophore for laser and IPL treatments.

Key pointers

- The bulge and the papilla are important targets for laser hair removal.
- There is great variation in treatment outcome after laser or IPL hair removal. These variations are related to skin and hair characteristics such as skin pigmentation, hair color, hair thickness, hair growth cycle, anatomical region and depth of follicles, as well as endocrine dysfunction.
- It is important that male patients seeking removal of unwanted hair have realistic expectations of the treatment outcome from laser and photoepilation. The terminology permanent hair removal arises much confusion still.

FAQs

What are the side effects and their intensity after laser and IPL hair removal?
They are minimal and include pain, transient erythema, edema, and focal epidermal injury and pigmentation changes.

7.10 Laser Lipoplasty

There have been studies on the role of lasers for the treatment of localized fat. An optical fiber delivering 1,064 nm Nd:YAG laser energy to treat lipodystrophy has been pointed out to perform lipolysis by selective photohyperthermia of fat cells. The treatment produced an oily residual that needed to be removed with traditional liposuction cannulas. Histological changes, including coagulation of small blood vessels, collagen reorganization of the reticular dermis, and the formation of small channels by the laser were evidenced. Although the cosmetic result was quite similar to the traditional method, collagen effect and less bleeding may offer a theoretical advantage (Goldmann 2006).

When only the optical fibers were used in another study without any mechanism to evacuate the byproducts of lipolysis, a direct correlation between energy used and volume change was observed (Kim 2006). A comparative double-blind study between the laser and traditional suction-assisted lipoplasty found no difference in the surgical outcomes and demonstrated a steep learning curve and increased equipment costs as negative aspects of the laser method. Besides that, the laser technique caused significantly more damage to the fat and required the aspiration of the emulsified fat to prevent complications. There was neither less pain nor a quicker recovery time (Prado et al. 2006). For head and neck, no compelling evidence has been shown to warrant laser lipoplasty so far.

7

Top 10 key pointers

- Many men who are chronically tanned are not keen on applying sunscreen on a regular basis. The excessive pigment compromises the treatment options for some lasers and IPL devices.
- Laser and light procedures for male patient include the treatment of vascular and pigmented lesions, hair removal, acne and acne scars, rhinophyma, mild skin laxity, and photoageing.
- A drawback with CO_2 laser resurfacing for male patients is the complicated postoperative phase. The need of intense skin care, debris, and crusting removal may be quite disturbing for male patients. An alternative is the use of only a single pass that produce skin vaporization, collagen shrinkage, but little skin tightening.
- Among all the indications that male patients may benefit from ablative lasers, scarring caused by acne may be considered number one.
- Skin-tightening procedures with infrared or radiofrequency technologies appeal more to male patients than surgical facelifts, even on the result being limited.
- Not all IPL sources may be performed in the beard area, as unwanted hair reduction can ensue, giving a patchy appearance. In contrast, fractional lasers are safe to treat in the beard area and may be considered the first option for pigmented lesions.
- As male patients may contain hair in the treated area, local shaving can be performed to better dressing adherence.
- When IPL or long-pulse alexandrite lasers are to be used for the treatment of hyperpigmented spots, darker beard areas should be avoided due to little risk of alopecia.
- It is not unusual that temporary hypopigmentation result after laser or IPL treatment of hyperpigmented spots in male patients.
- Male hyperthrichosis or pure cosmetic hair removal are effectively undertaken by lasers and IPL systems.

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Botulinum Toxin in Men

8

Berthold Rzany

Men and women have the same mimic muscles. However, in men, muscles tend to become bigger because of the influence of the androgens (Macdonald et al. 1998), requiring consequently a higher total dosage of botulinum toxin A (BoNT-A). Besides the total dosage different aesthetic concepts between men and women have to be acknowledged. Feminizing aesthetic features as raised lateral eyebrows need to be strictly avoided.

The following chapter is based on the recommendations for the most commonly used produxts on the market: Botox®, Xeomin® and Dysport®. New products are going to enter the market in the next few years. Some of these products might just have a different name (nothing to worry about), or products produced in license of one of the above products (basically a generic drug), or totally new products. Comparative studies – especially for the newly designed products – are needed to make sure that they offer a comparable efficacy and safety profile.

8.1 Dilution of the Two Main Products

Most used dilution in clinical trials on botulinum toxin A is 2.5 mL. However, when injecting higher dosages, for example, 20 Dysport® U or 8 Botox® U per injection point, lower dosages might be used to avoid an increased volume per injection points (see Tables 8.1 and 8.2). An increased volume carries theoretically an increased risk of adverse events (Hsu 2004). Furthermore, the injection points present as larger bumps which might take a bit longer to dissapear and may be therefore cosmetically embarassing in male patients.

As so far no placebo controlled trials have been published for the aesthetic indication of Xeomin®, our knowledge on Xeomin® is limited to studies on neurology and ophthalmology. From these studies, a 1:1 ratio to Botox® seems to be reasonable.

8.2 Estimating the Right Dosage

Most studies on botulinum toxin A for aesthetic indications have been conducted in women or in a study population predominated by women. On the basis of a study from Carruthers (Carruthers and Carruthers 2005) on Botox®, men need higher dosages (40 Botox® U)

M. de Maio and B. Rzany, *The Male Patient in Aesthetic Medicine*,
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Table 8.1 Botox®: U per mL for different dilutions

0.9 % saline/ Botox® 100 U in	0.01 mL	0.02 mL	0.05 mL	0.1 mL	0.15 mL	0.2 mL
1.0 mL	1	2	5			
2.0 mL	0.5	1	2.5	5		
2.5 mL	0.4	0.8	2	4		
3.0 mL	0.33	0.66	1.66	3.33	5	
4.0 mL	0.25	0.5	1.25	2.5	3.75	5

Botox® is also distributed for Aesthetic indications as Botox® Aesthetics, Vistabel® and Vistabex®. As some Vistabel® contains 50 U, the amount of saline should be adjusted accordingly, i.e., to obtain the same dilution as for 100 U in 2.5 mL only 1.25 mL 0.9% saline needs to be added to a 50 U vial.

Table 8.2 Dysport®: U per mL for different dilutions

0.9 % saline/ Dysport® 500 U in	0.01 mL	0.02 mL	0.05 mL	0.1 mL	0.15 mL	0.2 mL
1.0 mL	5	10	25			
2.0 mL	2.5	5	12.5	25		
2.5 mL	2	4	10	20		
3.0 mL	1.7	3.3	8.3	16.7	25	
4.0 mL	1.3	2.5	6.3	12.5	18.8	25

Dysport® is also distributed for Aesthetic indications besides the 500 U vial in a 300 U vial (North America) and as Azzalure® (Europe) in a 125 U vial. The amount of saline should be adjusted accordingly, e.g. 125 U Azzalure® need to be diluted with 0.63 ml and 300 U Dysport® need to be diluted with 1.5 ml 0.9% saline to obtain the same dilution as with 2.5 ml for 500 Dysport® U.

for the treatment of glabella compared with women (20 Botox® U). The reasons for that might be twofold: for example, a larger muscle mass and/or an increased muscular activity. There is no good anatomical or physiological data to prove either of this. However, on the basis of the glabella studies, men do seem to need more botulinum toxin to reach the same effect as women.

Therefore, the dosage need to be adjusted individually based on the area needed to be treated and the activity of the muscles. Kinetic patients probably do not need to have the dosages adjusted. In contrast, in hyperkinetic or even hypertonic patients, the dosages need to be higher (Table 8.3) (de Maio and Rzany 2007). What is the right procedure? It depends on the experience of the treating physician and the preferences of the patients. In a first time patient, the physician may start with a standard dosage and then reschedule the patient approximately 2 weeks later to ensure that the adequate dosage was administered. If the initial dosage is not sufficient, that is, if the patient still shows too much muscular movement, the patient should be reinjected with a couple of more injection points. For the subsequent visit, the total dose might be applied at the first visit. To avoid the injection of large volumes per injection point and presumably an increased risk for adverse events, either additional injection points might be used or the vial might be diluted with less saline.

Table 8.3 Classification of muscle strength as a criteria for dosaging (de Maio and Rzany 2007)

Muscle activity	Clinical description	Effect on treatment plan
Kinetic (Fig. 8.1a–d)	In kinetic patients, there is a concordance of the emotion and the mimetic expression. If the patient wants to express anger or concern, the muscles at the glabella area are contracted. There is a perfect timing of the mimics and the emotional feeling	The duration of effect in kinetic patients is the longest among the groups. It may last 7–9 months and sometimes even longer. The procedure is usually undertaken only once a year
Hyperkinetic (Fig. 8.2a–d)	In this group, patients have no concordance between muscular contraction and the emotion to be expressed. In general, the muscle cycles more rapidly than the desired emotion or the contraction may appear without the willing of emotional expression. At rest there is no or only a small line visible	For these patients, the results may last from 4 to 6 months, sometimes even less. Patients return for treatment twice or three times a year
Hypertonic (Fig. 8.3a–d)	Hypertonic patients cannot relax their muscular movements. At rest lines or even folds are visible	The duration of result in these patients is the shortest among all groups. Both patients and practitioners get disappointed with the injection for two main reasons: the wrinkle does not disappear completely and muscular contraction may be blocked only for one or two months

8.3 Treatment Recommendation

Basically all areas that can be treated in female patients can be treated in male patients, too. However, some areas – as the bunny lines and the lateral brow lift, for example – are less frequently treated in men. The most common indications in men are forehead, glabella, and crow's feet.

Please note that the dosages given in this chapter will be Botox® and Dysport® units. Botox® Aesthetics, Vistabel®, or Vistabex® are the other brand names for Botox®; Azzalure® is an other brand name for Dysport®. When using Xeomin®, please take the Botox® units as a guidance.

8.3.1 Forehead

The forehead is the area where treatment differs between men and women. First, the goal of treatment is different. Of course, for both men and women it is the decrease of forehead

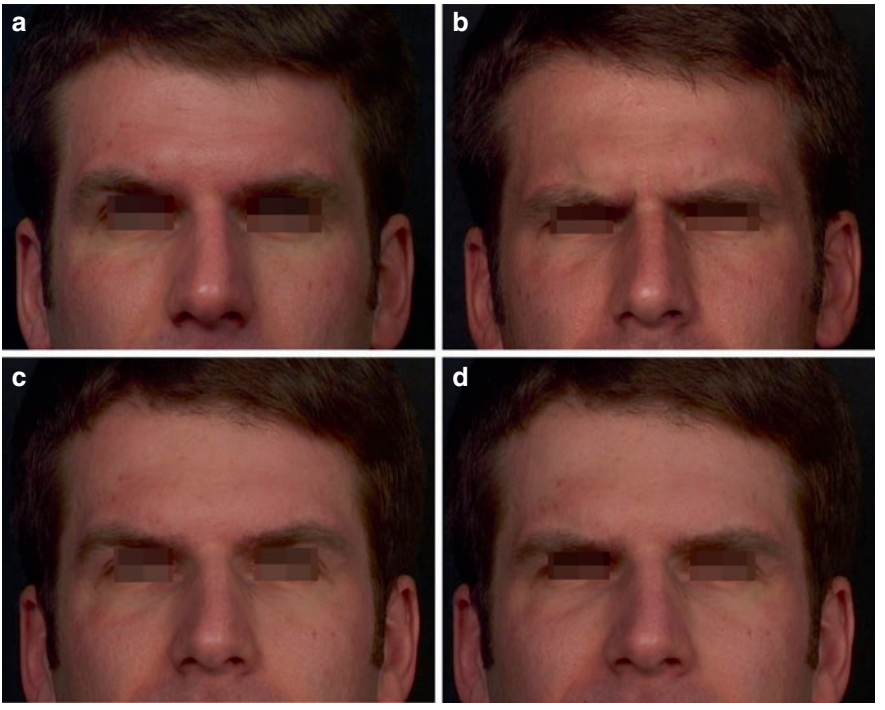


Fig. 8.1 (**a**) and (**b**) Kinetic male patient at rest and at maximum frown before treatment. (**c**) and (**d**) Kinetic male patient at rest and at maximum frown after treatment with BoNT-A. The muscles are relaxed, no line is visible.

wrinkles. What differs is the appearance of the eyebrow; this should be in general laterally raised in women but straight in men. Second, men might be bold. This translates into a larger area to be treated. Third, bushy eyebrows. As the frontalis muscle is the only elevator of the upper third, treating the forehead is always accompanied by an increased risk of brow ptosis, which becomes more visible in bushy eyebrows.

8.3.1.1 Injection Points in the Male Patient

Four to six injection points are sufficient to treat the forehead (Figs. 8.4, 8.5a–c, and 8.6a–c). The injection points should be distributed in the middle of the forehead area. The lateral injection points should be placed in line with the lateral corner of the eye. If the lateral injection point would be placed in the mid-pupil line, the lateral parts of the m. frontalis would lift the lateral parts of the eyebrows upward. This distribution of injection points is preferable in female patients, and it is not recommended in men.

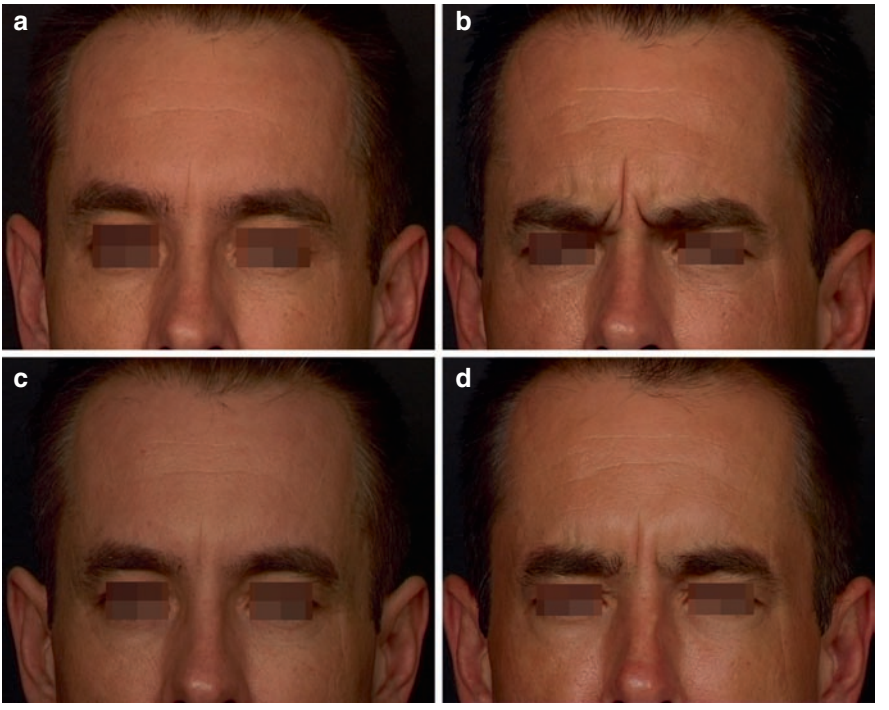


Fig. 8.2 (**a**) and (**b**) Hyperkinetic male patient at rest and at maximum frown before treatment. (**c**) and (**d**) Hyperkinetic male patient at rest and at maximum frown after treatment with BoNT-A. The muscles are relaxed, there is still some movement possible (hypotonic pattern), a small line is still visible.

8.3.1.2 Injection Points in the Bald Patient

A high proportion of men tend to loose hairs during life, often leading to extensive androgenetic alopecia. Bald patients or patients who did choose to shave their scalp voluntarily, especially when a brow ptosis is already present, do pose a challenge. Restricting the treatment to a line in the mid forehead area might give a strange looking appearance, with residual wrinkling above a wrinkle-free zone. Therefore, superior wrinkles need to be treated with additional points or an additional line (Figs. 8.7 and 8.8a–c).

8.3.1.3 Injection Points in Male Patients with Bushy Eyebrows

Depending on the degree of elastosis, these patients need to be treated very carefully. It might be better to aim for an under-treatment than for the optimal treatment. In case brow ptosis occurs and bushy eyebrows are present, a hairdresser or a beautician might be helpful in decreasing the effect of brow ptosis.

Fig. 8.3 (**a**) and (**b**) Hypertonic male patient at rest and at maximum frown before treatment. (**c**) and (**d**) Hypertonic male patient at rest and at maximum frown after treatment with BoNT-A. The muscles are only partially relaxed (hypotonic pattern), a deep fold is still visible even at rest. These patients may require a cotreatment with an injectable filler to improve the results further.

8.3.2 Complications of the Forehead Treatment in Men

8.3.2.1 Brow Ptosis

Brow ptosis is the most common and unwanted adverse event. There are several reasons for brow ptosis: (1) weak frontalis muscle. In case the frontalis muscle is weak, even small dosages of BoNT-A may lead to brow ptosis. (2) High degree of elastosis. More visible brow ptosis has led to excessive skin. Here an overactive frontalis muscle might compensate to the increase in laxity. Relaxing this muscle will inevitably lead to brow ptosis (Fig. 8.9) (3) Low eyebrow pattern. In some patients eyebrows are already very low. Here, even moderate dosages might increase the effect.

There are no pharmacological corrections for brow ptosis. The patient should be reassured that this effect will be temporary. Some patients do accept brow ptosis for a wrinkle-reduced forehead.

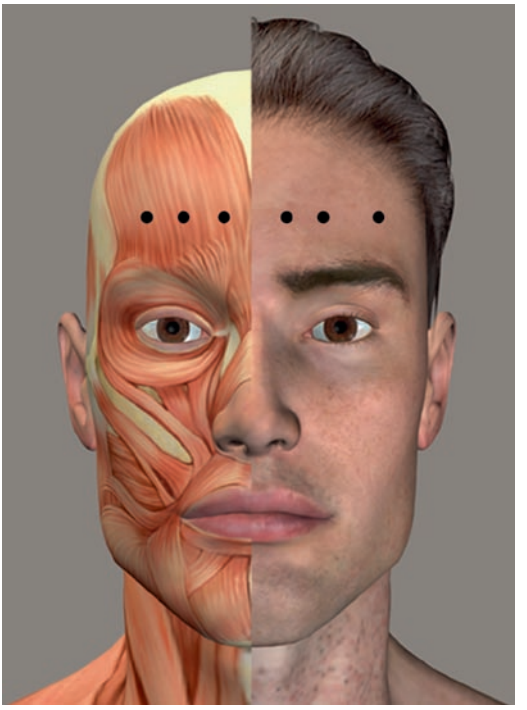


Fig. 8.4 Distribution of injection points for the treatment of the forehead.

8.3.2.2 Mephisto Sign

The "Mephisto sign," the elevation of the lateral eyebrows, at rest and at maximum frown, should be avoided as it leads to either a weird or a more feminine look. The Mephisto sign occurs when the forehead treatment is restricted to the area between the mid-pupil lines. In this case, the lateral movement of the m. frontalis will produce more visible wrinkles or make the existing wrinkles more visible (Figs. 8.10 and 8.11a–c). The "Mephisto sign" may be carefully corrected with an injection in the point of maximum contraction when the patient raises the forehead. The injection point should be approximately 1 cm above the orbital rim. However, be aware that this additional injection point may lead to brow ptosis.

8.3.2.3 Residual Upper Eyebrow Wrinkles

In some patients, when the total forehead is treated, some residual small wrinkles above the eyebrows may persist. Here microinjections of small dosages of BoNT-A (approximately 2–3 Dysport® U or the equivalent of Botox® U) might be helpful. A low dosage is mandatory to avoid brow ptosis. As a brow ptosis frees alternatively, the superficial injection of appropriate nonpermanent injectable filler (e.g., hyaluronic acid or collagen) might be recommended.

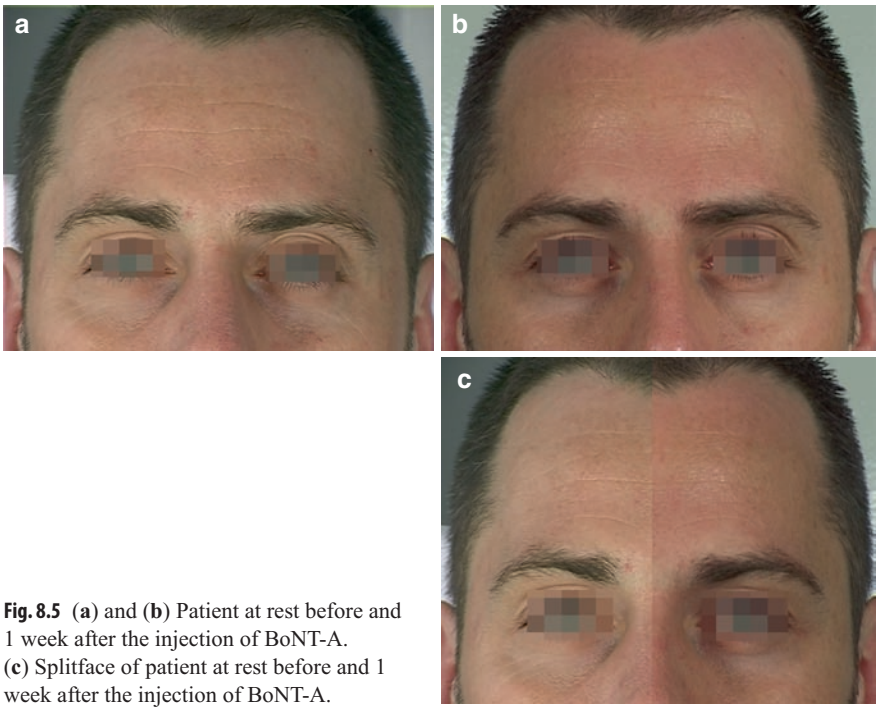


Fig. 8.5 (**a**) and (**b**) Patient at rest before and 1 week after the injection of BoNT-A. (**c**) Splitface of patient at rest before and 1 week after the injection of BoNT-A.

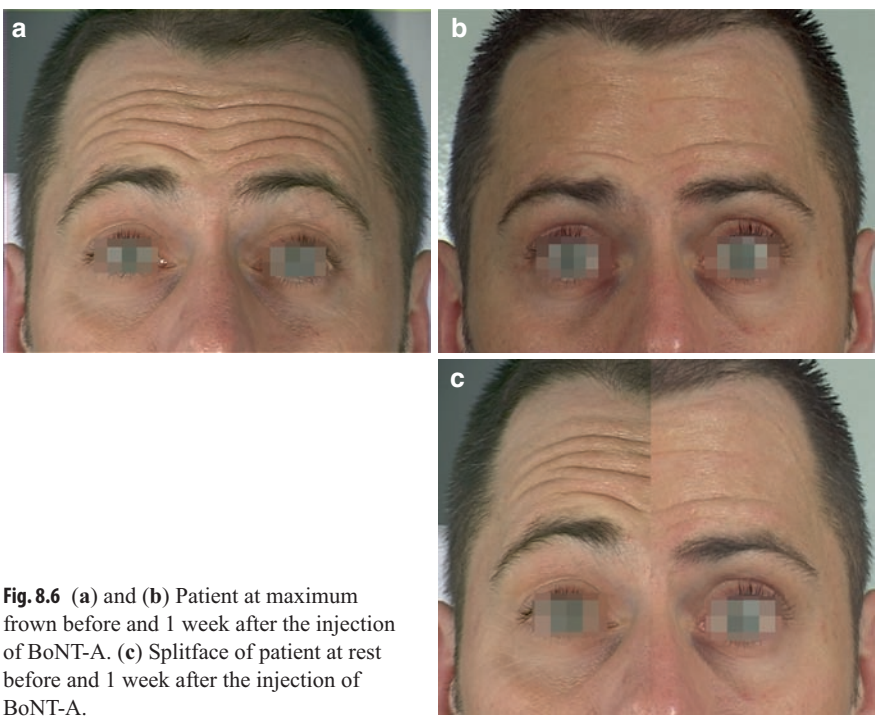


Fig. 8.6 (**a**) and (**b**) Patient at maximum frown before and 1 week after the injection of BoNT-A. (**c**) Splitface of patient at rest before and 1 week after the injection of BoNT-A.

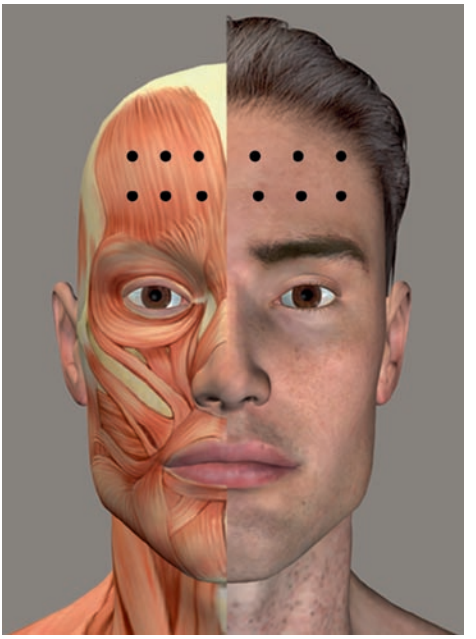


Fig. 8.7 Injection points in patient with shaved head.

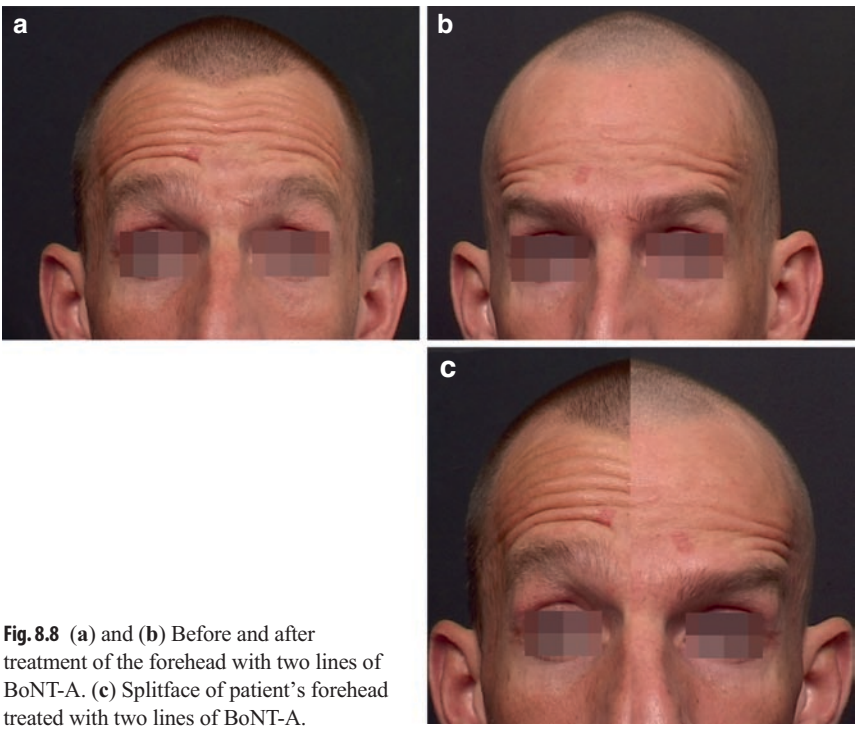
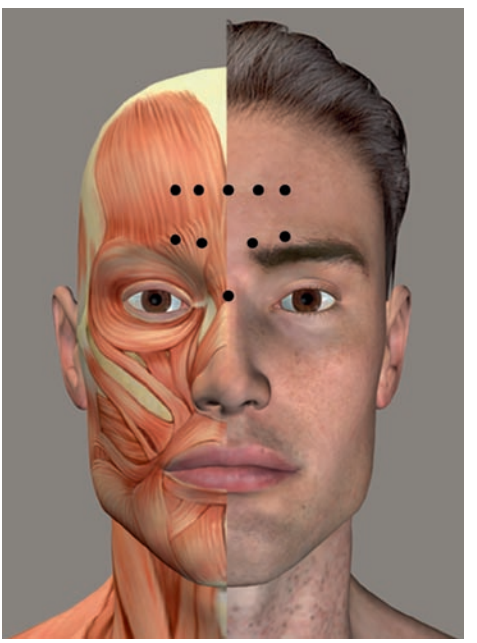


Fig. 8.8 (**a**) and (**b**) Before and after treatment of the forehead with two lines of BoNT-A. (**c**) Splitface of patient's forehead treated with two lines of BoNT-A.

Fig. 8.9 Splitface of patient forehead treated with one line of BoNT-A. Pronounced eyebrow ptosis when frowning due to already increased elastosis.

Fig. 8.10 Injection points that increase the possibility of a Mephisto sign.



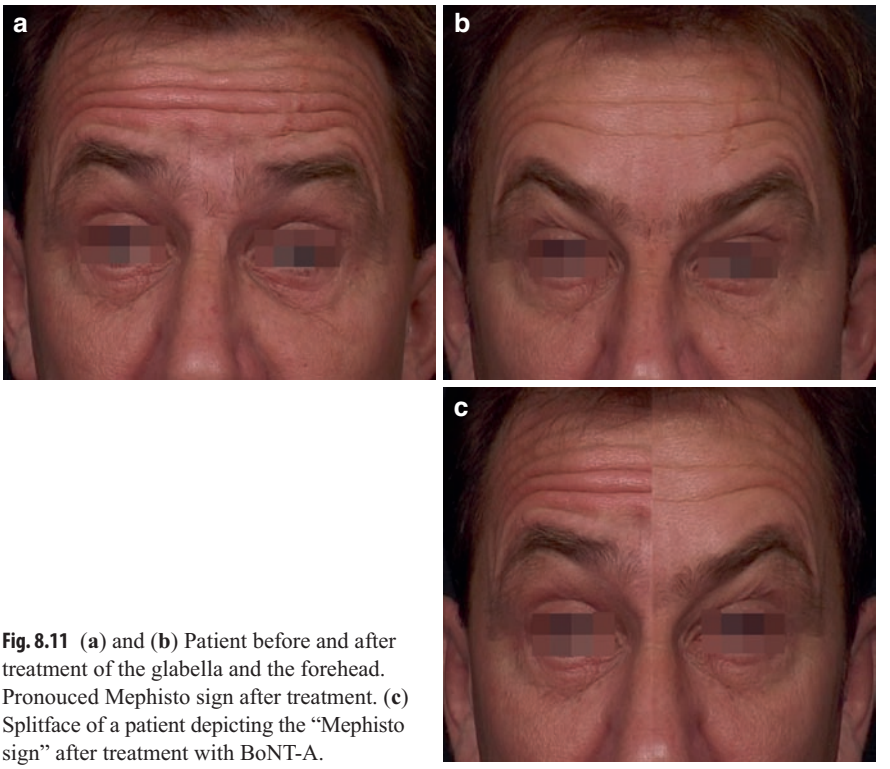


Fig. 8.11 (**a**) and (**b**) Patient before and after treatment of the glabella and the forehead. Pronouced Mephisto sign after treatment. (**c**) Splitface of a patient depicting the "Mephisto sign" after treatment with BoNT-A.

8.3.3 Glabella

Besides the forehead, these areas are the most treated areas in men. Although the injection points do not differ between men and women for these indications, the muscles might cover larger areas requiring additional injection points.

Glabellar lines are created by three muscles: the m. depressor supercilii, m. corrugatores, and the m. procerus. All muscles interact together, but show distinct features, for example, the m. depressor supercilii draws the eyebrows down; the m. corrugator supercilii leads to the vertical lines between the eyebrows; and the m. procerus induces a horizontal line between the eyebrows.

8.3.3.1 Standard Injection Points

BoNT-A is distributed through five injections points in the glabella area, covering all three muscles involved in the formation of the glabellar lines. The central injection point is used to treat the m. procerus. The more lateral points will treat the corrugator

muscles as well as parts of the m. frontalis. Usually the distribution of points is "swallow-shaped." No injection points should be placed below the orbital rim (Figs. 8.12, 8.1c, d, and 8.2c, d).

8.3.3.2 Individual Injection Points

In some patients, the corrugator muscle might be quite extensive covering larger parts of the forehead. In these patients, additional injection points might be placed superior to the standard points (Fig. 8.13a, b).

8.3.4 Complications of the Glabella Treatment in Men

8.3.4.1 Under-Treatment

Under-dosing or using fewer injection points might lead to insufficient results. Although a careful approach is always recommended, obvious under-treatment should be avoided (Fig. 8.14a, b).

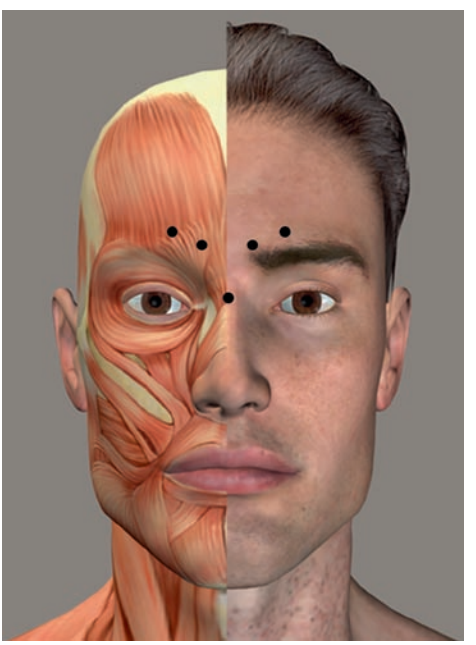


Fig. 8.12 Standard injection points for the glabella.

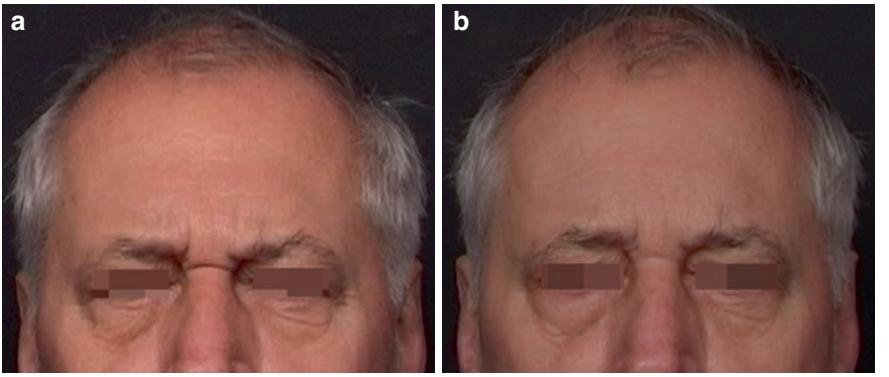


Fig. 8.13 (**a**) and (**b**) Patient with extensive corrugators before and after treatment with BoNT-A requiring additional injection points.

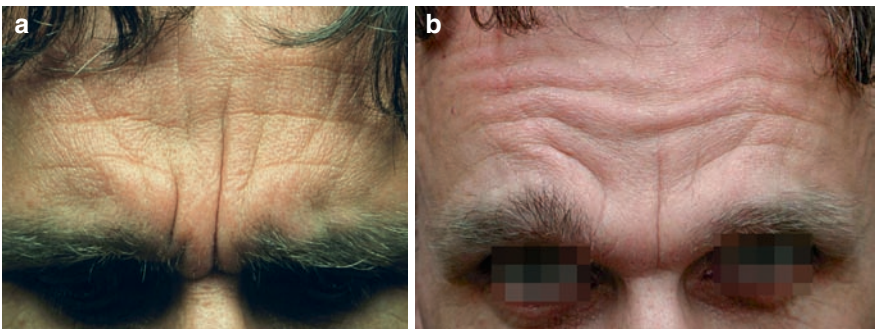


Fig. 8.14 (**a**) and (**b**) Under-treatment resulting in an insufficient result in the glabellar area.

8.3.4.2 Eyelid Ptosis

Especially when using higher dosages, eyelid ptosis might occur (Fig. 8.15a, b). Usually, even without treatment, it subsides during a couple of weeks. Apraclonidine, an α2-adrenergic agonist, can be used to decrease the severity of lid ptosis by stimulating the Mueller's muscle. The most common dosing scheme for apraclonidine 0.5% eye drops is one or two drops up to three times daily into the affected eye until ptosis resolves. Similar agents for the treatment of ptosis include brimonidine (0.1% or 0.2%) and neosynephrine hydrochloride (2.5%) (Scheinfeld 2005).

8.3.5 Crow's Feet

Crow's feet patterns might vary considerably between different patients. Even in one patient, crow's feet on one side might differ from the crow's feet on the other side. Therefore, the treatment of crow's feet often requires an individual approach.

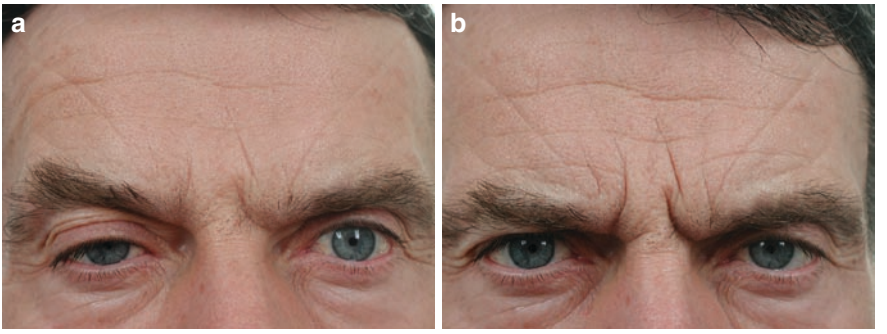


Fig. 8.15 (**a**) and (**b**) Patient at rest before and 2 weeks after BoNT-A. Lid ptosis on the *right side*.

8.3.5.1 Different Patterns of Crow's Feet

Two muscles determine the appearance of the crow's feet: the m. orbicularis oculi and the m. zygomaticus major. The orbicularis oculi is composed of three portions: orbital, palpebral, and lacrimal. The orbital portion forms the majority of the muscle bulk. With normal muscle function, maximal orbital closure depends on the concentrated effort of all three portions of the m. orbicularis oculi. The contraction draws the skin and eyelids medially toward the bony attachments, which leads the lacrimal flow from the laterally and superiorly placed lacrimal gland toward the inferiorly and medially placed lacrimal sac. The m. zygomaticus major is one of the major muscles of the cheek area. It retracts and elevates the modiolus and the angle of the mouth. By elevating the corners of the mouth, some horizontal suborbital lines may appear.

Depending of the extent of crow's feet, the injection points might be distributed differently. Usually three injection points approximately 1 cm apart from the orbital rim should be sufficient (Figs. 8.16 and 8.17a, b). However, in a patient with lack of wrinkles in the lower third, only the middle and the upper third need to be treated, respectively, and in a patient with lack of wrinkles in the upper third, only the middle and the lower third need to be treated. Therefore, in these patients, two injection points might be sufficient (Fig. 8.18a, b). The crow's feet area is an area where microinjections especially in the lower wrinkles might be useful, because by very superficial injections, an involuntary treatment of the zygomaticus muscle may be avoided.

8.3.5.2 Complications of the Treatment of Crow's Feet in Men

The crow's feet area is usually a very safe area. However, some adverse event may occur. Bruising might be quite common.

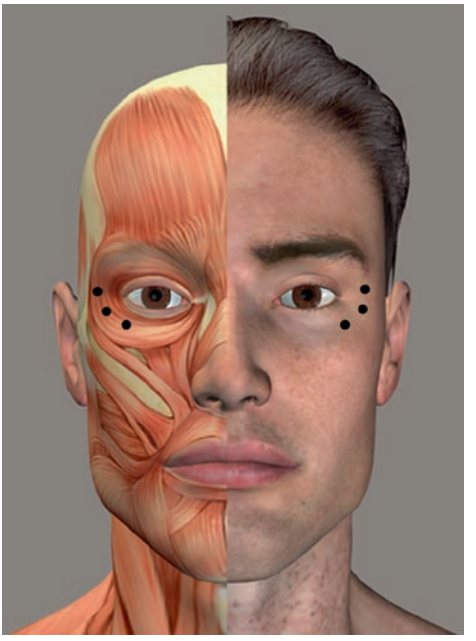


Fig. 8.16 Standard injections points for crow's feet.

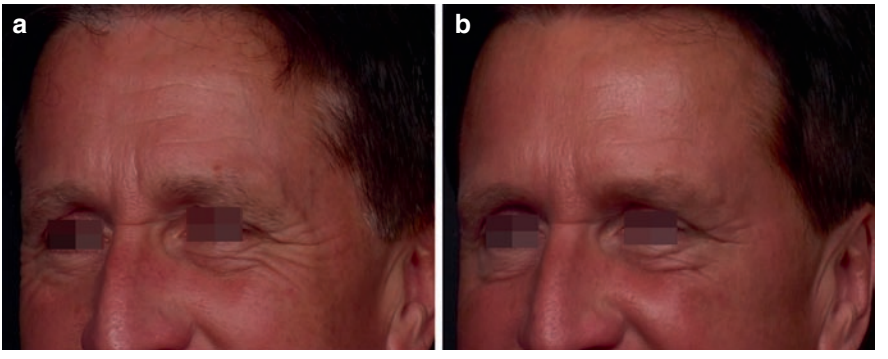


Fig. 8.17 (**a**) and (**b**) Patient before and after treatment with three standard injection points (total dosage of 30 Dysport® U per side) in the crow's feet area. Please note that some of the lower eyelid wrinkles remain.

8.3.5.3 Under-Treatment

Under-treatment is not a real adverse event. It may occur in patients were parts of the m. orbicularis oculi remains untreated. In these cases, an extra injection point will be needed for smoothing out the remaining wrinkles.

8.3.5.4 Zygomatical Involvement

The zygomaticus may be involved twofold. If the zygomaticus is treated involuntarily, the upper lip may drop, leading to an asymmetric appearance. On the other hand, in patients with a perfectly treated m. orbicularis oculi in the suborbital area, some horizontal lines may appear, thanks to a strong contraction of the zygomaticus (Fig. 8.19a, b). In this case, it is better to leave the patient untreated, as a decrease in the activity of the zygomaticus muscle might lead to the drooping of the upper lip (Table 8.4).

8.3.6 Other Areas

So far, most men are treated in the area of the upper face. However, some men also require treatment of the middle and lower face. The rules for the treatment of these areas in men are not different from the rules for women and Table 8.5 gives a summary. For the exact injection points, we refer to our second book on botulinum toxin A (de Maio and Rzany 2007).

8.4 Topical Botulinum Toxin A

There has been some attempt made to investigate the effectiveness of topical BoNT-A. There is one study focusing on female patients who did see some effect after the continous application of a cream, where BoNT-A (2 U of Botox® per 1 mg of cream) was added at the beginning. Based on the published photographs, the results after a total of 50–70 Botox® U and a treatment duration of 4–7 weeks are not at all convincing (Chajchir et al. 2008). If topical BoNT-A would really work comparable to injected BoNT-A, safety would be a concern.

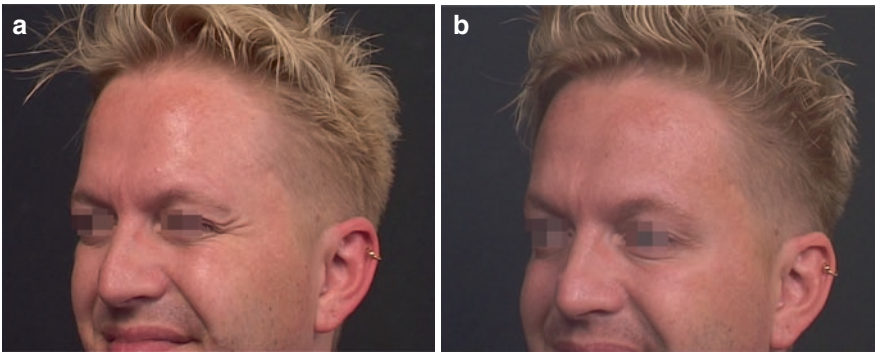


Fig. 8.18 (**a**) and (**b**) Patient before and after treatment with two standard injection points (total dosage of 20 Dysport® U per side) in the crow's feet area.

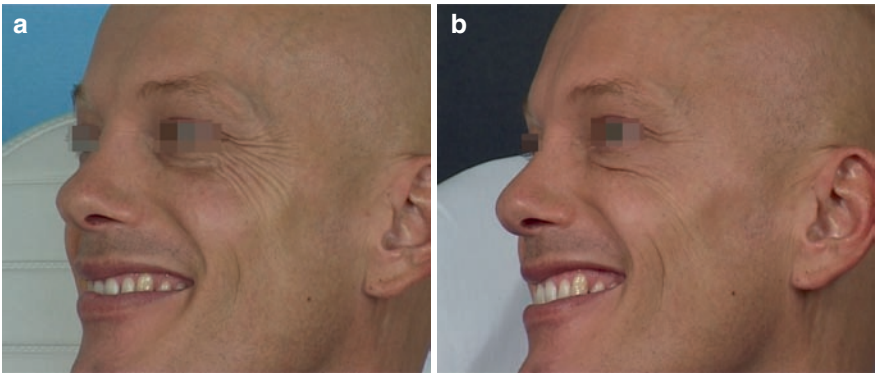


Fig. 8.19 (**a**) and (**b**) Residual wrinkling before and after treatment with three standard injection points in the crow's feet area. The residual wrinkling is due to the activity of the m. zygomaticus major. Treatment of the residual wrinkling would lead to a ptosis of the upper lip.

Do's

- Be careful in first-time patients. It might be better to under-dose during the first visit and find the optimal dose during the subsequent visits.
- Adjust the dosage depending on the size of muscle treated and the kinetic pattern.

Don'ts

- Do not touch the periosteum when treating the forehead or the glabella - it will just hurt and will not increase efficacy.
- Do not keep the lateral forehead points to medially – otherwise patients will look feminized.
- Do not under-dose when it is not necessary. Otherwise you will have unhappy patients.
- Be careful when you inject large dosages per injection point: think of decreasing the dilution volume.

Key pointers

- Most injection points do not differ between men and women.
- Dosages may, however, differ as some men might need higher dosages.

FAQs

How should I inject a man in whom I suspect will need a higher dosage?
There are two possibilities: (1) you inject the higher dosage. If the patient is satisfied, it certainly was the right dosage. However, you will never find out if a lower dosage would have been sufficient either. (2) You start with the standard dosage and reschedule the patient approximately 2 weeks later. If the initial dosage was not sufficient, for example, the patient still shows considerable muscular movement, the patient should be reinjected with a couple of more injection points to determine the right dosage.

Table 8.4 Indications for botulinum toxin A therapy and range of dosages for the upper third

Indication	Muscle(s) to be treated	Injection points	Botox®/Vistabel®	Dysport®/ Azzalure®	Comments
Forehead lines	M. frontalis	Varies from 4 to 6 per line, the lateral points should parallel the corners of the eye	20–30 U	40–60 U	One line is appropriate in most men, in men with a large forehead or bald patients two lines might be appropriate
Glabellar lines	M. corrugator supercilii and M. procerus	3–5	20–40 U	50–70 U	Full blocking is desirable
Crow's feet	M. orbicularis oculi	3–5 per side, please note that if the microinjection technique is used, more injection points may apply	6–15 U (per side)	15–30 U (per side)	The lower fibers should be injected at a very superficial level to avoid an unwanted co-treatment of the zygomaticus muscles

Please note that in men the higher end of the dosages is usually more appropriate. The lateral brow lift is not included as this indication is usually never requested by men (Fig. 8.20). Xeomin dosages should be in the range of Botox dosages.

Table 8.5 Indications for botulinum toxin A therapy and range of dosages for the middle and lower third

Indication	Muscle(s) to be treated	Injection points	Botox®/ Vistabel®	Dysport®/ Azzalure®	Comments
Drooping nasal tip	M. depressor septi nasi	1 or 2	1–3 U (per side)	3–6 U (per side)	Either a single injection point at the columella or two points, each side of the medial crura
Excessive opening of the nasal flare	M. dilator nasi	2	1–3 U (per side)	3–6 U (per side)	At maximum of muscular movement
Bunny lines	M. nasalis	2	1–3 U (per side)	5–10 U (per side)	Very superficially, preferably into its medial part
Gummy smile	M. levator labii superioris	2	2–3 U (per side)	5–7 U (per side)	Injection at the bulging area at the most upper part of the nasolabial fold
Cheek lines	M. zygomaticus major	Only microinjection technique!	1–3 U	3–9 U (per side)	Potential under-dosing during the first visit may be desirable
Elevation of the corners of the mouth	M. depressor anguli oris	2 (both sides)	5 U (per side)	10 U (per side)	Very important to correct a "sad mouth appearance." This area may benefit from the combination with fillers
Cobble stone chin	M. mentalis	1 or 2 (both sides)	4 U (per side)	10 U (per side)	One central point or two more lateral points
Platysma medial bands*	Platsyma	3–6, approx. 1.5 cm apart	10–30 U	30–60 U	Superficial if no fat content and deeper with fat deposits in the neck
Platysma lateral bands*	Platysma	3–6, approx. 1.5 cm apart	20–40 U	40–80 U	Same as above and the most important depressors that drop the face

Please note that in men the higher end of the dosages is usually more appropriate. Dosages for indications like the upper and lower lip are not included as they are almost never requested by men (Fig. 8.21). Xeomin dosages should be in the range of Botox dosages.

*Rarely treated in men

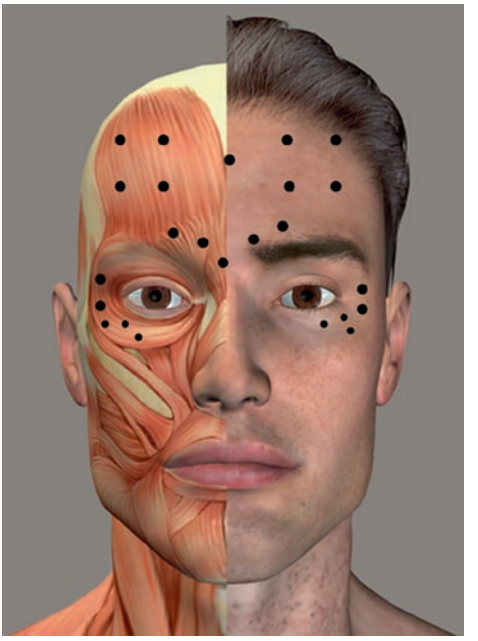


Fig. 8.20 Distribution of injection points for the upper face.

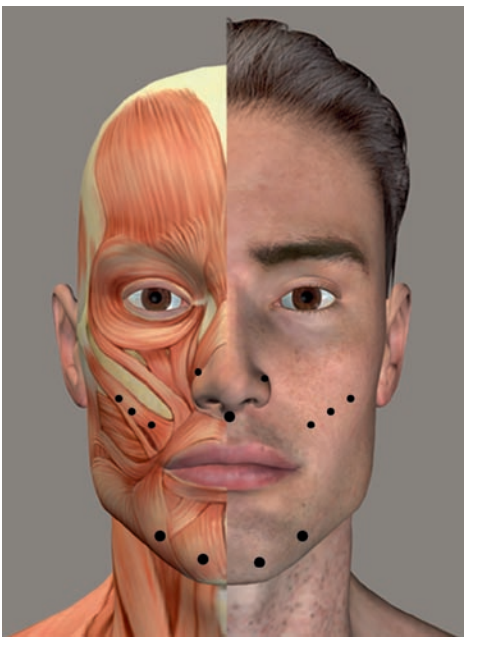


Fig. 8.21 Distribution of injection points for the middle and lower face.

How should I proceed in man who requires larger dosages?
To avoid injecting large volumes per injection point and by that theoretically induce a higher risk of adverse events, you might consider injecting a less diluted toxin (see Tables 8.1 and 8.2).

Where should I inject when I treat the forehead? Should I inject in the belly of the muscle or following the lines?
It does not matter much. Injection points should be in the middle of the forehead. Theoretically, it is better to inject in the biggest part of the muscle (the belly); however, a standard dose of BoNT A (4 Botox® or 10 Dysport® U) injected in a volume of 0.05 mL will usually diffuse approx. 1 cm around the injection point - therefore it does not really matter.

When should I use the microinjection technique?
The microinjection technique, for example, injecting very superficially small dosages of BoNT-A, should be used in tricky areas where larger dosages or a deeper injection would increase the risk of adverse events. Examples for such areas are residual wrinkles after incomplete forehead treatment and crow's feet extending to the cheeks.

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Fillers

9

Mauricio de Maio

9.1 Introduction

Over the past decade, the use of nonsurgical products and devices has exploded, with new lasers, toxins for muscle relaxation, and dermal fillers revolutionizing aesthetic medicine. The most explosive element has been within the dermal filler industry. This is resulting in large part from new products, particularly the hyaluronic acid (HA) products that now promise greater longevity, fewer side effects, a more natural appearance, and easier administration. Commonly used for treating static rhytides and each time more indicated for volume replacement, injectable fillers have become one of the best weapons for nonsurgical minimal invasive cosmetic procedures. It presents few complications and little-to-no downtime.

Although men have traditionally been more reluctant than women to undergo cosmetic or rejuvenating procedures, over the past few years, there has been a significant increase in the number of noninvasive procedures performed in men. The development of no-downtime, nonsurgical, office-based procedures have stimulated fresh interest among men who are unwilling to tolerate invasive surgical procedures because of the inherent postoperative morbidity and downtime. When assessing a male patient, it is important to establish the desired treatment goal, whether it is the reduction of photoaged cutaneous wrinkles, improvement of dynamic wrinkles related to muscle activity, or the replacement of volume loss involving the cutaneous and deeper facial structures.

The traditional concepts of soft-tissue descent associated with ageing, for which surgical lifting procedures was the solution, have been supplemented with the knowledge that the initial phase of descent is often a manifestation of regional volume depletion. And because a major etiology of clinical appearance of the ageing male face is volume loss, replacement of this lost volume can restore natural characteristics of the youthful face. Filling can augment and even replace or delay surgery in selected cases. Volume replacement by injectables can give the appearance that the area has been lifted, despite the fact that no actual surgical lifting has been performed.

M. de Maio and B. Rzany, *The Male Patient in Aesthetic Medicine*,
DOI: 10.1007/978-3-540-79046-4_9, © Springer-Verlag Berlin Heidelberg 2009

9.2 The Role of Injectable Fillers

Dermal and subcutaneous fillers substances like collagen and hyaluronic acid (HA) products are used to recreate a more youthful-appearing face. These products restore the collagen protein scaffolding and moisture, respectively (Kher 2003). Collagen, one of the earliest fillers, may be derived from bovine, porcine, or bioengineered human sources. Hyaluronic acid, now the most popular filler, may be derived from both avian and bacterial sources. Other synthetic products include polylactic acid, for use in subdermal volume replacement and polymethylmetacrylate. There are many other different devices, but by far the most popular are the HA fillers. They may be considered tissue expanders and can also be used to increase symmetry and balance facial proportions. Throughout the face, they can be injected to raise eyebrow, reshape the nose, lift the nasal tip and the oral commissures, soften nasolabial folds, fill in hollowed-out cheeks, project cheekbones, and contour the jawline (de Maio 2004).

There are now over 100 known agents used worldwide that are considered soft-tissue fillers. It is critical to establish safety and efficacy, which the majority of such substances lack. Safety studies are used to substantiate the cosmetic application of such agents and also helps define the adverse events' profile and purity of them (Klein and Fagien 2007). Technique subtleties include the angle at which the needle should penetrate the skin and the depth the material should be inserted. The actual volume per injection point is minimal but higher in male patients than in females, exception is made to autologous fat (Chap. 11). Depth varies from device to device, with temporary fillers being targeted at the upper levels of the dermis and the more permanent devices being injected deeper into the dermis or into the subcutaneous plane.

9.3 Hyaluronic Acid

The rationale for use of hyaluronic acid products, for instance, relates the fact that the substance is ubiquitous in human tissue. Commercially, they are derived from avian and bacterial sources. Their usefulness for aesthetic indications is achieved through cross-linking and modifications in the chemical structure to substantially increase residence time and persistence of clinical effects in tissues.

The differences in all the properties of the various hyaluronic acid agents include factors such as injectability, tissue reactions and edema, palpability, differences in source, particle size, cross-linking, and concentration.

Although all HA fillers are derived from the same HA polymer, all products are not the same. There are differences in particle size, degree of cross-linking, percent cross-linking HA, G′ (elastic modulus) or hardness index-free (soluble) HAs present, and the degree of hygroscopic equilibrium among fillers. The clinical performance, such as the degree of tissue filling, longevity, natural appearance, and adverse event profiles, are dependent on the physical and chemical properties. Cross-linking the HA gives the product

greater stability and longevity. As the degree of cross-linking increases, a liquid will become first a gel and then a solid. A higher degree of cross-linking results in a greater degree of resistance and that will affect degradation in the body. Too much cross-linking can be problematic. By increasing gel viscosity to a point that requires a great extrusion force to expel the product through the needle will create significant tissue trauma (Monheit 2005).

The HAs are ideal fillers for mild-to-moderate nasolabial fold. Superficial folds should be injected into the mid dermis, with a linear or serial puncture technique. Moderate folds are best treated if injected into deeper dermis and multilayers in a linear threading or fanning technique. Gentle pressure of the needle tip through the skin surface is followed by forward pressure. A sudden decrease in tissue resistance implies that the needle tip has descended too deeply and it must be withdrawn and repositioned before the material can be deposited. Depending on the polymer size, the injection should be done in different layers, so that superficial, intermediate, and deep wrinkles or folds can be treated adequately. In general, male skin is thicker and harder when compared with female patients. So, male patients may require more volume to provide appropriate correction mainly in the nasolabial fold.

Among all the commercial products, Juvedérm® Ultra with 0.3% lidocaine can be considered as a new generation of fillers. The fact that the lidocaine reduces pain during injection leads to a very high acceptance of this filler in male patients.

Lumps after HA injections may be caused by focal abundance of material or inflammatory nodules that may be a result of less precise, forceful injection of these agents. Spending time during injection seems to be more efficacious than massaging after the procedure. Postinjection massage frequently results in a decreased final correction because of the forceful displacement of the material deep both peripherally and into the subcutaneous space. Treating lumps and misplaced HA became simple and convenient due to the availability of hyaluronidase (Brody 2005).

Key pointers

- Natural HA has a half-life in tissue of only 1–2 days.
- Before choosing an HA filler, the physician must first diagnose the type, location, and cause of the facial ageing problem to be corrected.
- If the HA class of fillers is being considered, one must evaluate the depth of the fold or wrinkle, the area to be treated (eyelid skin vs. nasolabial fold), the amount needed, prior treatments, allergies, pain tolerance, downtime, and financial impact).
- Male patients usually require more volume to improve areas such as the nasolabial fold when compared with women. Dermal thickness and hardness may account for that.
- Inflammatory nodules can be related to forceful implantation techniques.

Do's

- Do inject male lips with HA products. The lack of vermillion gives a senile appearance to the lips.

Don'ts

- Do not over treat male patients with HA, because owing to its hygroscopic property, it will result in undesirable swelling and do not under-treat male patients with HA. It is very likely that male patients will feel that the procedure did not work.

FAQs

What are the most important physical and chemical properties of the HA gel?
The important characteristics are as follows:

- Gel hardness (G′) or rheological (flow) properties, as measured by stored energy, deferred upon passage through a syringe and then restored to an expanded viscoelastic state.
- Particle size within the gel.
- Concentration of HA particles per millilitre of gel.
- Swelling, or the gel's ability to resist dilution, and thus a factor of filler longevity.
- Soluble vs. insoluble HA, a function of particulate vs. fluid components.
- Cross-linked vs. free HA.

Why do some HA products result in greater swelling after the injection?
All HA products are hygroscopic, which means a capacity to bind water. Some are already saturated with water and are in equilibrium hydration prior to injection. Others are below equilibrium hydration and thus absorb tissue fluid after injection. Equilibrium hydration can be a desirable property, as it gives back to the tissue fluids that have decayed with ageing skin. It also causes greater swelling and more inflammation than that seen with initial injection.

What are the most common indications for HA treatment in men?
The most common indication include nasolabial folds, marionette lines, mandibular chin reshaping, forehead and glabella, acne scars, volume augmentation, including sculpting of cheek bones and tear troughs.

9.4 Collagen

Collagen-based devices are normally injected into the upper dermis. The most common products derive from bred cows, porcine sources, and bioengineered human skin cells represented commercially by Zyderm® (I/II) and Zyplast®; Evolence®; and Cosmoderm®/Cosmoplast®, respectively. Depending on the viscosity of the product, the cross-linking and polymer size, the correct inject depth should be chosen. As a general rule, Zyderm® I and II and Cosmoderm® are to be injected more superficially and need overcorrection from 150% to 200%, while Zyplast® and Cosmoplast® are to be injected into the reticular dermis and overcorrection should be avoided (Klein 2001).

Male skin is usually thicker than female skin, and the use of low viscosity collagen-based devices can cause disappointing results. Preferably, high viscous or collagen with extensive cross-linking should be used. Collagen is a good choice for lip contouring in male patients who need restructuring and not of much volume replacement.

Evolence® is a collagen-based filler with a long-lasting atelomeric collagen implant that is cross-linked with the natural sugar ribose, rather than with the formaldehyde/glutaraldehyde chemistry used in Zyderm®/Zyplast® and Cosmoderm®/Cosmoplast®. The product comes in two forms: Evolence® and Evolence® Breeze™. The latter product is less viscous and perfect for more superficial correction and lips.

Do's

- Do use a 27-Gauge needle with Evolence® and 30-Gauge with Evolence® Breeze™. If a 30-Gauge needle with Evolence® is used, the needle is likely to get jammed.
- Do avoid over-correction with Evolence® Breeze™ into necklace lines or perioral wrinkling even in male patients. Resulting papules could take months to resolve.
- Do massage collagen-based products to the desired state immediately after needle withdrawal to avoid unwanted long-lasting local excess fullness.

Don'ts

- Do not worry with subcutaneous or submucosal papules after collagen treatments. They may be found several days after treatment and disappear without any treatment in the first months.
- Do not use collagen-based products into areas of very thin skin such as the lower eyelid. Instead, use HA-based fillers that can be massaged and injected with hyaluronidase if needed.

Key pointers

- If a collagen-based dermal filler is to be used in male patients, select devices with high viscosity and extensive cross-linking.
- Male patients usually prefer collagen-based products that require no previous skin test due to busy schedules and numerous commitments.
- Although there is a specific lip product named Evolence® Breeze™, male patients usually present a very nice result with Evolence® for lip treatments.

FAQs

Is there any advantage at all to prefer collagen-based products rather than HA-based products in male patients?

Collagen stimulates the clotting cascade and so inhibits bleeding. HA inhibits clotting and can slightly increase the incidence of bleeding and subsequent bruising. So, to inject a male patient for the first time who is really concerned about bruising, collagen-based products are a good option.

9.5 Calcium Hydroxylapatite

Calcium hydroxylapatite is the inorganic component of bone. Beads (25–45 μm) of this substance is suspended in an aqueous gel and used as fillers in aesthetic medicine. Radiesse® is composed of calcium hydroxylapatite microspheres in an aqueous gel containing sodium carboxymethylcellulose and water. It is similar to the structure of bone that can induce radiopacities, which was thought to interfere with perioral X-ray studies. However, a recent study suggests that although visible the material cannot be confused with anatomical or pathological features (Carruthers et al. 2008).

To allow smooth flow and control, a 27-Gauge needle is the smallest size to be used (Sklar and White 2004). The needle should be inserted at an angle of 45° move through the dermis down to the subcutaneous layer. As the white suspension is injected into the deep, the carrier is gradually absorbed and the bioceramic spheres remain to enable new vessels and collagen formation.

The material should be deposited slowly and steadily withdrawn through the subcutaneous space to result in smooth and even product delivery. Small deposits of material in a retrograde tunnelling technique are advisable. Serial puncture may also be used, as long as under-treatment is done. It is important to avoid any injection into the upper dermis, and so the injection should cease before the needle is withdrawn at this level to avoid the formation of granuloma. As there is very little water associated with this inorganic substance, overcorrection should never be performed, because the initial effect will not recede as associated water is absorbed. This product is of a consistency that it can be molded soon after the injection with massaging. Until swelling subsides, any additional treatment should be delayed.

This kind of fillers is indicated for those male patients who have already experienced degradable products and are pleased with the result obtained. Nasolabial folds, marionette lines, cheeks, and chin are the best areas to treat with calcium hydroxylapatite. Lips are ideally not treated with calcium hydroxylapatite, but it can be used to elevate the corners of the mouth, especially in male patients. Nodules and granulomas have been described in lips and in highly movable facial structures (Roy et al. 2006). The most common complication is persistent nodule formation in 10% of patients who will require treatment either with incision and drainage or with intralesional steroid injections.

Do's

- Do under-treat any area when calcium hydroxylapatite is to be used as injectable filler.
- Do inform the patient that the product is radiopaque and the dentist should be informed when performing perioral X-ray studies.

Don'ts

- Do not apply strong massage or manipulation in the early post-injection phase to avoid migration.

Key pointers

- Male patients benefit from the use of calcium hydroxylapatite to elevate the corner of the mouth and to treat deep nasolabial folds. It provides a long-lasting treatment alternative for male patients who require multiple injections.

FAQs

What are the limitations of the treatment with calcium hydroxylapatite that should be thoroughly discussed with patients?
There is a long recuperation period with bruising, inflammation, and palpable consistency that may remain for months and sometimes during the full 1–2 years' duration of correction.

9.6 Polymethylmetacrylate

There are many different commercial presentations of devices that contain polymethylmetacrylate (Newplastic®, Metacryl®) microspheres at different concentrations. In general, 2% is for the fine lines, 10% for wrinkles, and 30% for very deep folds (canine fossa), nose, and chin reshape. Usually, it is advisable to perform a subdermal or subcutaneous fat injection with a 27- or 26-Gauge needle, unless the 2% device is to be used. Because of the viscosity of this device, great pressure is required and care should be taken to promote effective distribution of this product by moving the needle back and forth several times during the procedure (Lemperle et al. 1998). Products with higher concentration (30%) require the use of blunt cannulas and the use of a special pistol to inject them.

There are products that are made of homogenous 30–50 μm spheres of polymethylmetacrylate (PMMA) suspended in a vehicle system composed of 3.5% non-crosslinked bovine collagen (Artecoll™, Artesense™, and Artefill™). The bovine collagen serves as a vehicle and as a short-term volume filler that degrades in 2–3 months, whereas the nonresorbable PMMA microspheres induce a long-term foreign body reaction consisting of a fibrous collagen capsule that will result in long-lasting augmentation. The PMMA makes about 20% of the volume of the injection. The product should be injected below the dermis into the subcutaneous fat through a 26-Gauge needle. The material should be injected only at the subcutaneous level. A horizontal tunneling technique is best employed to restrict the placement of material deep to dermis. If placed too superficially, nodules will show through the skin. Longer-lasting correction is provided by nonbiodegradable products, but as ageing process continues, further treatments will be needed. Once full correction is achieved, additional treatment may be conducted after 4–5 years. These products should not be injected into the thin skin, such as in the crow's feet area, because the risk of visible papules in such areas is unacceptably high.

Overcorrection should be avoided and complementary injections should be undertaken after at least 45 days, but most commonly after 3–4 months. If too much material is administered in one site or if the treatment is administered too frequently, it is likely that the patient

will feel the product under the skin, rather than having the implant blend in imperceptibly. Nodules, granulomas, intermittent inflammation may occur, and so this type of device should be handled by experienced injectors. The bovine collagen requires a different skin test to rule out allergenicity. The PMMA beads are nonallergic, although reports of late granuloma formation have occurred, with both Artecoll™ and Artefill™ as rare complications (Thaler and Ubogy 2005).

In case of excess fullness or inflammatory reactions to PMMA containing products, intralesional injection of Kenalog® is advisable (typically 0.05 mL per injection session). Treatment may be repeated at monthly intervals until the desired result is obtained. Daniel Cassuto has presented interesting results in congresses of PMMA nodules removal with vascular lasers.

Do's

- Do explain to male patients that treatments with products containing PMMA may require multiple stages until the desired degree of correction is reached.
- Do take at least 3–4 months apart sessions when working with PMMA.

Don'ts

- Do not put too much material in a given location at once. Attempting to achieve full correction in a single treatment session increases the risk of complications.
- Do not repeat the treatments in a given area too frequently.
- Do not over-inject Kenalog® into skin nodules, because unwanted atrophy of surrounding tissues may result.

Key pointers

- PMMA containing products are popular among men because the gradual nature of the correction enables a high degree of control over the final result. The gradual stepwise correction is less likely to attract attention from friends and co-workers as well.
- The relatively thick skin of male patients makes it easier to administer a deep dermal filler with PMMA containing products.
- It is important to explain to male patients that PMMA remains in the skin permanently, but it is not a permanent correction but a longer-lasting one.
- If properly treated, the areas with PMMA gradually remodel with the rest of the face, and a natural appearance is maintained.
- The bevel of the needle should be placed downwards, especially in male patients with large pores.
- It is important to differentiate areas with excess fullness from granulomas and nodules.
- Male patients may be good candidates for PMMA containing products if they have prominent nasolabial folds without overlying flaccid, thin, or porous skin, which may show the implant and encourage migration.

FAQs

What is the adequate needle for injecting products containing PMMA?
As those are generally thicker products, adequate extrusion force is achieved with 25- or 26-Gauge needles. Extra-length needles are useful for the treatment of nasolabial fold, or areas of lipoatrophy, to avoid multiple skin needle insertions. The use of blunt cannulas (21- to 23-Gauge) makes the injection with PMMA very safe.

Should the injected area be massaged?
Yes. Immediately after the needle is withdrawn from the skin, the treated area should be massaged. Typically with one finger inside the mouth and one on the surface of skin, so that areas of excess fullness can be detected and massaged into the correct state.

Are granulomas and nodules common after the treatment with PMMA?
No, nodules and inflammatory reactions to PMMA are very rare.

What are the treatment options for unwanted nodules after PMMA injections?
Kenalog® injection, needle aspiration, curettage, surgical excision, and lately laser removal.

Among the advanced areas to be filled with PMMA, what area presents best performance in men than in women?
The slightly thicker skin of men makes the tear-trough area to have a better performance in men than in women, when PMMA is to be used as injectable filler in this area. However, only very experienced injectors should handle it and preferably with a blunt cannula.

9.7 Poly-L-Lactic Acid

The injectable poly-L-lactic acid (Sculptra®) is a lyophilized powder that must be reconstituted before use with at least 5 mL of sterile water for injection. Overnight hydration is advisable or the reconstitution should be made at least 2 h prior to the injection. The manufacturer recommends using the product within 72 h of reconstitution, but many physicians keep the product stored up to 2 weeks. To reduce the likelihood of blockages during the injections, a 26-Gauge needle is usually used. Multiple treatment sessions are required to achieve optimal results.

The product should be introduced into the deep dermal or subcutaneous plane and may be injected through tunneling (threading) or depot-type (serial) injections. A total of 0.1–0.2 mL of product is delivered per injection, and intradermal injection should be avoided by stopping the injection before needle skin withdrawal. Gentle massaging is advisable after the injection to avoid visible and palpable elevations of the skin followed by twice daily massage by the patient for 1 month (Orentreich and Leone 2004).

Although uncommon, potential risks are associated with dermal fillers. Excessive bleeding may occur, and so patients should be instructed to refrain from medications and

herbal supplements that impair clotting for 7–10 days prior to treatment. Patients with frequent cold sores, antiviral prophylaxis is recommended for perioral treatments.

9.8 Anesthesia for Injectable Fillers

Topical anesthetics, infiltration, and nerve blocking have been found helpful in making cosmetic procedures more pleasant and tolerable for male patients. Although, the vast majority of dermal fillers injections are undertaken under insufficient topical or under no anesthesia at all for women, it would be convenient to provide adequate analgesia for male patients. In most cases, topical anesthesia will provide sufficient anesthesia prior to the injection of dermal fillers. The stratum corneum is a strong barrier to absorption of drugs through the skin and it is usually thicker in male patients. The effect might be enhanced by rubbing dry gauze on the surface, which will also remove dead cells and grease. The oily content on male skin may also affect the anesthetic agent permeation. So, the use of a topical degreasing agent before the topical anesthetic is also convenient.

Cryoanesthesia is another physical means of inducing topical anesthesia. The simple application of ice bags may enhance the anesthetic effect. For some male patients, the single use of the ice bags already provides enough anesthesia. Male skin is generally thicker than that of a woman; when ice is used for reducing pain before filler injections, the ice should be held on the skin for about 15 min longer than that would be necessary in a similar location when treating a woman (Smith 2007).

Local anesthetics decrease or completely block sensitive as well as the autonomous and motor functions. Vasoconstrictors will decrease the absorption, enhance the availability of the local anesthetic to the nervous cells and thus, prolong the duration of action and decrease possible systemic effects. Direct inhibition of nerve ending excitation may be reached by infiltrative anesthesia. Generally, 1% lidocaine is the drug of choice and it is injected intradermally or subcutaneously. The intradermal injection has a rapid onset and longer duration, but it has the disadvantage of increased pain and distortion of tissues. The subcutaneous injection is less painful but lasts shorter. For very anxious male patients, topical anesthetics may be useful before the infiltrative anesthesia.

Nerve blocking is undertaken around a nerve and consequently anesthesia is obtained in the area where the nerve is supplied. As the volume of anesthetic used in these procedures is small, there is low risk of systemic toxicity. In contrast to the infiltrative method, there is no or almost no unbalance, with nerve blockings and less discomfort. However, this method requires good technical and anatomical knowledge to obtain optimal results with few injections and to avoid adverse events. For the nerve blocking, 1% or 2% lidocaine is usually used. The association of epinephrine with lidocaine is preferable when quicker and longer-lasting anesthetic response is required. Epinephrine should be avoided in patients with hypertension or cardiovascular diseases. It is not uncommon to have male patients with improper treatment for hypertension.

The *supraorbital nerve* exits the skull through the supraorbital foramen. A total of 0.5–1 mL lidocaine is injected right into the depression in the internal third of the eyebrows (supraorbital notch), with the needle pointed to the forehead. For the *supratrochlear nerve*,

0.5–1 mL of lidocaine is injected at the junction of the root of the nose and the upper rim of the orbit, just below the medial portion of the eyebrow. Both nerves can be blocked for the forehead and glabella treatments, respectively.

For the lower eyelid, nasolabial fold, upper lip, and part of the medial cheek and nose, the *infraorbital nerve* should be blocked. There are two ways of blocking it: cutaneous or mucosal approach. For the cutaneous injection, the needle should be placed 1 cm below the inferior orbital rim in the midpupillary line and 0.5 mL lidocaine injected around but not into the canal. Through the mucosa, the needle should be advanced through the superior labial sulcus aiming at the iris at the canine level. A total of 1 mL lidocaine should be injected with a retrograde technique. The needle control is undertaken externally with palpation. For the treatment of the lower lip and chin, 1 mL lidocaine is injected through the inferior labial sulcus, inserting the needle between the second and third inferior premolar aiming at the *mentalis nerve* foramen.

9.9 Forehead and Glabella

Although the forehead and glabella are the main areas to be treated by BoNT-A, there are some very deep lines that may benefit from the injection of fillers in male patients. The injection at the glabella is more frequently carried out in male patients than in women due to local anatomy and difficulties with the single treatment using only BoNT-A. Some folds will require a filler that can be more deeply injected (in the deep dermis or subcutaneous layer) to increase volume (Fig. 9.1a, b). Usually supratrochlear nerve blocking may be carried out or only topical anesthetic or even only ice bags. Retrograde tunnel technique allows a faster application. However, the multiple injection site technique can also be used. This technique will help to blend the filler better in the surrounding area. Deep and superficial forehead and/or glabella lines might require multilevel injections. Especially nonbiodegradable products or products with large particle size should be injected very carefully in the glabella area, as necrosis due to the occlusion of arteries

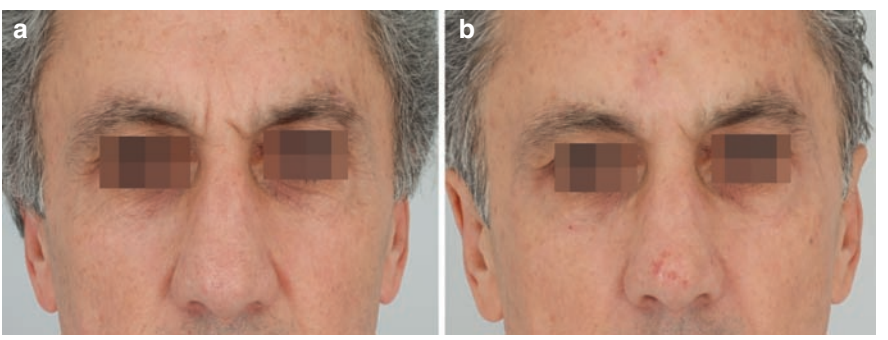

Fig. 9.1 (**a**) and (**b**) The result of injectable fillers into the glabella is very appropriate for male patients. A natural aspect should be the target.

has been reported. The use of blunt cannula decreases drastically the risk of complications at this level.

For male patients, the use of injectable fillers in the forehead is mainly for the treatment of any defect and rarely for treating wrinkles. The single use of BoNT-A usually suffices. However, injectable fillers into the glabella are quite frequent in male patients, especially for those who have very deep vertical or horizontal lines. Fillers provide an excellent mechanical barrier for those patients in whom the duration of BoNT-A has been short. This is mainly true for the hypertonic pattern.

9.10 Eyebrow

The use of fillers in the eyebrow of male patients is unusual but it does not mean that it cannot be necessary. Male patients may benefit from eyebrow treatment with injectables to correct minor asymmetries and to provide volume at the upper lateral portion of the orbit. Normal eyebrow position differs from men to women and this has to be taken into account when correction of the eyebrows is considered. In men, the arch must be smaller and lie slightly lower than that in women at the supra-orbital rim. Eyebrows also tend to be heavier in men than in women. This makes the use of filler for male patients to be undertaken with even more care to avoid upper eyelid edema. While injecting, it is advisable to stretch up the eyebrow and place the thumb on the upper eyelid to avoid migration of the product downwards. It is also advisable to have all the muscles acting at the eyebrow level blocked before the injection of fillers. Eyebrow filling usually does not require any topical anesthesia, local infiltration, or nerve blocking, even in male patients. Although the vast majority of fillers are for intradermal injections, biodegradable products can be injected into all layers beneath the eyebrow.

9.10.1 Cheekbones

Malar projection is an important hallmark for a youthful appearance even for male patients. Degenerative changes of the skin and atrophy of the underlying fatty tissue combined with deficient bone structure at the zygoma level may produce excessive deep folds and wrinkles in the midface. Fillers may be an important tool for correcting mild asymmetries (usually an indication for male patients) and for promoting augmentation in the cheekbones (Fig. 9.2a, b). The use of implants for male patients at the cheekbone level is frequent and fillers can also be useful as a pretreatment before surgery during the planning phase, and an alley to correct minor defects after surgery. However, the number of surgical cheek implants has been decreasing lately due to more frequent use of injectable fillers. Male patients usually prefer quick procedure with no downtime and injectables provide that.

The use of fillers for cheekbone reshape in male patients must obey specific rules: best results are obtained in patients with good midfacial fullness but insufficient malar projection

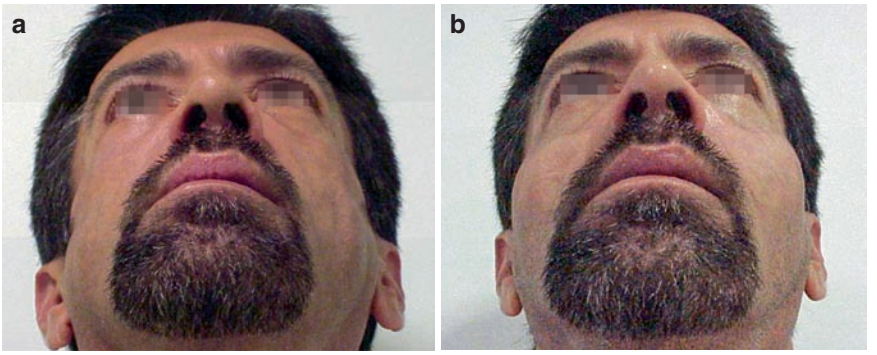

Fig. 9.2 (**a**) and (**b**) The use of injectable fillers into the cheekbones gives a nicer and stronger appearance for male patients. The volume requirement is not as high as it is for women in most of the cases.

with minor malar and submalar deficiencies. Another good option is for those young patients who have good malar bone structure but complain of early flatness of the midface. The advantage of treating male patients is that less volume when compared with women already provides very pleasant cosmetic results. The difficulty regarding male patients is the skin quality of the cheeks that may be considerably elastotic in male patients. Elastotic skin may be difficult to treat. Multiple sessions with hyaluronic acid may be useful to increase its consistency.

The use of large polymers is required at the cheekbone level. Both biodegradable and nonbiodegradable products may be used. Nonbiodegradable material should be injected deeper, though. If placed close to the periosteum, there is no lump formation and will not be palpable. It is preferable to inject with blunt cannulas in order not to avoid blood vessels. Usually, no anesthetic or only topic anesthesia is required for this procedure. Retrograde and multi-layer injections are usually preferable for a more uniform result. After filling all layers, a soft massage is conducted and a final analysis of the obtained projection is undertaken (Fig. 9.3a, b).

9.10.2 Cheek

Male patients may also require volume replacement in the cheek area. In case of moderate-to-severe fat reduction, the results of cheek filling are amazing. The cheek area volume replacement has become very popular in the past years. The issue is the volume requirement, which is very high. An alternative for male patients is to promote multiple sessions that will neither make the treatment evident nor unbalance the finances (Fig. 9.4a, b). Topical anesthesia is usually sufficient for this area. The area to be treated is usually drawn before. Retrograde injections are undertaken and placing the thumb against the cheek intra-orally may be helpful. Immediately after the fan technique, a smooth massage using both the thumb and the index finger will make the surface more uniform. It is preferable to

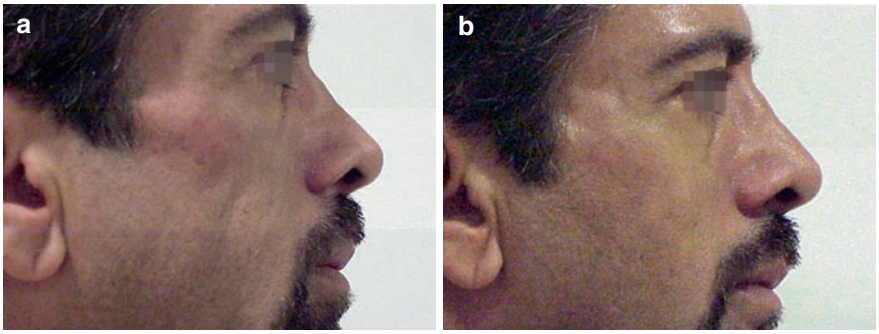

Fig. 9.3 (**a**) and (**b**) Volume replacement at the cheekbone level should include the zygomatic arch if needed. Over-treatment should never occur in male patients.

Fig. 9.4 (**a**) and (**b**) Patients should be warned that if cheek volume replacement is to be undertaken in a single session, edema is likely to persist up to 15 days. Normally, a multistep treatment is more advisable for the patient socio- and economically speaking.

choose high density polymers to provide adequate volume replacement. Either needles or blunt cannulas can be used for this procedure. Ecchymosis, edema, and temporary lumps may be seen after the cheek treatment.

9.10.3 Tear-Trough

The lower lid should be smooth, with no evidence of bagginess beneath the preseptal orbicularis muscle, and no delineation of the inferior orbital rim should be evident. Mild tear-trough deformities (infraorbital rim depression) are a good indication for fillers in male patients, which may improve the suborbital groove. By providing volume at this level, a healthier and younger appearance for male patients is obtained (Fig. 9.5a, b). Usually topical anesthetics are sufficient. Male patients should be treated with high density

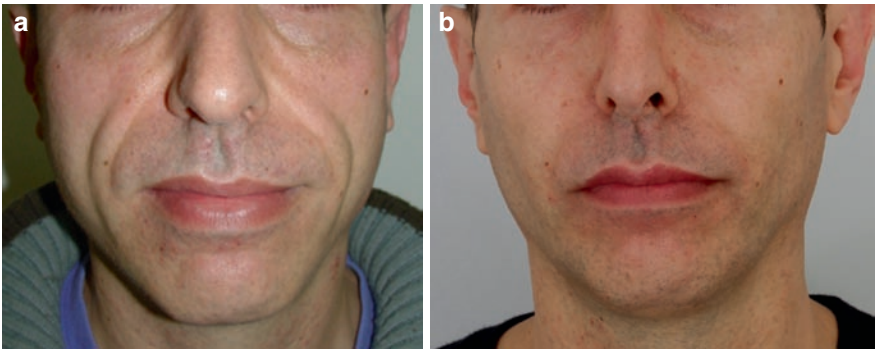

Fig. 9.5 (**a**) and (**b**) Severe facial lipoatrophy with lack of volume at the tear-trough, cheekbones, and cheek levels. A total of 15 mL was injected into these areas to obtain the pleasant result in the post-treatment period.

polymers, preferably biodegradable ones. It is advisable not to over-correct this area. If a nonbiodegradable product is to be chosen, the use of blunt cannulas is advisable. A careful approach is recommended as this area may lead to ecchymosis due to its vascularization and thin skin. It also may encourage nodule formation.

9.10.4 Nose

The possibility to reshape the nose with injectables with a quick recovery time has revolutionized the cosmetic area. Many male patients would never undergo a surgical nose reshape but would accept very openly to be subjected to nose reshape with injectables (Fig. 9.6a, b).

As the nose is quite a sensitive area, topical anesthesia might not be sufficient. Therefore, a block of the fibers of the ophthalmic and maxillary branch is recommended (Fig. 9.7a, b). Ideally, the dorsum should lie 2 mm in women and a little less in men posterior to a parallel line from the nasofrontal angle to the nasal tip. The nasolabial angle should be between 90 and 95° in men. When the dorsum is excessive, filling the nasofrontal angle and reducing its concavity may straighten the dorsum and the nose may look smaller (Fig. 9.8a, b). To lift the tip of the nose, the nasolabial angle should be filled at the level of the anterior nasal spine. Increasing nasal tip projection may be undertaken with direct injection into the domes. After treating the tip, injections must be done into the nasofrontal angle, onto the bone and cartilaginous dorsum, and into the nasolabial angle. To enhance the result of fillers, treatment with BoNT-A should also be combined. The depressor septi nasi is the most important muscle that acts on the tip and lip complex. It shortens the upper lip and drops the tip when smiling. By blocking up, lifting of the tip of the nose is also obtained.

Male patients with thin skin usually require less quantity of products. Biodegradable substances, although temporary, are the best one to start with. Male patients with thicker skins do not expand as easy as their thinner counterparts and usually require more product

Fig. 9.6 (**a**) This patient was unpleased with the aspect of his nose on the profile, but thought that a surgical procedure to correct it would be too much. (**b**) The patient enthusiastically accepted the nose reshape with fillers and became very pleased with the result.

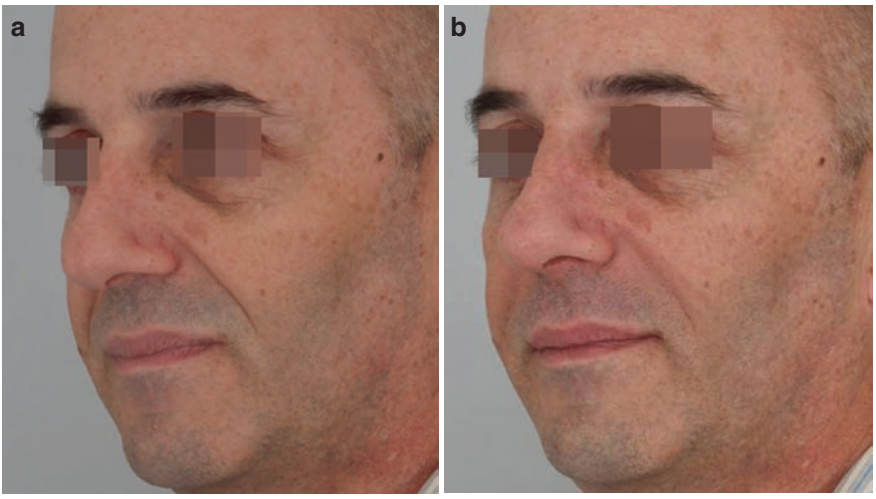

Fig. 9.7 (**a**) and (**b**) Pre and immediate after treatment of volume replacement into the nasolabial fold and oral commissure. A total of 2 mL of HA was used. For the nose reshape, 1 mL HA was injected into the nasal dorsum, the nasolabial angle, and into the tip of the nose. Nerve block was necessary for the procedure.

or larger molecules. Tissue expansion is easier on the bone dorsum and more difficult in the lower third. The injection of any substance into patients with oily skin and large pores may be followed by extrusion and loss of the product, and so injections should always be below the subdermis. Care should be taken with the vessels that pass in the subcutaneous tissue above the muscles.

If it is the first time to inject the nose, it is preferable to get experience with biodegradable products. Nonbiodegradable products are a good choice for long-lasting results, but care should be taken with blood vessels. A blunt cannula is always advisable here.

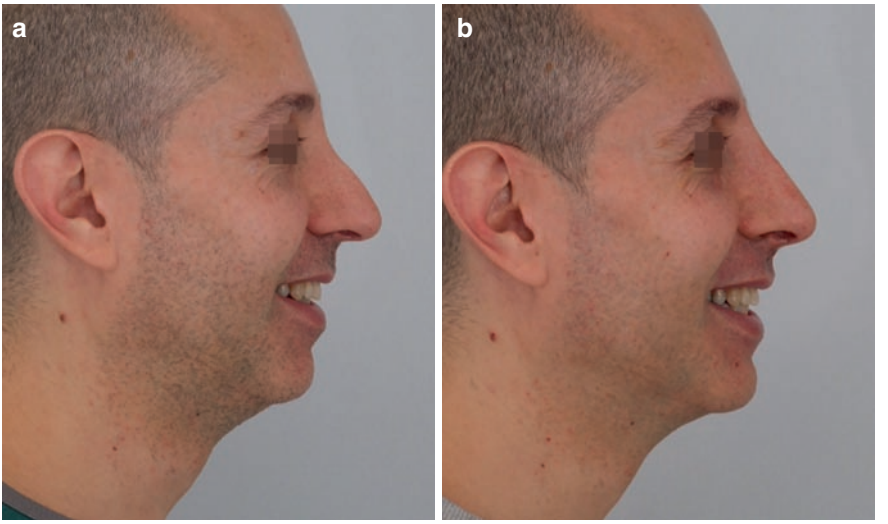

Fig. 9.8 (**a**) The profile of this patient was modified by the reshape of nose, upper lip, and chin. A total of 1 mL HA was injected into the nose, 0.6 mL was injected into the upper lip, and 1.5 mL was injected into the chin. (**b**) Note that after 15 days after the treatment, the frontonasal angle is still too shallow and will improve with time. The upper lip presents a nicer curve and the chin a better projection, improving the aspect of the submental area.

9.10.5 Nasolabial Fold

Nasolabial folds are one of the major indications for injectable fillers for male patients (Fig. 9.9). The amount of filler needed should be realistically estimated for the nasolabial fold, and unfortunately it is usually underestimated in male patients (Fig. 9.10a, b). It is common to have dissatisfaction because generally, 1 mL makes not too much improvement of prominent nasolabial folds (Fig. 9.11a, b). Best results are obtained in patients with none or mild saggy skin over the nasolabial fold (Fig. 9.12a, b). Although topical anesthesia may be applied, if the infraorbitalis nerve is blocked, male patients will feel much more comfort during the treatment. Usually, the injections should be performed more medially to the fold, either retrograde or serial. A multilevel approach is required, especially in male patients, with deep nasolabial folds (Fig. 9.13a, b).

There are folds that are induced by strong facial mimics and those induced by the ptosis of the SMAS. The depth of the nasolabial folds at rest correlates well with the tonus of the SMAS, while dynamic ones are related to muscles. Strong muscular tonus might lead to misdiagnosis and fillers are injected instead of BoNT-A, producing a “sausage-like” fold and fat appearance of the face (Fig. 9.14a, b).

Fig. 9.9 A difficult prominent nasolabial fold to treat with dermal fillers. If overly injected, a sausage-like appearance of the fold will result and the fold will still be deep. The solution here is to replace volume deep to the canine fossa, either with very high density HA or a high density nonbiodegradable filler, such as PMMA. The perioral area should be treated as a whole. Lip restructuring with HA and combination therapy with BoNT-A and injectable fillers.

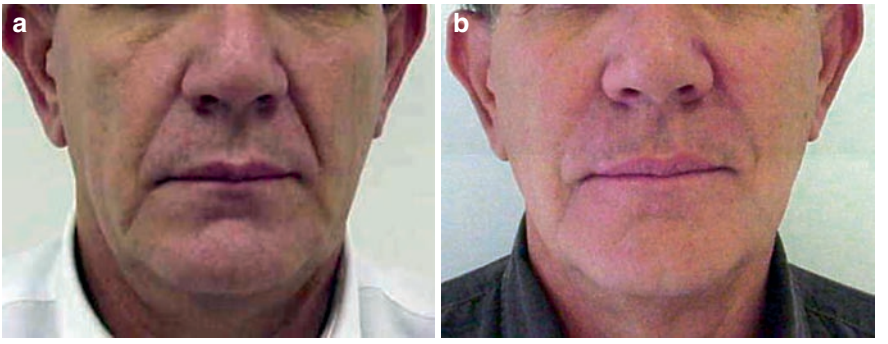

Fig. 9.10 (**a**) Male patients usually require more volume than women for the treatment of nasolabial fold and oral commissure. (**b**) The use of nonbiodegradable products is more adequate, although biodegradable fillers can also be used as long as enough volume is replaced.

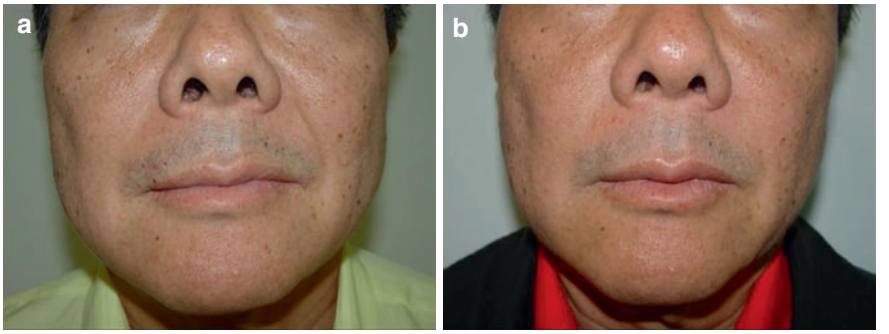

Fig. 9.11 (**a**) This patient has a moderate prominent nasolabial fold, which can be properly corrected with injectable fillers. The advantage of injecting is the low volume requirement. (**b**) After treatment of 2 mL HA.

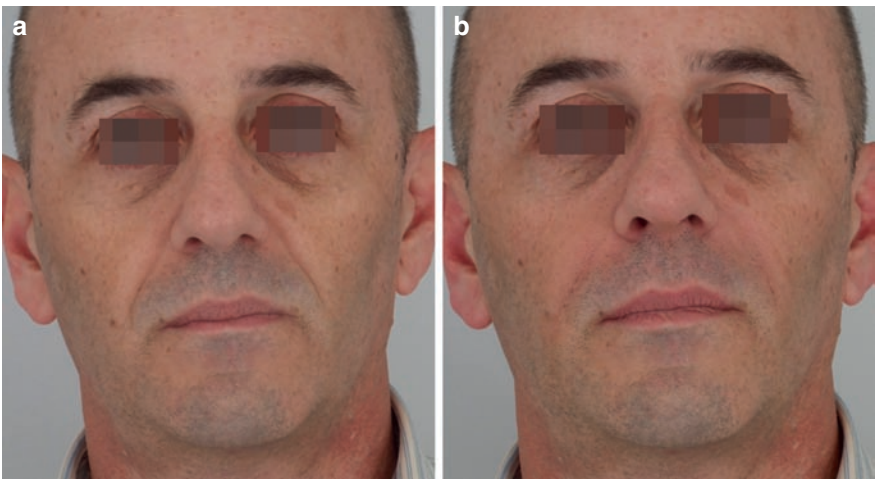

Fig. 9.12 (**a**) and (**b**) Before and immediate after result of the treatment of the nasolabial fold with the injectable fillers. Note that with a subtle camouflage, no evidence of the treatment can be perceived.

9.10.6 Lips

To believe that a male patient would not undergo lip treatments with fillers is not to be updated with cosmetic procedures. However, it is important to evaluate male patient's opinion to avoid dissatisfaction with unrealistic expectations. Fillers are very suitable for lip augmentation, improvement of perioral wrinkles, and lip contouring even for male patients (Figs. 9.15a–c and 9.16a–c). The lips cover more than the area of the red part of the mouth. They also include the skin adjacent to the vermillion. It must be considered as an anatomic unit with extensions superiorly to the nose and inferiorly to the chin. Many

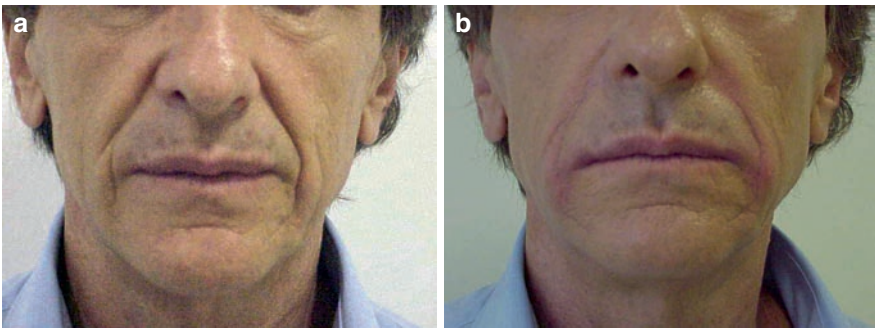

Fig. 9.13 (**a**) Patient with a severe nasolabial fold due to saggy skin. (**b**) Immediate result after the treatment of injectable fillers into the nasolabial fold and oral commissure. The volume used here was 3 mL in total.

Fig. 9.14 (**a**) Prominent nasolabial folds should be properly evaluated before treatment indication. If this patient was over-injected with injectable fillers, a "sausage-like" fold would probably result. (**b**) Partial volume replacement of the fold was the choice for this patient.

male patients wear moustache or beard to cover the perioral area and it is mainly due to the presence of very thin lips.

The male lip reshape does not need to have the perfect "V" shaped Cupid's bow, full medial tubercle, and vermillion and ascendant line in the oral commissures as desired by women. But, at least, male lips should have a nice vermillion border and preferably a slight curved line in the upper lip seen on the profile view (Figs. 9.17a, b and 9.18a, b). The surroundings of the lips, labiomental and nasolabial lines, should also be taken into account and should be treated. Another important item to be evaluated is the dental arcade. Both the upper and lower arcades promote an important role in lip reshape, and so it is important to examine the male patient's teeth before starting the injection. An unfavorable dental arcade results in poor results. There are some male patients for whom lip treatment is very difficult, especially those who present excessive inversion of the vermillion during smile. Fillers may not produce the desired effect in this case. BoNT-A may be helpful by blocking the upper lip medial elevators, especially in patients with gummy smile.

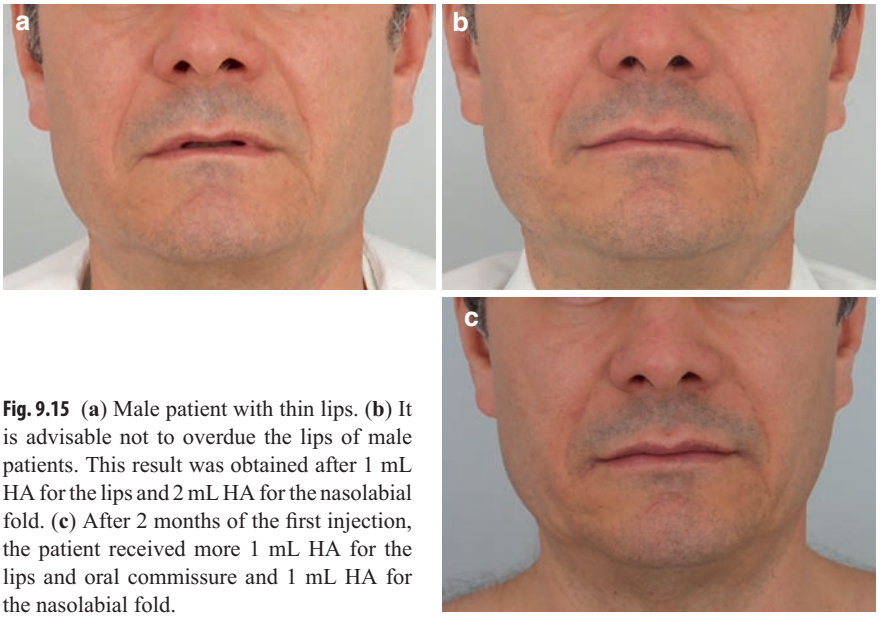

Fig. 9.15 (**a**) Male patient with thin lips. (**b**) It is advisable not to overdue the lips of male patients. This result was obtained after 1 mL HA for the lips and 2 mL HA for the nasolabial fold. (**c**) After 2 months of the first injection, the patient received more 1 mL HA for the lips and oral commissure and 1 mL HA for the nasolabial fold.

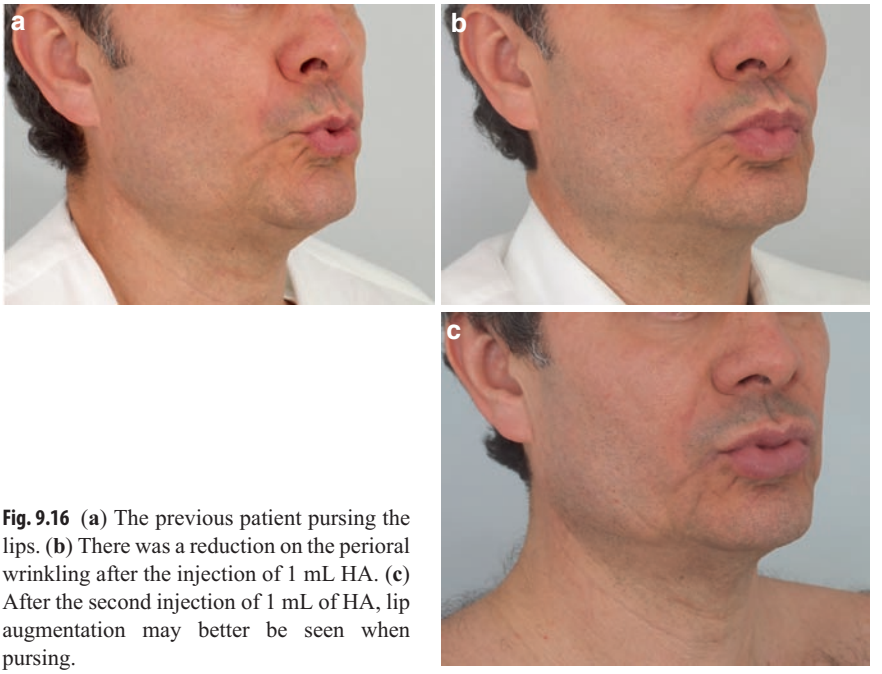

Fig. 9.16 (**a**) The previous patient pursing the lips. (**b**) There was a reduction on the perioral wrinkling after the injection of 1 mL HA. (**c**) After the second injection of 1 mL of HA, lip augmentation may better be seen when pursing.

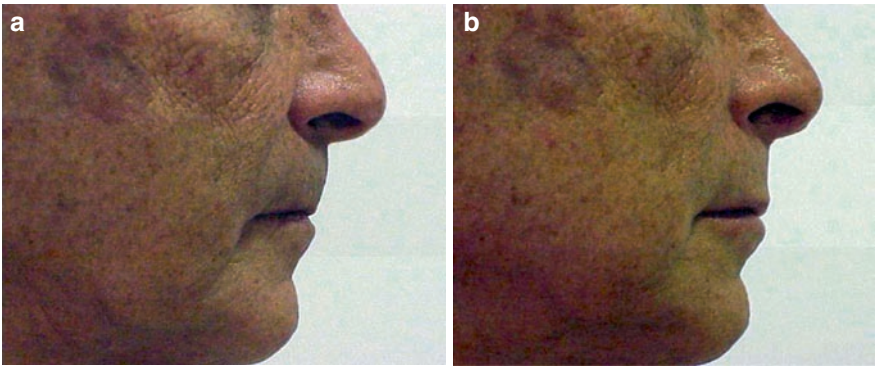

Fig. 9.17 (**a**) and (**b**) This 78-year-old patient had his lips with 1 mL HA injected. Note that the result is subtle. The line in the upper lip is slightly more curved and the medial turbercle more projected. He now has a more pleasant profile.

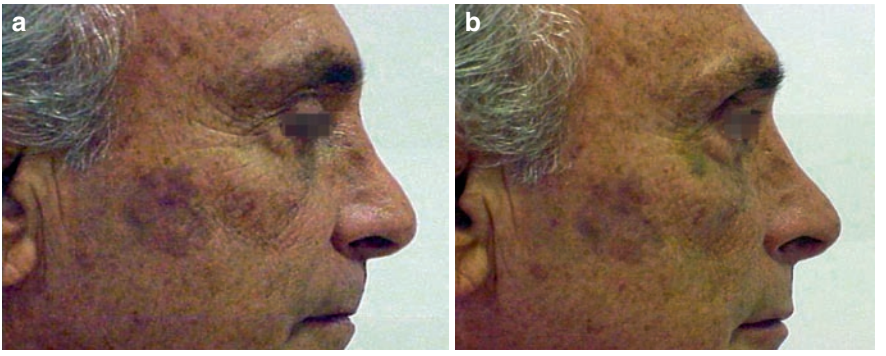

Fig. 9.18 (**a**) and (**b**) During the same procedure, the patient was also subjected to nose reshape with 1 mL HA injected into the nasal dorsum and into the nasolabial angle to lift the tip of the nose.

Filling the lips may be quite painful for patients, and so the best option for male patients is nerve blocking. For the upper lip, the infraorbital nerve must be injected followed by infiltration of lidocaine in the submucosa laterally and medially to the frenulum linguae. For the lower lip, the mentalis nerve should be blocked and infiltration into the submucosa is also beneficial. Biodegradable products, although temporary, promote the most natural results in male patients (Fig. 9.19a, b). However, very good results are obtained with the injection of nonbiodegradable products along the lip border in male patients as well. Care should be taken not to inject them too superficially; otherwise, lump formation may occur.

Retrograde injections are preferred, as serial technique increases bleeding and may lead to irregular filling. The frame of the lips (the white line) should be injected first. It will be helpful to limit the vermillion expansion both in the upper and the lower lip. The vermillion is then augmented, if needed (Figs. 9.20a, b and 9.21a, b). Swelling, ecchymosis, and redness are very common during this procedure. For male patients who may need more volume, a two-step treatment is advisable. Usually, male patients prefer to undertake lip treatments before the weekends, not to interfere with professional life.

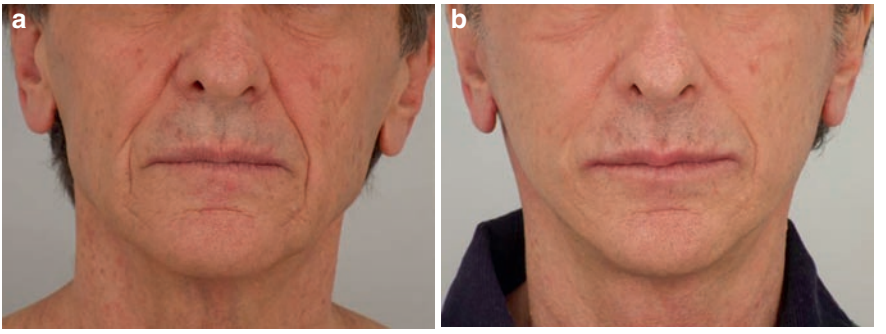

Fig. 9.19 (**a**) The perioral area of this patient was treated as a cosmetic unity. The nasolabial fold became less prominent with the use of nonbiodegradable product. The lips, however, were injected with HA. (**b**) Note that there is no evidence that the lips were injected, which is the target in male patients.

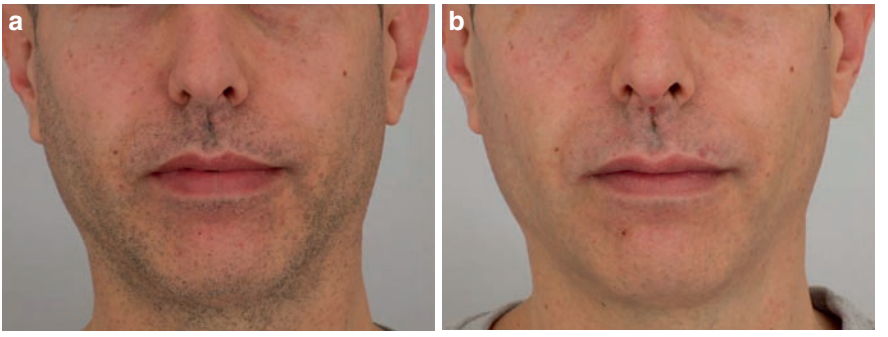

Fig. 9.20 (**a**) and (**b**) Before and 15 days after a very subtle upper lip augmentation with HA in this patient. Note that a better balance of the upper lip was obtained.

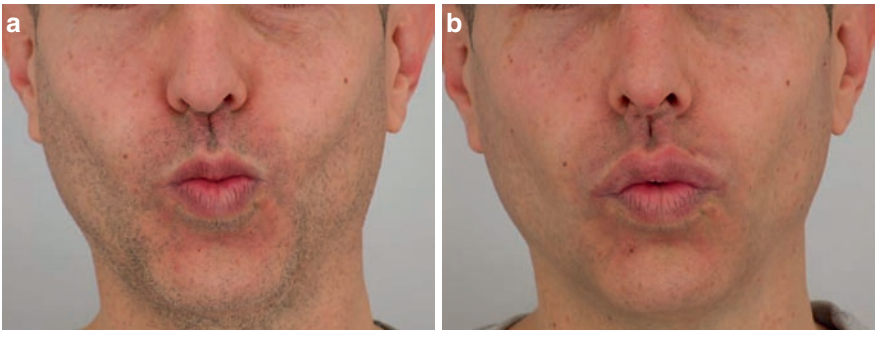

Fig. 9.21 (**a**) and (**b**) The same patient is now pursing before and 15 days after the procedure. On animation, the volume replacement can be better evidenced.

9.10.7 Marionette Lines

Marionette lines draw the corners of the mouth downwards, making the face appear to be sad. They are formed by the m. depressor anguli oris and the platysma as well as by the increased laxity of the SMAS in older patients. Topical anaesthesia or tiny skin infiltration at the oral commissure level is recommended. A triangular feathering injection is usually performed to elevate the whole area. For the deep and medium size lines, the retrograde tunnel technique or the multiple injection site technique can be used. Deep folds usually require multilevel injections.

Either biodegradable or nonbiodegradable products can be used at this level. Lump formation is less perceived in men than in women when the treatment of the oral comissure is undertaken, but it may also occasionally happen in men. For the treatment of the marionette lines in male patients, it is very common to use the single-use injectable fillers. For difficult cases, BoNT-A is normally associated previously to block the depressor anguli oris and the platysma to decrease the downward movement of the corner of the mouth.

9.10.8 Mandible and Chin Reshape

The chin is a symbol of masculinity for men and sensuality for women. Women must have more delicate chin, with less fullness concentrated at the central part. Men, on the other hand, may have heavier features and should have stronger chins. The use of silicone prostheses for chin augmentation has been decreasing due to the presence of long-lasting large polymers fillers. If given the option, male patients will undergo chin reshape with injectables rather than surgery.

When considering a patient for chin augmentation with fillers, evaluation of the occlusion, skeletal, and dental relationship must be performed. Male patients with normal occlusion are the best candidates and the ideal relationship of one-third upper lip and two-thirds lower lip and chin should be observed. If the candidate presents with good chin projection and no lateral fullness, fillers should be injected only laterally. Fillers may be injected into the central segment alone, between the mental foramina and along the mandible body to improve chin projection jawline reshape, respectively. Injection into the mandibular angle will either widen or elongate the posterior mandibular angle, promoting a strong posterior jawline contour, desired in male patients.

Topical anaesthetic or mentalis nerve block can be performed. Retrograde injection is usually applied in a multilayer fashion and volume required is usually very high but the result is amazing. The short duration is a drawback for the use of biodegradable fillers. That is why the use of nonbiodegradable products at the chin level has been increasing lately.

9.11 Adverse Reactions

Usually there are not many adverse reactions with the use of injectable fillers in male patients. But in case they happen, the first goal should always be to reduce immediately the visible impact of them. Acute infections require the use of proper antibiotics that may be better identified by bacterial culture. Bluish discolorations after the superficial injection of hyaluronic acid is not commonly seen in male patients and that will resolve either itself with time or may be corrected by the injection of hyaluronidase (see Chap. 12).

Several types of granulomatous reactions exist. All are treated with the injections of steroids. Initially patients are treated with triamcinolonacetonid, either 10 mg in 1 mL or 40 mg in 1 mL. Care should be taken not to induce severe atrophy in areas with underlying fatty tissue. Therefore, the steroid should be injected directly into the granuloma. The duration of therapy varies between patients. The aim of the treatment should be to make the granulomatous reaction less visible. If there is no response after approximately eight injections in 2 months, 5-Fluoruracil (50 mg mL^{-1}) can be added to the Triamcinolon (1 mg mL^{-1}). There are cases where surgical excisions are necessary but that may lead to some kind of scarring.

Lately, the use of lasers has been used to destroy the polymers and the granulomatous tissues surrounding nonbiodegradable products. Daniel Cassuto, an Italian plastic surgeon, was the pioneer in this technique and has been obtaining promising results.

Top 10 key pointers

- Fillers have become a very desirable component of the nonsurgical cosmetic armamentarium for men, chiefly as a device for the correction of defects associated with ageing face, as well as the correction of acne scars.
- The actual volume deposited with each injection site is minimal (from 0.1 to 0.3 mL) for the vast majority of devices. For male patients, however, it can be slightly higher to obtain the desired correction when compared with female patients.
- Although the vast majority of dermal filler injections are undertaken under insufficient topical or no anesthesia at all for women, it would be convenient to provide adequate analgesia for male patients. Never let the male patients feel pain during aesthetic procedures. Any negative experience may avoid male patients to continue with facial treatments. Anesthesia should be seen as one of the most important steps with fillers.
- The amount of filler needed should be realistically estimated for the nasolabial fold, and unfortunately it is underestimated in male patients and dissatisfaction usually results.
- Do not over-inject deep nasolabial folds with muscle hyperactivity with fillers. A “sausage-like” appearance may result.
- Treatment of the cheekbones with injectable fillers in male patients should be coadjuvant with the treatment of prominent nasolabial folds that are difficult to handle.
- Some of the results of the nose reshape with injectable fillers are comparable with surgery. It is absolutely a good option for male patients who are not willing or not suitable for surgical procedures.

- The inclusion of lidocaine into HA products will change the quantity of fillers injected into male patients, especially for those who will undergo lip reshape.
- If given the option, male patients will undergo chin reshape with injectable fillers rather than surgical procedure.
- It is interesting to replace volume into the mandibular angle. It promotes a strong posterior jawline contour desired in male patients.

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Combination Therapy

10

Maurício de Maio

10.1 Ageing Signs

As physicians became more sophisticated in their understanding of facial ageing, the search began for solutions that provided for the complexities that included surgical repositioning, chemodenervation, and volumetric restoration.

Aged face is the consequence of several concurrent factors, including skin laxity, soft tissue ptosis, and volume loss. As a general rule, improving the condition of the skin is commonly obtained with resurfacing procedures, laser and light therapy, daily skin care, and UV protection. Correction of soft tissue ptosis is surgically treated with a brow-lift, midface lift, and lower face rhytidectomy. Volume loss can be treated with injectable fillers or fat transfers, and finally, BoNT-A toxin can treat muscle over-contraction (Fig. 10.1).

Static rhytides are produced by endogenous and exogenous forces. Dermal atrophy due to chronological ageing and environmental influences such as gravity, sun exposure, sleeping pressure, and smoking determine the degree of wrinkle severity. Later, facial expression lines may be present even at rest. It is hypothesized that constant motion may cause the formation of subdermal fibrotic connections and muscular fascial contractions, thus producing static rhytides (Connor et al. 2003).

Today, there are many treatments to reduce the appearance of facial wrinkles and folds, including surface treatments (chemical peels and laser resurfacing), injections (BoNT-A and fillers), and face lifts (Monheit 2005). Patients seeking to re-establish their jaw lines may benefit from neck liposuction. Each of these techniques is effective in reducing the signs of facial ageing. However, these techniques, in isolation, have limitations and disadvantages, especially for the patient who wants to see an immediate improvement with minimal discomfort and time away from social and work engagements.

The techniques available to patients for reducing or eliminating the signs of facial ageing offer short- to longer-term correction. Patients considering these options need to be aware of the effectiveness, permanence, level of discomfort, and down time associated with each treatment.

Chemical peels, such as salicylic acid, trichloroacetic acid, glycolic acid, carbon dioxide, lactic acid, tartaric acid, malic acid, or phenol, work best for superficial to moderate static wrinkles. The technique produces a controlled partial thickness injury to the surface of the skin, with subsequent wound healing. The skin regenerates, and the result is a reduced

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Fig. 10.1 This patient presents skin atrophy and a decrease of facial fat content that could be improved by volume replacement. The presence of solar lentigines on the cheek area may be treated either by chemical peels or by light systems or both. Static and dynamic wrinkles in the periorbital area are usually handled by BoNT-A alone in male patients.

appearance of wrinkles. Immediately after the procedure, the patient may experience some discomfort (pain and itching) (Monheit 2004). Cutaneous laser resurfacing uses short-pulsed high energy or scanned carbon dioxide lasers to treat superficial-to-moderate static wrinkles by removing layers of photodamaged skin in a precise fashion. The result is skin regeneration and a reduced appearance of wrinkles. Immediately after the procedure, the patient may experience some discomfort. The patient's face may be reddened and swollen, and semiocclusive dressings may be necessary. Patients treated with this technique may experience erythema, scarring, hypopigmentation, swelling, and itching and are at risk for infection. The visible signs of each of these treatments may cause the patient to avoid social or work activities for a short time while healing takes place.

Injectable fillers (bovine and tissue-engineered collagen, hyaluronic acid, and others) are used to replace soft tissue volume for moderate-to-deeper static wrinkles (Eppley and Dadcand 2006). When compared with peels and laser resurfacing, they do not injure the surface of the skin. The results of the procedure are immediately apparent as a reduction in the appearance of wrinkles and volume replacement. The few complications associated with injectable fillers are rare and include infection, nodule formation (usually a sign of a foreign body reaction), and allergic responses. Correction with most injectable fillers is not permanent. For the absorbable ones, the patient must return for injections generally after 3–6 months.

BoNT-A is used to treat dynamic wrinkles (facial lines and wrinkles caused by hyper-functional muscles). When compared with fillers, the patients notice a clinical effect 1–3 days after injection and the effect is maximal after 1–2 weeks. The few complications include brow ptosis, minimal ecchymosis, and bruising. Like fillers, the results are not permanent, and patients must return for injections every 3–6 months.

To improve sagging skin or skin laxity, surgeons offer patients with facelifts or mini facelifts, which involve subcutaneous dissection and excision of redundant skin. Several techniques are available that include only the skin and techniques that involve modification

of the superficial musculoaponeurotic system (SMAS) (Matarasso et al. 2000). Facelift surgeries are generally performed under general anesthesia. Initially, they may experience swelling, bruising, and discomfort, and so dressings and drains may be necessary. The complications of this procedure can include asymmetry, abnormal contour, altered expression, hematoma, nerve injuries, infection, skin flap necrosis, hypertrophic scarring, and alopecia. The visible signs of having surgery may cause the patient to avoid social or work activities for a short time while healing takes place.

10.2 BoNT-A and Fillers

The combination of BoNT-A and fillers is a highly synergistic approach to achieve more effective and longer lasting results for both methods. This combination is adequate for the treatment of associated rhytides. BoNT-A eliminates or reduces the muscular activity responsible for the dynamic component of the wrinkle, while fillers are used to treat the static component. Putting them together, the longevity of the filling agent is increased (Fagien and Brandt 2001). As a general rule, historically, BoNT-A has been primarily used for the treatment in the upper third of the face, while dermal fillers are used to improve the lower third (Fig. 10.2a, b). But above all, male patients benefit from their combination for overall facial improvement (Fig. 10.3a, b).

Fig. 10.2 (**a**) This patient required a nonsurgical facial procedure to overall improvement of the face. (**b**) After the treatment of BoNT-A in the upper and fillers in the mid and lower thirds of the face, a nicer and natural look was obtained. This is the typical combination therapy that most male patients undertake.

Fig. 10.3 (**a**) Patient with masseter hypertrophy mainly on his left. (**b**) A much pleasant facial aspect was obtained after 3 months of BoNT-A therapy of the masseter and the injection of a biodegradable fillers into the nasolabial fold and upper lip.

Associated rhytides result from muscle hyperactivity and soft-tissue reduction at a specific site. Both aspects are synergists and may produce or worsen the skin wrinkling. Muscle hyperactivity leads to constant pressure on soft-tissues, and the lack of mechanical barrier weakens and deepens the dermis forming the wrinkles. The dermis and the subcutaneous layer are important mechanical foundations that avoid the formation of wrinkles in dynamic areas. Because of ageing process, there is a constant decrease in dermal thickness and subcutaneous fat, and the mechanical barrier weakens and the depth of the wrinkle increases. Muscle movements are limited by mechanical barriers, and as a result, muscle contraction deforms even more the skin surface by deepening the rhytides. Facial regions that more obviously benefit from combination treatment are those areas that have transitioned from dynamic to static lines, furrows, and depressions. Glabella lines that are present at rest and worsened at animation are good examples for the need of combining therapies. Another area that may require combination therapy is the "downturned" corner of the mouth. Volume loss and the over contraction of the m. depressor anguli oris are, respectively, treated with dermal fillers and BoNT-A, which leads to longer lasting effects of both therapies.

Male skin is usually thicker than female skin and the number of wrinkles and the extension of the wrinkles also differ. The wrinkling pattern is different, and as a rule, women present a greater number of thin wrinkles while men usually present thicker and less numerous wrinkles.

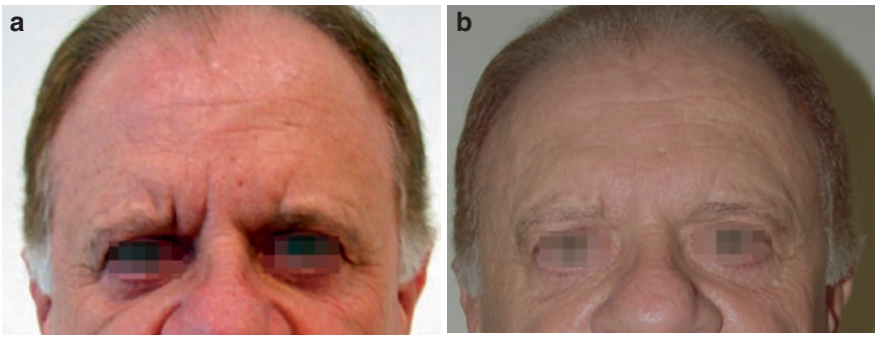

Fig. 10.4 (**a**) This patient is at rest and presents a hypertonic pattern of the muscles at the glabella area. The single use of BoNT-A is not sufficient. (**b**) Result after combined treatment of BoNT-A and injection of fillers into the deeper wrinkles after 15 days. The use of blunt cannula at this level is safer than if injected with a sharp needle.

10.2.1 Glabella Lines

Either from increasing photodamage or from constant muscle hyperactivity in the glabella area, there may appear resting vertical or horizontal rhytides at this level. Male patients are very good candidates for combination therapy at the glabella (Fig. 10.4a, b).

The single use of BoNT-A is usually not enough in older patients. Both treatments may be undertaken in the same session due to the fact that the products are injected in different layers. It is not uncommon though, BoNT-A can be injected previously about 15 days before the filler procedure. The advantages of pretreating the patient with BoNT-A include less quantity of filler to be injected, as BoNT-A already softens the lines; the opportunity to reinject BoNT-A in case there is still excessive contraction or any asymmetries improve the relationship with male patient and the cosmetic practitioner. The use of less quantity of fillers at this level is advisable because it decreases the risk of any intrinsic or extrinsic vascular impairment, and edema at the upper eyelid due to the low position of the medial aspect of the male eyebrow. The disadvantage seen by male patients is that they must go back for another shot and usually they have prepared themselves to do it in the same session.

10.2.2 Horizontal Forehead Lines and Brow Ptosis

Brow ptosis is a common feature seen in male patients not only during the ageing process. Interestingly, mild brow ptosis in male patient gives an impression of leadership and power. In severe cases, it is seen primarily as a sign of anger (Coleman and Carruthers 2006).

In general, genetically speaking, male eyebrows are lower both in the medial, intermediate, and lateral aspects when compared with that of women. In severe cases, it can result in an inadvertent hostile negative impression. BoNT-A injected into the intra eyebrow hair

Fig. 10.5 (**a**) Male patient presenting hyperkinetic lines in the forehead and a prominent nasolabial fold. (**b**) He was subjected to the injection of BoNT-A in the upper third, which promoted elevation of the lateral aspect of the eyebrow. The nasolabial fold was injected with high density HA.

produces a very effective brow lifting due to the blocking of all eyebrow depressors and the frontalis lower fibres. The frontalis lifting fibres will then work more efficiently as there is less antagonist force. Fillers may be injected after 15 days all along the eyebrow or only into the upper lateral aspect of the orbit in older male patients who have flatness at this level. That results in a youthful anterior projection to the lateral brow contour. With less brow movement, there is less possibility of migration of the injectable filler down to the upper eyelid.

Horizontal forehead lines usually appear earlier in male patients than in females. Men tend to compensate the low brow position and upper eyelid skin excess with frontalis contraction (Fig. 10.5a, b). Asymmetrical eyebrow position leads easily to asymmetrical forehead lines. Most men are not too distressed until the forehead lines become relatively deep. These horizontal lines are seen as a distinctively masculinizing feature. So, care should be taken while addressing these lines to avoid a feminine look. Another aspect to observe is the excessive weakening of the frontalis with BoNT-A, which could lead to brow ptosis. With proper technique, BoNT-A usually suffices for the treatment of forehead horizontal lines in male patients. Fillers may be injected into very deep lines or scars in selected cases and by experienced injectors. In atrophic forehead skin, residual beads of fillers may be evident in the superficial dermis along the horizontal lines.

10.2.3 Tear-Trough and Crow's Feet

Men have bigger supraorbital ridges and more deeply set eyes when compared to women. The tear-trough becomes deeper due to loss of facial volume, the descent of the globe,

and the malar fat pad. The skin darkening may increase because of the shadowing of the medial orbital fat pad. The skeletonized appearance of the orbital margin may be naturally present in very thin or older individuals, or may result from excessive orbital fat pad removal after lower eyelid surgery. Another feature should also be analyzed while evaluating the lower eyelid area. In some patients, the tear-trough may be relatively deeper due to muscular projection at the subciliary region. This is called hypertrophy of the orbicularis oculi pars palpebralis. In patients with a normal snap test (pull the lower eyelid downward and assess how long it takes to return to a normal position, a return of less than 1 s – without blinking – is normal), the lower lid contour may be further improved by injecting BoNT-A in the mid-pupillary line 2–3 mm below the inferior ciliary margin. The tear-trough should be filled and a very nice aspect at the periorbital level results in male patients.

The crow's feet are considered a tricky area to fill, especially in female patients. However, for male patients, the combination of BoNT-A and fillers is very effective. Because of the thickness of male skin, injectable fillers are adequate at this level and the result is subtle, with no evidence of papules or nodules

10.2.4 Cheek Bones

The male maxilla, muscles of mastication, and mandible are sturdier than those in a woman of similar age. Very projected cheekbones are considered a feminine sign. A young adult woman has a more heart-shaped face than a young man. So, when addressing cheekbones in man, care should be taken not to overdo them. A mild volumetric replacement with fillers may be helpful for the treatment of skeletonized face. Besides that, BoNT-A may be injected in the same session into the deep elongated crow's feet that reach the cheek area. Combining fillers with BoNT-A at this level is a good solution for the treatment of those lines that are quite difficult to be addressed with either method alone.

10.2.5 Nasolabial Fold

A deep nasolabial fold results from different reasons that include muscle hyperactivity, excess skin over the nasolabial fold, dermal atrophy, retrograde position of upper dental arcade, and a combination of more than one etiology. Although fillers are the number one indication for the correction of a prominent nasolabial fold, it must be verified if there is hypertonicity of the levator labii superioris alaeque nasi and the levator labii superioris that influences the depth of the nasolabial fold. The blocking of these muscles softens the nasolabial groove, and injectors sometimes forget that volume replacement only lead to a "sausage-like" appearance of the fold, without effectively correcting it. When both components are involved, the dynamic one should be handled first, and injectable fillers are performed after 15 days. Both treatments may be undertaken in the same session. Lower filler volume is advisable.

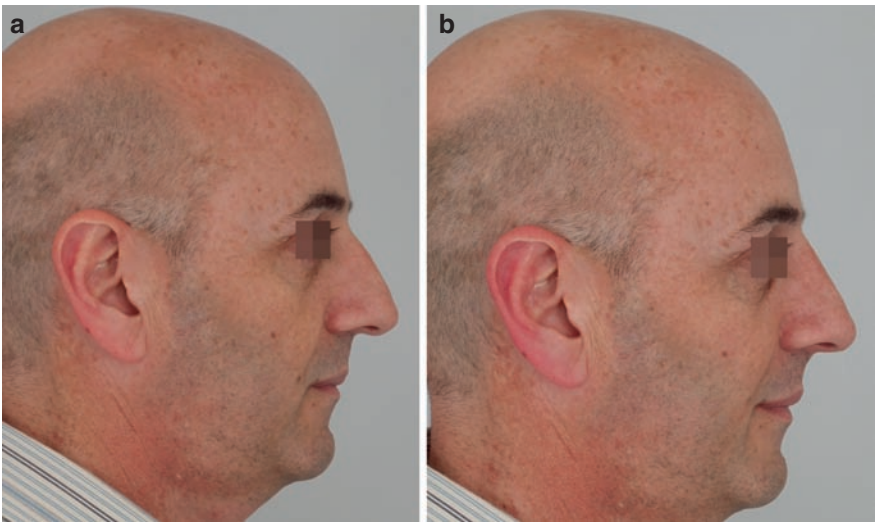

Fig. 10.6 (**a**) and (**b**) Static analysis of the before and immediate after the injection of BoNT-A into the depressor septi nasi and 1 mL HA into the frontonasal angle and into the nasolabial angle. No evidence of the nose reshape can be seen.

10.2.6 Nose

Male nose is an area that is often neglected by both patients and injectors. A very acute nasolabial angle and excessive droop of the tip of the nose while smiling is not a positive cosmetic sign even in male patients. The combination of BoNT-A into the depressor of the septum and fillers injected into the nasolabial angle and on the nasal dorsum (if needed) provides a very rejuvenating look for the male face (Fig. 10.6a, b and 10.7a, b). Ideally, BoNT-A should be injected first to enable the visualization of the real effect that the muscle blocking has achieved, and second, to avoid retention of the BoNT-A solution into the injectable if a hydrophilic product, such as hyaluronic acid, is to be used. If both products are to be used in the same session at the nasolabial angle, the injectable filler should be injected first and deeper to the anterior nasal spine, while BoNT-A should be injected more superficially and a little bit higher in the middle of the collumella.

10.2.7 Perioral

The perioral region is very important to improve the overall cosmetic appearance of the lower face. It is somehow neglected in men for they believe that they should not be subjected to any procedure in the lips (Fig. 10.8a, b). The perioral aesthetic unit comprises the

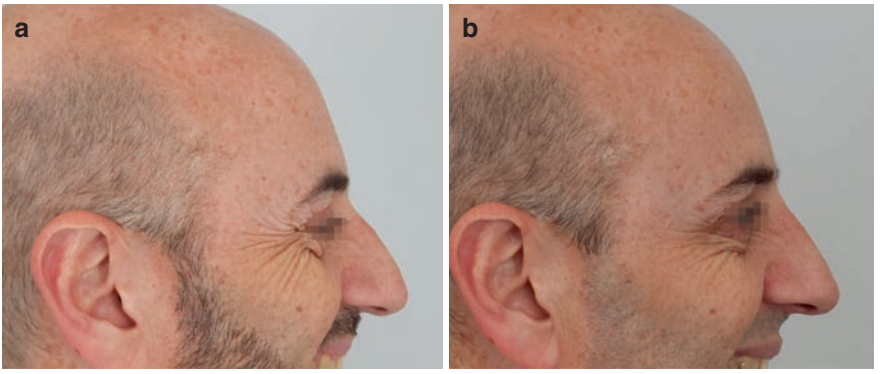

Fig. 10.7 (**a**) On animation, crow's feet and droop of the nasal tip may be observed. (**b**) The crow's feet were treated with BoNT-A. Only partial reduction on the periorbital wrinkles is advisable in male patients. The nose was treated with the combination of BoNT-A into the depressor septi nasi and 1 mL HA into the frontonasal angle and into the nasolabial angle.

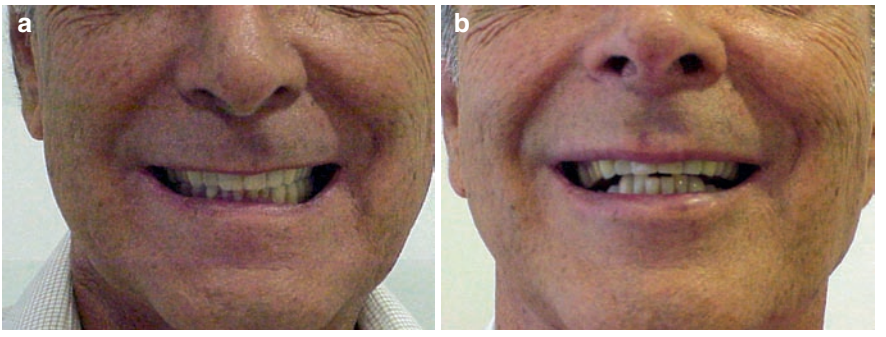

Fig. 10.8 (**a**) and (**b**) This 78-year-old male patient was subjected to the injection of BoNT-A into the depressor septi nasi and into the depressor labii inferioris at right. Injectable fillers were injected into the nasolabial angle to maintain the tip in the lifted position and into the upper and lower lips to improve the vermillion volume.

upper and lower lip, the philtrum, the melomental folds (the oblique lines that extend from the lateral oral comissures to the edge of the mandible), and the chin. Lip contouring with fillers help to restructure the lip units and reinforce the landmarks. Mild lip augmentation usually suffices for male patients. The association of fillers with BoNT-A is also beneficial at this level (Fig. 10.9a, b). BoNT-A can be injected into the depressor anguli oris and to mentalis to lift the corner of the mouth and to soften the horizontal line between the chin and the lower lip (Fig. 10.10a, b). Soft tissue augmentation to buttress the mouth corners is an important synergist to BoNT-A.

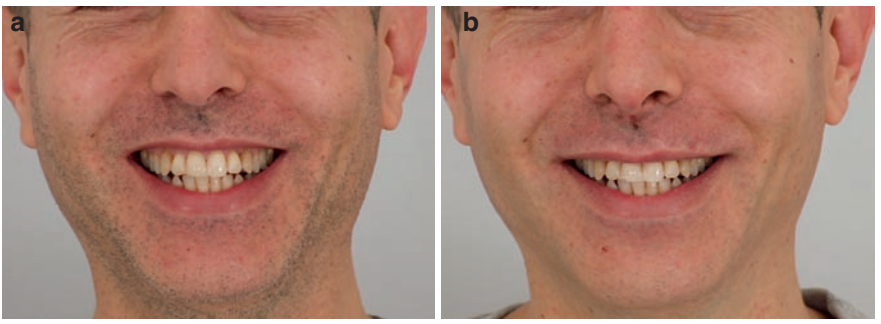

Fig. 10.9 (**a**) Pre-treatment: While smiling, this patient presents a mild gummy smile and slight asymmetry on his right side. (**b**) The patient was subjected to injection of BoNT-A into the levator labii superioris on the right side and upper lip contouring with HA on the same session. Mild nasal tip lifting was also obtained with HA. This photo was taken 15 days after the procedure.

Fig. 10.10 (**a**) Before the treatment, this patient presented dynamic lines on the zygomatic and on the lateral cheek areas. Note that there is also a hypertonic lateral platysmal band. (**b**) One of the drawbacks of the simultaneous treatment of the upper lip with BoNT-A and an injectable fillers is the temporary elongation of the upper lip. BoNT-A was also injected into cheek lines, DAO, and platysmal lateral band.

Key pointers

- Stronger muscles and deeper furrows will require higher BoNT-A doses or more volume when they are used alone. Male patients do not need full correction, and so combining these two therapies will lead to less dermal fillers volume and lower BoNT-A doses. That makes the male look natural.
- BoNT-A reduces repetitive activity that underlies the formation of rhytides, adjunctive treatment before dermal fillers extend the duration of effect and prevents the reformation of wrinkles.
- Injecting BoNT-A at the crow's feet and into the lower eyelid produce a slight relaxation in the muscle and may improve the tear-trough. The use of injectable fillers at this level will require less product and lower risk of adverse events.

FAQs

Which one should be injected first BoNT-A or fillers when we are treating the same area? And what is the period between the injections?
The dynamic component of the wrinkle should be treated first with BoNT-A and after 1 week the static component with fillers.

Is it possible to inject BoNT-A and fillers in the same area and in the same session?
Yes, however, one must be sure that the layer of injection is different, especially when HA or any other hydrophilic product is used.

10.3 BoNT-A and Resurfacing

The combination of laser resurfacing and BoNT-A improves moderate to severe photodamage and dynamic wrinkling. The muscle blocking enables a better healing of the newly resurfaced skin (Carruthers and Carruthers 2001). It is also theorized that mimetic muscles with BoNT-A presents less deformation on the skin and thus have less influence on the deposition and organization of collagen and elastic fibres, allowing the remodeled dermis to heal with a smoother surface topography (Vartanian and Dayan 2004). Clinical studies showed that if the forehead, glabella, and mainly crow's feet were treated previously with BoNT-A before the laser resurfacing, the result was superior to that when treated only with the laser (West and Alster 1999). Even more important is that the duration of result of the laser resurfacing is longer if BoNT-A injections are given every 6–12 months (Carruthers and Carruthers 2000). It is advisable to inject BoNT-A 1 week before the procedure, allowing the muscle blocking to be effective at the time of resurfacing. BoNT-A plays an important role with resurfacing methods. If there is no excessive muscle movement, collagen remodeling will proceed in a smoother fashion and decrease the risk of hypertrophic scarring. The absence of excessive muscle contraction also avoids rewrinkling. The use of BoNT-A prior to laser resurfacing is even more helpful during the healing phase after CO_2 treatments. As the injury is normally deeper, the healing process is generally more profuse. However, as mentioned in Chap. 7, CO_2 lasers are not very popular among male patients. If it is not advisable to inject BoNT-A immediately prior to CO_2 laser treatment due to temperature increase, the same rule is not formally applied for Er:YAG lasers. Owing to the fact that thermal damage is minimal and so is the necessity of aggressive rubbing to remove debris, BoNT-A may be safely injected immediately prior to Er:YAG resurfacing (Table 10.1). Another advantage to select Er:YAG systems to combine with BoNT-A is the absence of intense edematous postoperative phase, which means that very soon can BoNT-A be injected after laser resurfacing. Usually around the second or third postoperative day, it may take up to 15 days for edema to subsides after CO_2 laser treatments (Fig. 10.11a, b and 10.12a, b). For those male patients who need both laser resurfacing, BoNT-A injection, and quick recovery time, the association of Er:YAG laser and BoNT-A is preferable.

Table 10.1 Possibilities of association of either CO_2 or Er: YAG laser with BoNT-A

	Preferable	Possible	Avoid	Motive
BoNT-A 15 days prior to CO_2 laser or Er:YAG laser	X			The muscle blocking will be very effective or there is still time for complementary dose
BoNT-A 1 week prior to CO_2 laser or to Er:YAG laser		X		The muscle blocking will have reached almost its full final effect and rewrinkling will be avoided
BoNT-A 1 day prior to CO_2 laser or to Er:YAG laser		X		Wound healing initial phases will not benefit from movement absence but rewrinkling will be avoided in the first months
BoNT-A immediately prior to CO_2 laser			X	Thermal spread to deeper tissues may inactivate partially or totally the effect and aggressive removal of debris may lead to undesirable migration to untargeted muscles
BoNT-A immediately prior to Er: YAG laser		X		The lack of intense thermal increase and debris removal enable the application of both treatments in the same session
BoNT-A immediately after CO_2 laser			X	Intense edema may interfere with BoNT-A injection precision
BoNT-A immediately after Er:YAG laser		X		As long as the edema is not intense
BoNT-A 1 week after CO_2 laser			X	Intense edema may interfere with BoNT-A injection precision
BoNT-A 1 week after to Er:YAG laser		X		Skin is already reepithelized and edema has already subsided
BoNT-A 15 days after CO_2 laser or Er: YAG laser		X		Skin conditions already enable proper effect of BoNT-A if edema has completely subsided after CO_2 laser

Key pointers

- Male mimetic muscles are strong enough to produce wrinkling in the healing phase after ablative lasers, and so blocking the upper third before with BoNT-A not only improve the overall result and but also speed up the wound healing.
- BoNT-A should be reinjected as soon as important wrinkling start during the erythematous phase after resurfacing in male patients.

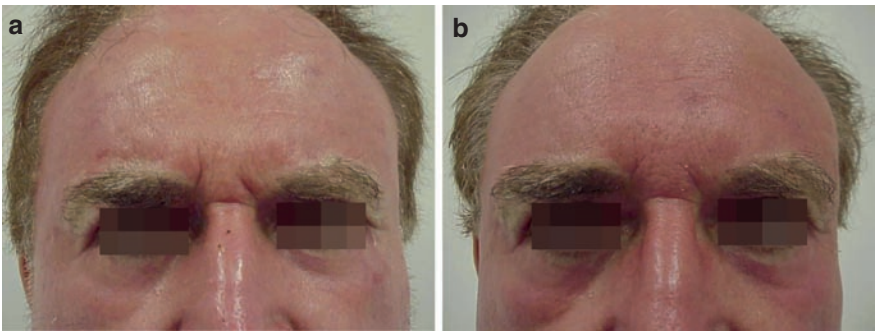

Fig. 10.11 (**a**) Patient after CO_2 laser resurfacing with dynamic wrinkling at the glabella level. (**b**) After 15 days of BoNT-A injection at this level, the patient had a decrease of muscle contraction but still persists with the wrinkling. An extra dose is still necessary, but the use of biodegradable fillers may be helpful. It is important to wait until the erythematous phase has subsided.

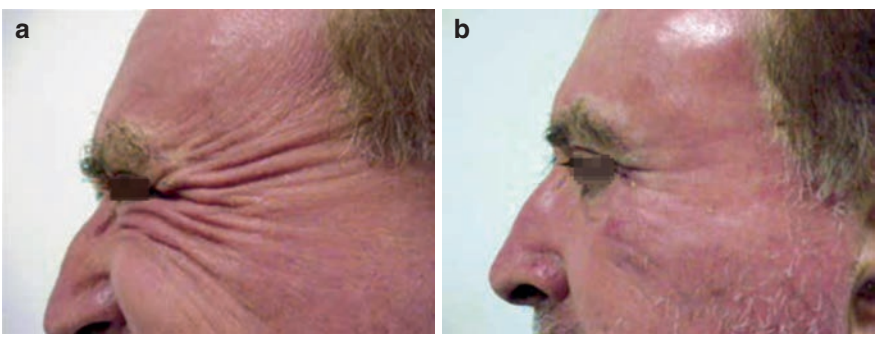

Fig. 10.12 (**a**) Male patient subjected to fullface CO_2 laser resurfacing. Note that dynamic wrinkling still persists, so the combination therapy with BoNT-A is necessary. It would have been interesting to have injected the patient previously to laser resurfacing. (**b**) The patient was treated still during the erythematous phase and a drastic improvement on the crow's feet was obtained.

- In case that BoNT-A was injected previously to laser resurfacing and the male patient still needs a retouch to improve results, reinjection can be undertaken after the edematous phase has subsided.
- In case BoNT-A should be injected immediately prior to any laser resurfacing, select an Er:YAG system and adverse events will be minimized.
- The adjunctive use of BoNT-A with ablative laser resurfacing leads to superior and longer lasting outcomes with regular injection once or twice a year.

FAQs

Can BoNT-A be injected immediately before the resurfacing procedure?
It is not advisable because the skin heat may alter the BoNT-A molecule and decrease its performance. Another issue is the rubbing of the skin with gauze to remove the epidermis that may interfere with migration.

Can BoNT-A be injected immediately after the resurfacing procedure?
Yes, but the edema may make the precision more difficult for the injector. The injection should be deep into the muscle to guarantee the effect. It is better to inject when edema subsides.

10.4 BoNT-A and Sub-Ablative Systems

When BoNT-A is associated with sub-ablative IPL systems, both treatments work synergistically to improve wrinkles, especially at the crow's feet area (Table 10.2). Moreover, there is also a slightly improved response of lentigines, telangiectasia, pore size, and skin

Table 10.2 Possibilities of association of sub-ablative treatments with BoNT-A

	Preferable	Possible	Avoid	Motive
BoNT-A 15 days prior to Nonablative treatments	X			Male patients will feel enthusiastic about the result and will be more confident to further cosmetic treatments
BoNT-A 1 week prior nonablative treatments		X		Although there is usually no proper time for retouches, male patients feel encouraged to undergo further cosmetic treatments
BoNT-A 1 day prior to nonablative treatments		X		Male patients tend to refuse to accept this possibility
BoNT-A immediately prior to nonablative treatments			X	Thermal spread to deeper tissues may partially or totally inactivate the BoNT-A molecule effect
BoNT-A immediately after to nonablative treatments	X			That is the most common timing for association of both treatments
BoNT-A 1 week or 15 days after nonablative treatments		X		It is another option when male patients become too sensitive and refuse to undergo immediate BoNT-A injection after nonablative treatments

Fig. 10.13 (**a**) and (**b**) Before and after a patient who was subjected for one session of nonablative resurfacing, BoNT-A in the upper third, and 1 mL HA both sides into the nasolabial fold. There was an overall improvement of the global aspect of the face.

texture when compared with IPL alone (Carruthers and Carruthers 2004). BoNT-A and sub-ablative resurfacing may be easily undertaken in the same session. If both procedures are to be done in the same session, the nonablative treatment should be carried out first and then the injection of BoNT-A should follow. Usually topical anaesthetic or ice is applied before both procedures to reduce any discomfort for the patient. It is a very useful treatment for male patients who cannot have any downtime and need dynamic wrinkle removal and photorejuvenation (Fig. 10.13a, b). It is also possible to use fractional lasers and BoNT-A on the same day (Narurkar 2007). As fractional lasers produce some discomfort during application, some male patients need to be stimulated to continue with the treatment with BoNT-A soon after the procedure.

Do's

- Do start with BoNT-A and then indicate nonablative treatments. Male patients tend to accept them more enthusiastically.

Don'ts

- Do not inject BoNT-A prior to nonablative treatments on the same session.

Key pointers

- The association of nonablative systems with BoNT-A is one of the most common treatments for male patients on a regular basis.

FAQs

What is the advantage of combining BoNT-A with nonablative treatments for male patients?
Both are minimal invasive procedures that require no downtime. Both together promote cosmetic improvement for the male face. While BoNT-A reduces unwanted dynamic wrinkling, nonablative systems improve skin texture, lentigines, telangiectasias, and other hyperpigmented spots.

10.5 BoNT-A and Chemical Peeling

Chemical peels are one of the most powerful rejuvenating procedures. To choose correctly the depth of the peeling procedure, it is important to define the depth of the lesion or the wrinkle that should be erased. Superficial peels are suitable for corneal layer and upper epidermal defects. Medium-depth peels are usually enough to treat pigmentary changes. Static wrinkles generally reach the mid-reticular dermis, for which deep peels should be indicated.

Superficial and BoNT-A can be applied in the same session. If the male patient is subjected for a glycolic acid peel that needs to be neutralized with tap water, BoNT-A is better injected soon after the peeling procedure is finished. BoNT-A may also be injected after a midpeel, with no risk of diffusing to nontargeted muscles. As to deep peels, it is advisable to inject BoNT-A prior to the peeling procedure. The best timing is about 2 weeks before as the immobilized skin can regenerate more efficiently and collagen remodeling becomes more effective. Should BoNT-A be injected after a deep peel, it is advisable to wait for 3 weeks as the extensive inflammatory phase may interfere with BoNT-A dispersion (Landau 2006).

The reason why chemical peels and BoNT-A should be associated for male patients is clear (Table 10.3). BoNT-A focus on undesirable muscle movement while chemical peels work on skin quality.

Do's

- Do combine BoNT-A with light superficial chemical peels when skin conditioning and excessive mimetic wrinkling are to be treated.
- Do combine BoNT-A with superficial chemical peels when wrinkles and superficial hyperpigmented spots such as freckles are to be treated.

Don'ts

- Do not forget that BoNT-A may be injected soon after midpeels with no risk of diffusion to nontarget muscles.

Table 10.3 Possibilities of association of peels with BoNT-A

Combination	Superficial peels	Midpeels	Deep peels	Comment
BoNT-A injected 15 days before the chemical peel	Preferable due to enough time for retouches	Preferable due to absence of mimetic muscle movements and less interference with crusts	Preferable as the immobilized skin can regenerate more efficiently and collagen remodelling becomes more effective	From a rational point of view, BoNT-A injected 15 days before the chemical peel is helpful both for improving BoNT-A results and healing process
BoNT-A injected 1 week before the chemical peel	Possible	Possible	Possible	It is not unusual that when a male patient starts seeing the BoNT-A result, he becomes enthusiastic and decides to "finally" be subjected to the chemical peel previously indicated
BoNT-A injected 1 day before the chemical peel	Possible	Possible	Possible	Although it is possible, it is usually not a choice made by male patients unless they are supposed to have a medical visit one day prior to the procedure for any other reason. Some male patients may accept this option if they have professional commitments that would make a chemical peel treatment too evident but decide to undergo on the following day
Chemical Peels and BoNT-A on the same day	With exception to glycolic acid that require neutralization with tap water and probable head bending, all other peels can be applied after BoNT-A	If rubbing gauze is to be used as an applicator, BoNT-A should be injected after the chemical peel treatment. If sable brushes are to be used instead, BoNT-A may be injected prior or immediately after the chemical peel	The intense edema may interfere with BoNT-A effectiveness. It is not advisable to perform both treatments on the same session	It is usually the most practical timing for association of chemical peels and BoNT-A for male patients

(continued)

Table 10.3 (continued)

Combination	Superficial peels	Midpeels	Deep peels	Comment
BoNT-A injected 1 day after the chemical peel	Possible	Possible if the skin is not too sensitive	Avoid due to intense edema and possibility of lack of injection precision	Some male patients booked for both procedures on the same day and refuse to undergo the chemical peel usually due to discomfort but they still need a very quick result of both treatments
BoNT-A injected 1 week after the chemical peel	Possible	Possible even in the presence of crusts	Avoid due to profuse healing process	It is common especially after superficial chemical peels. Male patients feel stimulated by the new aspect of the skin and may decide to go further other cosmetic procedures
BoNT-A injected 15 days after the chemical peel	Possible	Possible	Possible	The new aspect of the skin really stimulates male patients to undergo BoNT-A, especially after either superficial or midpeels. However, they consider it too soon after a deep peel. They still may feel "traumatized"

- Do not forget to inject BoNT-A prior to deep peels or 3 weeks after when extensive inflammation has subsided.

Key pointers

- BoNT-A and light peels are the perfect combination for male patients who need a quick facial refreshment without any downtime.

FAQs

What is the most common association of BoNT-A and chemical peels for male patients?
The most common association is a serial number of glycolic acid peels for skin conditioning and the use of BoNT-A for glabella and forehead lines and crow's feet.

10.6 Fillers

It is very common nowadays to inject a patient who has been injected previously with fillers into the nasolabial fold, for example. The vast amount of different fillers found in the market and the enormous number of injectors makes it even more possible. The problem is that the patient himself has absolutely no idea of what type of material he has been injected with previously. And then comes the difficult decision: should I inject or not this patient? Before making the decision, it is important to evaluate the advantages and disadvantages of reinjecting that patient. If only could we know if it was a biodegradable or nonbiodegradable product, the decision would be far easier. Biodegradable products are mainly derived from hyaluronic acid and to a lesser extent from collagen. Nonbiodegradable products include mainly silicone, polymethylmethacrylate, and polyacrilamide among others. As a general rule, biodegradable products are injected into intradermal level and nonbiodegradable products are injected into subdermal or into the subcutaneous layer. If the patient presented no early or late complications at the treated site and a period after 1 year, it is unlikely that a new injection into the same area will provoke any further complication. To select the product is a question of correct diagnosis if the problem is dermal or subdermal/subcutaneous layer. The Table 10.4 provides tips and tricks for knowing whether a biodegradable or nonbiodegradable was previously injected.

Do's

- Do treat male patient who asks to be injected by you if the area presents no problems from previous injectables.

Don'ts

- Do not treat any male patient who presents any complications from previous injectables without proper evaluation and treatment.

Table 10.4 Tips and tricks for evaluating what type of filler was previously injected into the male patient

	Biodegradable	Non-biodegrabable
The previous injector told the patient that it was a fold easy to correct and the result was very good after the injection	Very likely	Possible
The patient referred that his fold was very deep and the correction was poor after the treatment	Very likely	Unlikely
The fold was not deep and only one syringe was used	Possible	Possible
The fold was very deep and the patient was told that only one syringe would suffice for the treatment.	Very unlikely	Very likely
The injector informed that the correction would last about one year	Very likely	Very unlikely
The injector informed the correction would last more than 3 years	Very unlikely	Very likely
More than two syringes was injected in the same session	Very likely	Possible but unlikely
Edema was intense after the procedure	Likely	Possible
Presence of nodules in the first week	Likely	Very likely
Presence of nodules after the first week	Unlikely	Very likely
Presence of permanent nodules	Unlikely	Very likely
Presence of intermittent edema years after the injection	Unlikely	Very likely
The duration of result was very short	Very likely	Unlikely

Key pointers

- There is no problem to treat an area with biodegradable products that was previously injected with nonbiodegradable products and vice and versa.
- There is no problem to treat an area with biodegradable products that was previously injected with biodegradable products.
- There is no problem to treat an area with nonbiodegradable products that was previously injected with nonbiodegradable products.
- It is possible to treat patients in the same area with HA or collagen that were previously treated by PMMA, and conversely PMMA can be administered in areas previously treated with other fillers.

FAQs

What should you ask for your patient about previous fillers injected in the same area that you are planning to treat?

The questions should include the depth of crease or fold; the level of correction obtained; if a retouch was necessary and when; if edema was important after the treatment and in the following days; if nodules could be felt after the first week; if there is still any nodule; the duration of correction.

10.7 Fillers and Chemical Peels

The big difference with the combination of fillers and chemical peels lies on the type of dermal filler to be used. Absorbable fillers are degraded locally by inflammatory cells. The higher the inflammation is, the faster the product will be digested. Deep peels produce extensive inflammation and may interfere with the dermal filler duration if injected previously. Ideally, dermal fillers should be injected after the inflammation has subsided. A good indication is when skin redness diminishes, which in some cases can be over 1 month. Superficial peels and absorbable fillers may be undertaken in the same session, as almost no important inflammation results and interfere with the product degradation. As the skin may become sensitive after the superficial peel, dermal fillers are preferably injected before the chemical peel. Medium-depth peels may produce enough inflammatory response and it should follow the same rule applied for deep peel. The timing is different, though. Usually, two weeks after the midpeel is enough to have the absorbable filler injected.

The association of chemical peels and nonabsorbable fillers present less concern with timing when compared to absorbable products. As nonabsorbable fillers are normally injected in the subdermal layer or in the subcutaneous fat, dermal inflammation will interfere partially on the filler molecules that are not easily degraded. Based on this, nonabsorbable fillers may be injected prior or after superficial, medium-depth, or deep peels (Table 10.5).

Do's

- Do combine superficial chemical peels with injectable fillers for a quick rejuvenation with no downtime for male patients.

Don'ts

- Do not inject biodegradable fillers with midpeels or deep peels. The duration of filler permanence will be shorter.

Key pointers

- Male patients really do benefit from the association of chemical peels with injectable fillers. The former improves the skin aspect while the latter replaces volume and improve folds
- The combination of midpeels and fillers are proper for static wrinkle treatments. Midpeels reduce the tiny superficial skin wrinkling while injectables improve intermediate and deep wrinkles and folds

Table 10.5 Association of fillers and chemical peels in the same session

	Biodegradable fillers	Non-biodegradable fillers
Superficial peels	Possible	Possible
Medium peels	Avoid but possible	Possible
Deep peels	Avoid	Possible

FAQs

What is the most frequent combination of chemical peels and injectable fillers for male patients?
The most common association for male patients is the treatment of nasolabial fold with injectables and superficial peels such as glycolic acid or Jessner's solution.

10.8 Fillers and Light Systems

The benefits and limitations of the combination of fillers and lasers or IPL systems are similar to those of fillers and chemical peels. As we are in the laser therapy era, the association of injectable fillers and nonablative lasers have been increasing more frequently each time (Table 10.6). There seems to be no conflict with the use of HA fillers followed by cool touch and smooth beam as well as IPL and radio frequency. No histological difference was evidenced on the treated area with fillers vs. nontreatment controls (Goldman et al. 2007).

There is no contraindication to perform fractional lasers over fillers. There has been no acceleration in degradation of fillers, including hyaluronic-based fillers, collagen-based fillers, and even with calcium hydroxylapatite. The volume required for fillers may be reduced after the nonablative fractional resurfacing is completed.

The use of HA or nonabsorbable fillers with ablative lasers has also been tested (Trelles et al. 2005). Once the filling is finished with nonabsorbable fillers, ablative laser resurfacing can take place, either with CO_2 or Er:YAG or both. Both systems are indicated for the treatment of perioral wrinkling. The combination of fillers and ablative lasers enable the correction of small wrinkling, deeper defects, recover facial volume, and restore the perioral cosmetic unit. Male patients also present the same ageing features as women do for the lips. However, they are not as numerous as the women's treatment area, just the opposite. With age, male lips also lose their turgidity, volume, and muscular tone. The skin loses vitality, dehydrates, and forms wrinkles. Fillers are used to re-establish the lip structure and can be limited only to injection along the transition line between the skin and mucosa. If needed, they are also used to increase the volume of the male lip. With the combination of laser resurfacing, the recovery of the male senile lip can be obtained.

Do's

- Do promote volume replacement in male patients and skin texture improvement with nonablative systems.

Don'ts

- Do not forget to prescribe antiviral herpes medication whenever male patients are treated in the perioral area and lips with injectables and ablative or nonablative systems.

Table 10.6 Possibilities of association of light systems with injectable fillers

	Biodegradable fillers	Nonbiodegradable fillers
CO_2 laser resurfacing	If injected in the same session, the duration of the filler may be shorter due to intense inflammatory healing reaction	If injected in the same session, it is advisable to do it before laser resurfacing due to intense edema that may alter anatomy
Er:YAG laser resurfacing	Fillers may be injected in the same session, preferably before due to possibility of profuse bleeding after the laser application	The same rule follows here as for the biodegradable fillers
Nonablative rejuvenation treatments	Fillers may be injected either before or after the procedure. As many injectors use nerve block for filler injection, that may promote more comfort for male patients during nonablative treatment	The same rule follows here as for the biodegradable fillers
Fractional lasers	Fillers should preferably be injected before in case edema or intense patient discomfort results after laser treatment	The same rule follows here as for the biodegradable fillers
Radiofrequency devices	Better if injected after edema has subsided	Fillers may be injected either before, in the same session or after edema has subsided
Q-switched lasers	No problem to treat a tattoo over an area that was previously injected with biodegradable products and vice and versa	The same rule follows here as for the biodegradable fillers
Pigment, vessels or hair removal devices	No problem to remove a hyperpigmented spot, telangiectasia or hair over an area that was previously injected with biodegradable products and vice and versa	The same rule follows here as for the biodegradable fillers

Key pointers

- The association of injectable fillers and nonablative lasers are becoming more frequently every time.
- Although very effective, the association of biodegradable and nonbiodegradable fillers with CO_2 lasers are rare due to long downtime for male patients.

FAQs

What male patients should expect from the combination treatment of injectable fillers and nonablative lasers?

First of all, they must be aware that while fillers provide a fast, usually one-step treatment, nonablative treatments require multiple sessions. Fillers focus on a specific area or cosmetic unit, while nonablative treatments work on improving the ageing signs of the skin.

10.9 Fillers and Mini- and Microlifts

Modifying facial contour involves three-dimensional change. Traditional facelift procedures are limited because of their two-dimensional nature. Simple tightening of the thin skin, subcutaneous, and SMAS layers also does not modify or improve facial contours. Repositioning of malar fat pads, platysma muscle placation, and SMAS rearrangements may be helpful, but volume replacement is sometimes mandatory. Lean-faced male patients with strong noses who exhibit weakness of the malar or chin skeletal prominences and saggy skin are candidates both for fillers and a facelift.

The midface approach should address the repositioning of ptotic soft tissue and volume loss. Areas of importance for volume replacement are those where volume loss is most prominent and include the tear trough/infraorbital rim, the malar eminence, the submalar region, and the nasolabial fold. Other areas where volume loss may also be found in some male patients are the temporal fossa, the jawline, the glabella, the lateral brow, and the perioral region. The Table 10.7 shows a suggestion of sequence for combining fillers and microlift procedure in male patients. However, if the male patient cannot be subjected to it, try to associate only underchin liposuction and fillers. The results are very attractive to male patients (Figs. 10.14a, b and 10.15a, b).

Table 10.7 Ten steps when combining injectable fillers with mini- and microlifts

Sequence	Procedure	Comments
0	Infraorbitalis and mentalis nerve block	Male patients receive oral sedation with midazolam
1	Full correction of deep nasolabial fold and marionette lines with fillers	Lip contouring and augmentation if needed should also be undertaken now
2	Anaesthetic infiltration of the face and neck area	There is no problem as the injected area with fillers will not be surgically touched
3	Under chin effective liposuction	This procedure enables the reshape of the neck area and the mandible border
4	Minimal pre and retro-auricular skin undermining	The less the skin is undermined the smaller the final scar will be
5	SMAS plicature both anteriorly and posteriorly	This plicature is helpful to improve the jowls, cheek and neck laxity
6	Minimal skin removal and suture	The more skin is excised the bigger the final scar will be
7	Compressive bandage	As no drains are used due to minimal skin undermining, compressive bandages are kept until the following day
8	Post-operative care	Manual lymphatic drainage speeds up the edema resolution
9	One month after evaluation	It is already enough to check if further volume replacement will be necessary
10	Improve male facial aesthetics by using fillers into the chin or cheekbone areas	Amazingly male patients do benefit from an effective volume replacement into the chin area and a mild one at the cheekbone level

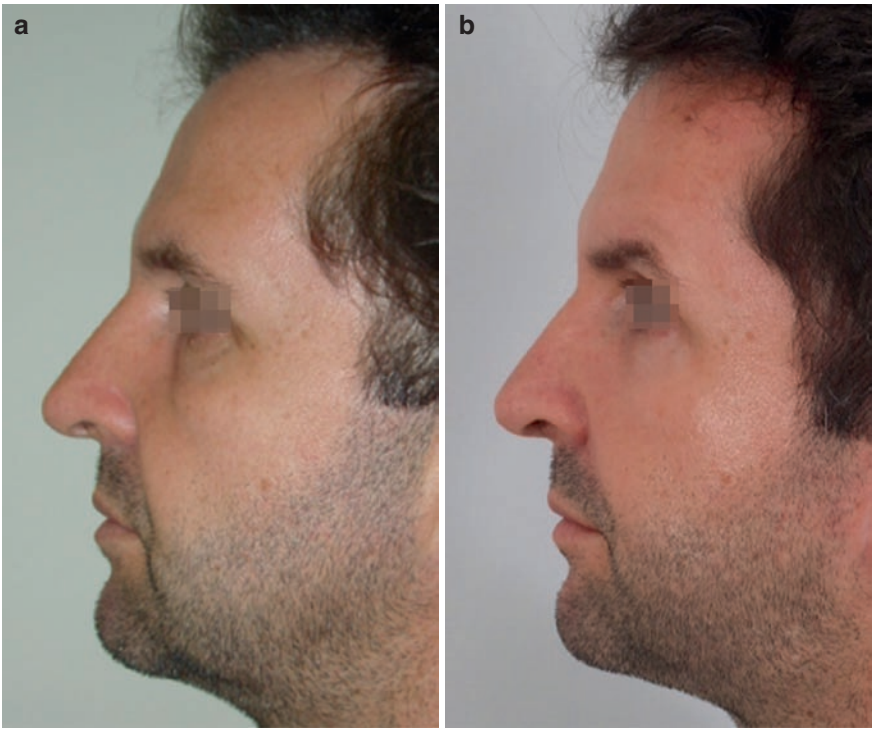

Fig. 10.14 (**a**) The use of fillers associated with the Microlift procedure is very attractive to male patients. (**b**) This patient was also subjected to eyebrow lifting with surgical threads.

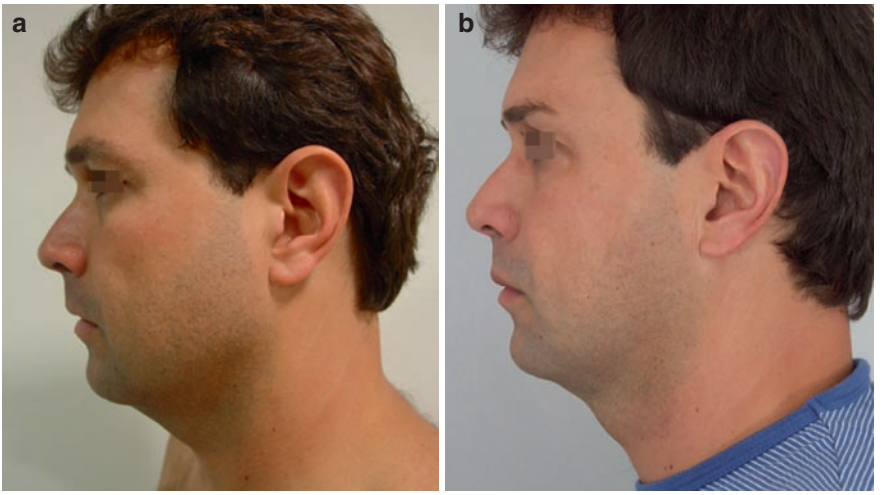

Fig. 10.15 (**a**) Patient presenting a depression on the medial cheek and fat deposit under the chin. (**b**) Patient was subjected to liposuction of the submental area and treatment with injectable fillers into the cheek and upper lip. A more pleasant profile is obtained.

Do's

- Do insist all male patients who are candidates for any facial lift procedure to associate fillers.
- Do insist to treat the male senile lip during the surgery. It is the proper time due to sedation and will provide rejuvenation of the perioral area.

Don'ts

- Do not overdue neither excessive skin pulling nor volume replacement in male patients.
- Do not forget that lips, cheekbones, chin, and nose are areas that should be treated with adequate volume in combination with cosmetic facial surgery in male patients.

Key pointers

- It will be very soon a global tendency to associate injectable fillers into the nasolabial fold and marionette lines before any male facial lift procedure. Less skin pulling is required and a more natural result is evidenced.

FAQs

What is the advantage of combining injectable fillers and male facial lifts procedures?
By filling the nasolabial fold and the marionette lines with fillers immediately prior to facial surgery, an important correction of mid and lower face ageing signs are obtained. So, male face lifts become much more natural due to lack of excessive skin pulling.

Can fillers be injected after the male facelift procedure and if so, when is the proper time for that?
Yes. In this specific case, injectable fillers are used to improve facial lift results. Fillers are mainly injected into the nasolabial fold, marionette lines, chin, and cheekbones. The ideal time to inject may vary according to the size of the surgery performed, but as a general rule when and ecchymosis have subsided.

10.10 Ablative Lasers and Minilifting

The combination of CO_2 laser and a face lift procedure is beneficial for a male patient when there is skin laxity that can only be improved by surgery and when the quality of the skin is poor (Fig. 10.16). Skin indications for laser resurfacing include severe photodamage or scarring caused either by acne or trauma.

These procedures usually require general anaesthesia and tumescent infiltration. The skin incision is made mostly in the pretragal area. It is important to leave an evident hairless area along the preauricular region in male patients (discussed in Chap. 11). Incisions are avoided in the temporal region in male patients, either because they will not benefit from an

Fig. 10.16 When combining CO_2 laser resurfacing with minilifting, the skin undermining should be shorter. Care has also to be taken with the CO_2 transition between the irradiated and nonirradiated area and the position of hairline.

elevation at the lateral portion of the brow or an incision at this level would be too evident in patients with few hairs. The retroauricular incision is performed up to the upper third of the auricle and extension to the hair is avoided. The extent of the subcutaneous undermining is normally dependent on the skin laxity. However, as CO_2 laser is to be used afterwards, the extension of the skin and the fat flap should not be excessive. On the contrary, it should only enable to perform the preparation of the superficial musculoaponeurotic system (SMAS) plicature and its posterocranial repositioning. There are different ways that the SMAS can be tightened. The upward and lateral plicatures are the most common. For skin removal, it is very important to adjust the skin in its new position without any tension and pay attention to the beard area. The skin excision should be conservative in male patients.

Before CO_2 laser resurfacing starts, the skin should be dry and any remaining blood should be cleaned with 3% hydrogen peroxide or saline solution. Independent of the device used, the forehead, nose, malar areas, and chin are treated with high-energy settings. Usually, two passes suffice in those areas. The skin flaps and the periorbital area should be treated with much lower energy, just above the ablation threshold with a single pass. At the end of the surgery, the debris is removed with saline water and a sterilized dressing is placed in contact to the skin. A slightly compressive tubular dressing is applied for hematoma control. After 24 h, the dressings are removed and the treated areas are left open.

Do's

- Do combine an ablative laser with minilifts procedures in male patients. The pulling of skin with poor quality interferes with the judgement of the final cosmetic result.

10

Don'ts

- Do not undermine the skin flap excessively during the facial surgery if a CO_2 laser is to be used afterwards in the same session.

Key pointers

- Male patients should have a hairless area in the pre-auricular region. Hair bulbs can be removed with either scissors or cauterized by inverting the skin and working on the subcutaneous layer.
- When considering the associating of CO_2 laser after facial lifts in the same session, skin flap undermining should be less extent and much lower laser should be employed.
- In case that skin undermining should be more aggressive, it is advisable to select an Er:YAG system, if combination is necessary.

FAQs

What are the advantages of combining minilift and an ablative resurfacing for a male patient in the same session?
First of all is the principle of the indication. Both procedures should be associated in male patients when there is skin laxity at the cheek, mandible, and neck level and the quality of the skin is very poor such as severe photodamage and especially the presence of severe acne scars.

What are the complications of the association of facial lift surgery followed by CO_2laser skin ablation?
Usually, it is considered a safe procedure if some rules are followed.

Top 10 key pointers

- Male patients should never be over-treated with BoNT-A or injectable fillers. The single use of either BoNT-A or dermal fillers may occasionally lead to overcorrection and the risk of unnatural result becomes higher.
- Patients treated with PMMA may be subjected to facelifts or other facial surgery, CO_2 or Er-YAG laser resurfacing, intense pulsed light, and radiofrequency without difficulty.
- The most common association of treatments in male patients are BoNT-A, fillers, and nonablative resurfacing.
- Male patients may be injected with biodegradable injectables in the same area where nonbiodegradable products were injected and vice and versa.
- For a very natural male face lift procedure, inject fillers first into the nasolabial fold and marionette lines up to full correction and then promote an effective SMAS plicature with a very subtle skin pulling. That is the Microlift principle for male patients.
- The association of underchin liposuction with BoNT-A and/or injectable fillers promote amazing results with very short downtime.
- When combining CO_2 laser resurfacing with minilifting, the skin undermining should be shorter. Care has also to be taken with the CO_2 transition between the irradiated and nonirradiated area and the position of hairline.

- CO_2 laser resurfacing is not popular among male patients or any of the possible combinations with it due to prolonged downtime.
- It will be a global tendency to inject nasolabial fold and oral commissures prior to any cosmetic facial lifting surgery in male patients due to a reduction of skin undermining and a more natural result.
- Combination therapy works even better in male patients than in females. So do it!

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The Male Microlift and Surgery in Male Patients

11

Maurício de Maio

11.1 Introduction

An ageing male population and a wider social acceptance of cosmetic surgery have resulted in an increased demand for procedures to rejuvenate the face and neck of male patients. In our society, there is a pressure to appear young and energetic. Active men strive to maintain their appearance through exercise and good habits, but this is not sufficient and need to turn to cosmetic procedures and ultimately to cosmetic surgery.

For some patients, the available options for facial rejuvenation do not necessarily satisfy all of their needs. The techniques may require surgery and general anaesthesia, may be uncomfortable, may be expensive, may require long recovery periods, or may require the use of bandages or drains such as facelifts. In addition, some procedures may not be an option for certain patients. The health of men of a comparable age may not be as good as that of females. Men are more likely to have worked without sunscreens, among other risky behaviors, which include not following medical advice. When preparing a man for surgery, it is advisable to remember that high blood pressure and heart disease may be present but undiagnosed, causing a higher anaesthetic risk and so are smoking, alcohol abuse, and bleeding disorders. Male patients are also concerned that others may not know that they have had a procedure. Bruising and edema can occur following liposuction, redness and inflammation after chemical peel, and unnatural contours with injectable fillers. Facelifts can result in a pulled appearance of the skin, pixie ear deformity, visible incision lines, and loss of temporal hair (Kridel and Liu 2003; Mowlavi et al. 2005).

So, what is the concept of cosmetic surgery? As published before, it is "The use of surgical procedures, in the absence of disease or physical trauma, to alter the physical appearance of the body in pursuit of psychosocial benefit" (Grossbart and Sarwer 1999). The target of the male cosmetic surgery is to minimize the effects of ageing that include loss of skin tone and facial volume with the atrophy and descent of facial fat. Men are seeking cosmetic facial surgery in steadily increasing numbers. However, the majority of male patients are not seeking extensive surgery but rather a more focused, limited treatment plan (Brackup 2003). In addition, they fear the surgery and the use of general anaesthesia and are concerned about the cost of the procedure (Zide 2003). For some cosmetic surgeons, male patients constitute 25% of all requests for cosmetic facial surgery (McCollough 1993).

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A very good alternative for male patients is the Microlift technique that will be described below.

Key pointers

- Concise preoperative analysis and planning are indispensable in the management of male patients presenting for facial rejuvenation.
- Men usually consider facial rejuvenation procedures at an older age than does women.
- Male patients are usually not as tolerant of pain, healing, or time issues as some women are.
- Most men do not have the means to camouflage the signs of surgeries effectively as women do.
- Less risky, less painful procedures with less down time have greater appeal with everybody, but especially to men.
- The idea of having surgery may be more stressful for some male patients.

FAQs

What are the topics that male patients find stressful when deciding to undergo cosmetic plastic surgery?
The need of planning for down time; the desire to keep the subject private from others; the unwillingness to wear makeup to conceal the postoperative bruising are among the most common potential problems.

11.2 The Male Microlift

In a previous article (de Maio 2004), the minimal approach, an innovation in facial cosmetic procedures that is faster, less painful, and less costly than surgical face lifts has been discussed. The technique utilizes a variety of biodegradable injectable products and BoNT-A to improve the appearance, with a fast and relatively painless lunchtime procedure. I have expanded on this and developed the Microlift procedure, which involves a combination of techniques to improve the duration of the improvement of facial appearance.

The Microlift face lift appeals to male patient who seek a more long-lasting improvement than does fillers and surface treatments offer, but without the discomfort and cost of a surgical face lift. The technique utilizes three common treatments to improve facial contours: liposuction of the neck and under the chin, injection of facial fillers into wrinkles and folds, and suspension and anchoring of facial muscles using surgical threads (Figs. 11.1a, b and 11.2a, b). The upper third is treated with injection of BoNT-A and light chemical peels may be added in case the skin needs conditioning. Male patients appreciate that the Microlift technique offers little scarring, minimal discomfort, and a quick recovery time. It is intended to be a less invasive, less aggressive option to combat the signs of ageing than a facelift.

The ideal male candidate for the Microlift procedure is a patient with moderate skin laxity at the mandible level, excess submental adipose, and good skin elasticity. By comparison

Fig. 11.1 (**a**) Patient with low eyebrow and skin excess in the upper and lower eyelid. The mid and lower faces also show saggy skin with deep nasolabial fold, oral commissure, and jowls at the mandible level. (**b**) The patient was subjected to the Microlift procedure with injectable fillers into the nasolabial fold and oral commissure. Upper and lower eyelid surgery was also undertaken.

Fig. 11.2 (**a**) and (**b**) This patient was subjected to the Microlift procedure. There is an improvement of the saggy skin both in the cheek area and in the neck. This result pleased the patient because the downtime was not long. Note that with this technique, the sideburns are maintained in position.

to face lifts, the Microlift procedure is an office-based procedure that uses local rather than general anaesthesia; no hospital stay is required (patient can be discharged to home with adequate supervision). The recovery period is brief. There are no obvious signs after the procedure (no hematoma, no need for drains or complex bandaging).

11.2.1 Technique

The patient is administered oral sedation with midazolam followed by local anaesthetic infiltration and nerve block. The first step is liposuction of the neck and under the chin. The patient is marked and areas of adipose tissue deposit are delineated. A small incision is made under the chin and an infusion cannula is used to deliver tumescent solution. A 2.5 mm liposuction cannula is then used to remove adipose tissue through the incision. Syringe-assisted liposuction is utilized regardless of whether the patient has mild, moderate, severe fat deposit. When attention is paid to platysmal bands and salivary gland prominence, this is a safe procedure with good results and few complications (Morrison et al. 2001). The tiny incision used for liposuction of the neck is sutured with mononylon 6.0.

In the second step, reshaping of the mandible border, the jowls, and excess neck skin is achieved with suspension and plicature of soft tissues with polypropylene (Prolene) 3.0 thread. Other surgical sutures can also be applied such as 3.0 mononylon or 3.0 mersilene. A small incision is made inferior to the earlobe depending on the amount of soft tissue to be lifted; it should start from the pretragal or retro-tragal area down to the retro-auricular area (Fig. 11.3). To minimize the size of the scar is to promote minimal skin undermining. Through this area, the Superficial Muscular Aponeurotic System (SMAS) can be plicated. The SMAS supports the soft tissues of the face and the plicature and suspension techniques uplift the SMAS and the facial soft tissue as well. To minimize scar size, for more distant saggy areas, the suspending surgical thread is used. A cannula is passed under the skin through the subcutaneous tissue over the mandible and/or the zygomatic area depending on which area(s) is to be suspended. The surgical thread is introduced through the cannula and laced around the SMAS. The thread is pulled to the desired uplifted suspension. Overpulling should be avoided to prevent the skin from being uneven and dimpled. The thread is knotted and anchored to the ear cartilage. A purse string suture is used to gather skin behind the ear. Minimal skin resection should be undertaken to also minimize the scar size.

The minimal skin undermining should be sufficient enough to plicate the SMAS and to allow the cannula insertion. Owing to also minimal skin resection, this technique enables the skin to adapt to its new location, and as a result, no pulled appearance of the skin, pixie ear deformity, scar tension, or hairline modification is evidenced.

In the third step, fillers are injected along the nasolabial folds, the marionette lines, the cheekbones, and chin to correct volume depletions. The choice of material for injection and the depth at which it is injected (superficial, middle, or deep dermis) is optimized to maximize the correction. BoNT-A is injected into the upper third to improve brown ptosis, forehead and glabella lines, and crow's feet. Light chemical peels may also be used for some patients to further refine skin defects.

Fig. 11.3 This is a typical retro-auricular incision after the Microlift procedure in a male patient.

Key pointers

- The Microlift face lift is a minimal invasive surgical procedure that uses several minimally invasive techniques to erase ageing signs in the face.
- Neck and chin liposuction, SMAS plicature, and soft tissue suspension through a minimal earlobe scar are combined to treat the lower third of the face and neck.
- Injectable fillers promote volume replacement and rejuvenation of the mid third of the face.
- Injection with BoNT-A enables the treatment of hyperkinetic muscles and improvement of the upper third of the face is obtained.
- Light chemical peels are used for skin conditioning, if needed.
- The technique is done in an out-patient setting, and the entire process can be completed in one session lasting approximately 40 min when experienced.
- The male patient leaves the office with minimal discomfort and little evidence that he has undergone a surgical procedure.
- The recovery period is brief and patients typically return to work and social engagements much earlier than they might, following surface facial treatments or full facelifts.

- The Microlift technique is especially attractive for male patients who want to see immediate results with a minimal investment of time and cost when compared to any other facial lift surgery.
- The results of the technique are quite favorable and patients appreciate that there is no obvious visible sign that a procedure has been done, and complications are minimal.

11.3 Lipoplasty in Male Patients

Lipoplasty with procedures such as liposuction and autologous fat transfer is very appealing to male patients. A number of facial regions are amenable to Lipoplasty, including the submentum, lateral neck, jowls, and buccal, and nasolabial areas. The submental and neck lipoplasty is frequently requested because it offers the potential for remarkable improvement in the cervicomental angle with limited downtime. The cannulas used in the head and neck are shorter and smaller than those for body liposuction.

Traditional techniques of lipoplasty have been employed over three decades and new technologies have been created to improve the accuracy and efficiency of fat removal. Powered liposuction offers the possibility of more efficient and less labor-intense fat removal, which does not justify the cost of equipment when only face and neck are to be treated (Katz and Maiwald 2005). Other methods such as laser lipoplasty were discussed in Chap. 7. For head and neck applications thus far, there does not appear to be any compelling evidence to warrant laser lipoplasty.

11.3.1 Fat Grafting

Facial restructuring with soft-tissue augmentation requires a large quantity of volume and this would impact our patients with high costs if fillers available in the market are to be used. The advantage of fat grafting over any other filler is that volume is not an issue. Another aspect to be considered is that fat can be frozen and stored for posterior filling procedures. The idea of fat removal, even in small quantities, is very pleasant for the male patient, as long as it is evident in facial or body reshape. Fat can be removed from the under chin area, which provides a very nice facial contour in male patients, as well as from the inferior abdomen or flanks where fat gets accumulated in male.

The disadvantage is the size of the procedure itself, which when compared to dermal fillers is considered enormous and more complex. Any injector even if he or she is a beginner is able to perform soft-tissue augmentation with commercial dermal fillers. Cosmetic fat restructuring in the face requires expertise and adequate environment. This is one of the main reasons why lipofilling has been decreasing over the years. Another aspect that should be considered is that severe volume deficits must be corrected with multiple small deposits injected at several visits, achieving augmentation over an extended period of time (Vleggaar and Forte 2006). Despite all this, it is a very rewarding method both for the physician and for the patient.

11.3.2 Anaesthesia

The development of tumescent anaesthesia enabled liposuction to be performed under local anaesthesia alone (Coleman and Hendry 2006). The patient should be placed under monitored anaesthesia care either with intravenous or oral sedation. When fat transfer is performed as a sole procedure, oral sedation is the best option.

A 20-mL syringe is filled with tumescent solution (1 mL of 1% lidocaine with 1:100,000 epinephrine, 4 mL of 1% plain lidocaine, and 15 mL of isotonic sodium chloride solution) and is infiltrated in a fan-like pattern either with a long needle or a long cannula. Patient's comfort during the procedure may be enhanced by a warmed (40°C), buffered solution during infiltration (Yang et al. 2006).

The total amount of tumescent solution to be used is dependent on the number of aspiration sites and mainly on the total amount of lidocaine injected. There has been much controversy as to the maximum amount of lidocaine that can be used during tumescent liposuction. The standard injection limit of 7 mg kg^{-1} is common in most soft-tissue infiltration; however, in tumescent solutions, lidocaine is safely administered at levels of 35 mg kg^{-1} and even as high as 50 mg kg^{-1} (Kucera et al. 2006).

11.3.3 Fat Retrieval

Before the infiltration of local anaesthesia, the areas to be injected with fat should be delineated with a marking pen to help in estimating the amount of fat needed. For male patients, the best fat harvest sites are the underchin, the abdomen, and the flanks. An incision is made using a blade of No. 11 or 15 size; the 2.5 or 3.0 mm liposuction cannula is attached to a 20-mL syringe and a vigorous forward and backward movement is started. The dominant hand is used to perform manual aspiration of the fat while the other can be used to guide the cannula in the proper plane. When aspirating in the abdominal area, it is advisable to stay in a relatively superficial plane to avoid any trauma to the underlying rectus muscle. The stab incision maybe closed using a 6-0 mononylon suture.

11.3.4 Neck Liposuction

It is an excellent treatment modality with dramatic results for male patients (Fig. 11.4a, b). Male skin usually presents an inherent better elasticity than the female skin, and redraping of the skin over areas devoid of fat results in a very pleasant neck contour. A single incision is placed behind the submental crease or two bilateral incisions anterior to mastoid are performed for more aggressive and tailored contouring in uncommon full neck. Small cannulas of 2.0–2.5 mm are ideal for short radial strokes. Suctioning at the subdermal level is not recommended because this may cause skin loss from injury to the subdermal vascular plexus, surface irregularities, pigmentary changes, and prolonged induration (Teimourian 1989).

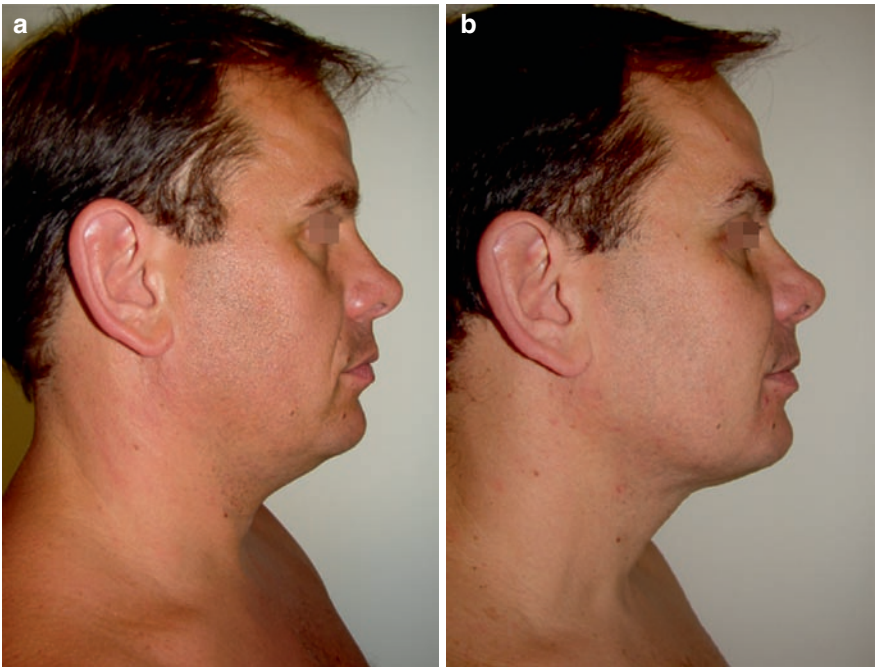

Fig. 11.4 (**a**) Submental liposuction should be undertaken in all male patients who present with poor neck definition on the profile. (**b**) After a simple procedure under local anesthesia and practically no downtime, a more pleasant look is obtained.

Complications are avoided by preserving a layer of fat on the skin flap. Overly aggressive suction lipoplasty can create a new contour deformity and expose platysmal laxity and banding not seen previously.

Suction lipoplasty was always indicated more for young patients with good skin tone. It has been expanded especially to male patients of 50–70 years old, with satisfactory results, as the localization of the fat was mainly in the midline and for those with skin of good tone (Figs. 11.5a–c; Gryskiewicz 2003). Patients with thicker skin and severe ptosis at the lateral mandible border may also need a lifting procedure at this level. Failure to distinguish excess laxity and tissue descent from excess fat will lead to poor results, as patients with excess laxity also need lifting in addition to lipoplasty (Haack and Friedman 2006). Chin augmentation should be included for patients undergoing suction lipectomy of the neck. It improves the contour of the neck by better defining the anterior jawline in profile (Byrd and Burt 2002).

11.3.5 Fat Processing

Fat processing can vary either from simple washing with saline solution or subjected to centrifugation for 3–5 min at 3,500 rpm. Saline washing and filtering is an effective method

Fig. 11.5 (**a**) The formal indication for this patient would be a minilifting. However, he had no time to be away from his professional activities. (**b**) After 30 days of under-chin liposuction and upper lip filling with HA. (**c**) Two months after the liposuction and the skin retraction has already improved and is expected to retract more up to 6 months.

of separating the fat from the residual fluid, followed by isolation in syringes. The centrifugation method separates the fat into three distinct layers: the top layer consists of oil from ruptured adipocytes, the central area is the usable fat, and the bottom layer contains lidocaine, saline solution, and blood/serous fluid. The usable fat is then separated from the fluid and then inserted into 1 mL syringes.

11.3.6 Fat Transfer

Usually a 16-Gauge blunt cannula is used for the lipofilling procedure. An 18-Gauge needle is used to create small stab incisions at the sites of entry. The areas to be treated should be marked-out previously. In general, the mid and the lower faces are where fat grafting presents its major advantages due to volume requirements. The tear-trough, the malar eminence, the submalar region, and the nasolabial crease are the landmarks of the mid face and should have their volume restored. In the upper face, the brow, the glabella lines, the upper eyelids, and the temples may also be restructured by facial grafting. In the lower face, the marionette grooves, lips, chin, and the jawlines may also be treated with fat replacement.

The fat should be injected in small amounts on withdrawal from many different angles and into multiple tissue levels. Tear-trough and eyebrows are exception where the fat should be injected at a minimal amount (0.03 mL per pass) in the deep plane just superior to the periosteum and along the lower and upper orbital margin.

Multiple microinjections of very small volume of unprocessed fat seem to be the best option for fat transfer. The injected fat must be placed within a few millimetres of a vascular supply to survive and to be maintained (Coleman 2006). Long-lasting results are also obtained by fat autograft muscle injection (Butterwick et al. 2007).

11

11.3.7 Complications

The most common drawback from the fat transfer is the prolonged postoperative edema and ecchymoses that results from the multiple tunneling approaches. Other reported complications include undercorrection, overcorrection, tissue irregularities, asymmetries, and hematoma (Pontius and Williams 2006).

Do's

- Do remove fat from the under chin area. Besides using it as a volumizer in other areas, it also provides a very nice facial contour in male patients.
- Do prescribe only oral sedation for male patients when fat transfer is performed as a sole procedure.

Don'ts

- Do not forget to freeze some fat retrieved from male patients. It can be used as efficient volumizers in the future.

Key pointers

- The advantage of fat grafting over any other filler is that volume is not an issue.
- The idea of fat removal, even small quantities, is very pleasant for the male patient, as long as it can be evident in facial or body reshape.
- The best fat harvest sites for male patients are the under chin area, the abdomen, and the flanks.
- Saline washing and filtering is an effective method of separating the fat from the residual fluid.
- The mid and lower faces are where fat grafting presents its major advantages due to volume requirements.
- Submental liposuction is an excellent treatment modality for male patients who can yield dramatic results.
- Chin augmentation should be considered whenever facial rejuvenation is considered. Inadequate chin projection may detract from a better result in facial rejuvenation procedure.

FAQs

Why has lipofilling been decreasing over the years?
New fillers have been introduced into the marked at a very quick pace and media has helped them a lot to seduce patients and injectors. But, one of the main reasons is that cosmetic fat restructuring in the face requires expertise and adequate environment.

11.4 Eyebrow Lifting

During the ageing process, a series of changes take place in the brow area. In an attempt to recontour the upper face, the brow is often lifted. There are many techniques that were described for this purpose, but not all of them are suitable for male patients. Techniques include a direct suprabrow incision, a mid forehead lift, a coronal flap, suspension sutures, a transblepharoplasty approach, and endoscopic procedures (Ramirez 1996; de Cordier 2002). Fat grafting techniques target to fill and lift the eyebrow to promote three-dimensional augmentation. Fat is added to the supraorbital ridge area and to the eyelids, if necessary (Coleman 2001). This approach has many advantages, especially for younger patients.

The minimal and more suitable procedures for male patients include the suspension suture and the transblepharoplasty approach (Fig. 11.6a, b; Erol et al. 2002). Depending on the need of each patient, combining brow lifting with blepharoplasty is what gives the best result for eyelid–eyebrow unit (McCord 1990). It is important to highlight that because the male eyebrow sits lower than the female brow and is flatter in contour, inadequate surgically male brow lifting may actually feminize the patient's appearance if it is overlifted or the arc of the curvature is too accentuated. Overlifting the male eyebrow can also result in the appearance of surprise or angered, if the lateral portion is elevated more than the medial portion.

If no eyelid surgical procedure is to be undertaken, another minimal invasive procedure is the use of lifting surgical threads. Complications such as asymmetries or short-term duration of result have disappointed both patients and surgeons. The muscles that act at the brow level avoid the correct positioning and fixation of the threads at its right position. Pretreatment with botulinum toxin into the frontalis, corrugators, procerus, and orbicularis oculi enable the blocking of those muscles and in lifting of the eyebrow. Ideally, BoNT-A

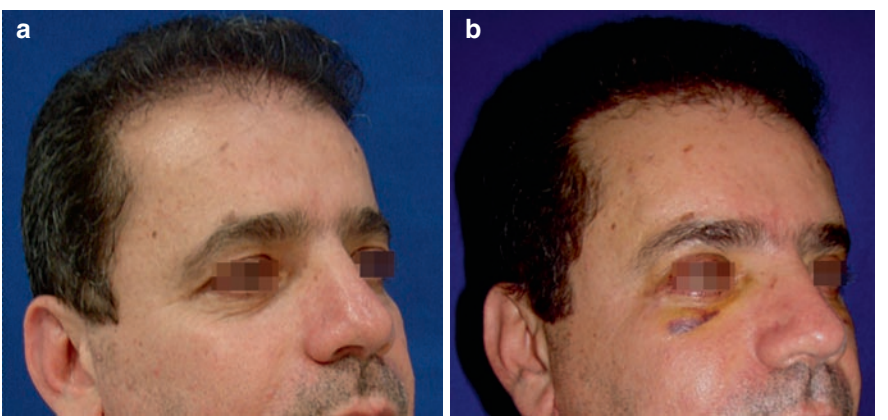

Fig. 11.6 (**a**) Male patient with upper and lower skin excess. The eyebrow is typically low in males. (**b**) Five days after upper and lower blepharoplasty with suspension surgical threads (Mersilene 3.0).

should be injected 15 days before the surgical threads procedure. When the proper position of the eyebrow is obtained with BoNT-A, a blunt cannula is passed from the hairline down to the eyebrow and the frontalis is laced by the surgical thread. Usually, a mersilene 3.0 is used to avoid sliding and rupture of muscle fibres found with mononylon and polypropylene. The thread is pulled to the desired uplifted suspension. Overpulling should be avoided to prevent the skin from being uneven. Dimples at the eyebrow level are avoided by not pinching the dermis. The thread should be anchored at the galea (Figs. 11.7a, b and 11.8).

Do's

- Do block previously all the upper third muscles with BoNT-A and then use the suspension threads to provide static support for the eyebrow.

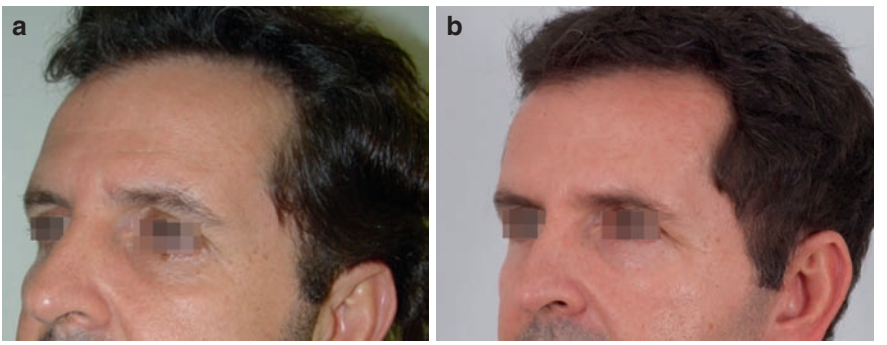

Fig. 11.7 (**a**) Patient with low eyebrow and skin excess in the upper and lower eyelid. (**b**) The patient was subjected to upper and lower blepharoplasty, but the position of the eyebrow continued to be low.

Fig. 11.8 The patient was subjected to BoNT-A injection in the forehead, glabella and crow's feet. After 15 days, he was subjected to a suspension thread that was anchored into his eyebrow and fixed into the galea. Very close to his hairline, a 0.5 cm incision was placed in a forehead wrinkle.

Don'ts

- Do not forget to anchor the surgical thread into the galea to obtain better fixation of the eyebrow in the desired position.

Key pointers

- Inadequate male brow lifting may lead to a feminine look, surprised or angered appearance.

FAQs

What is the most common surgical procedure for eyebrow lifting in male patients?
It is the transblepharoplasty approach. It is quick and no further incision is required.

What is the advantage of blocking the muscles of the upper-third of the face with BoNT-A previously to the use of suspension threads for brow lifting?
The use of BoNT-A will promote the uplifting of the male eyebrow and the absence of movement will enable the surgical thread to adhere to desired position.

11.5 Eye Surgery

The periorbital region perhaps exhibits the highest incidence of congenital asymmetries resulting from ageing. Common sources of asymmetry are unilateral brow or upper eyelid ptosis, globe prominence due to exophthalmos or orbital hypoplasia (producing differences in the aperture of the palpebral fissure), variation of intercanthal axis or tilt or intercanthal dimension between eyes, postural disparities in lower eyelid position, producing unilateral scleral show and differences in malar prominence (McCurdy 2006).

Upper blepharoplasty can be conceived of as a debulking procedure that may resolve the undesirable aspect of the upper eyelid by simply removing the redundant tissue (skin, muscle, and periorbital fat) that reduce the visibility of the pretarsal upper lid. This surgery should generally be more conservative in men than in women, but the postoperative period may require some downtime (Fig. 11.9a, b). The well-defined superior palpebral fold that is desirable in women is not targeted in men. There is no need to accentuate the fold and sulcus as well as the creation of concavity by debulking the tissue overlying the superior fold. The degree of upper eyelid concavity can be controlled by varying the amount of skin and fat excised (Figs. 11.10a, b and 11.11a, b).

If the upper eyelid skin cannot be excessively removed in male patients, this rule must be even stricter to the lower eyelid. The incision for the lower eyelid is placed close to the lower eyelid border and the lateral extension should be placed along a wrinkle to better disguise it. Fat removal should also be subtle but effective to avoid the presence of reminiscent fat and sunken eyes (Figs. 11.12a, b). Cantopexy is also undertaken in the cases of scleral show (Figs. 11.13a, b and 11.14a, b).

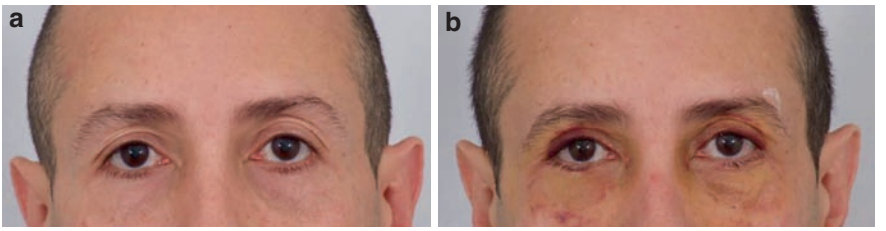

Fig. 11.9 (**a**) Even mild-to-moderate skin excess in the upper and lower eyelid may be undesirable for some male patients. (**b**) Five days after removal of stitches, the male patient may undergo camouflage and go back to work.

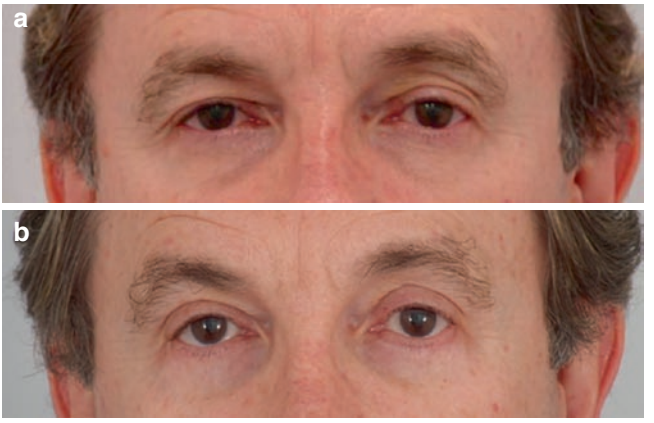

Fig. 11.10 (**a**) and (**b**) Before and after a upper and lower blepharoplasty. Note that skin resection should be moderate in order not to show any evidence of the surgery.

Fig. 11.11 (**a**) Before surgery, skin excess was easily evidenced when the patients closed his eyes. (**b**) After skin removal, the scar is placed in the sulcus and can be barely seen.

Fig. 11.12 (**a**) Note that when the patient looks upwards, the lower eyelid bags are better visible. (**b**) After the surgery, the fat bags cannot be evidenced anymore.

Fig. 11.13 (**a**) Patient with skin excess in the upper eyelid. The lower eyelid presents scleral show, skin excess, and eyebags. (**b**) Upper and lower blepharoplasty with cantopexy. Note that the nose was reshaped with an injectable filler. The patient did not accept surgical nose reshape, and appreciated very much the treatment with an injectable filler.

Do's

- Do treat lacrimal gland ptosis by suture suspension through the upper eyelid incision.

Don'ts

- Do not remove wide muscle strip or too much fat in male patients.

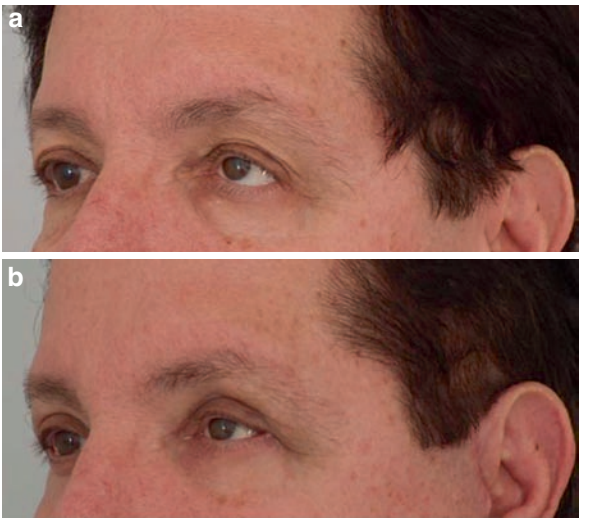

Fig. 11.14 (**a**) Oblique view of the same patient subjected to upper and lower blepharoplasty. There is a senile lagophtalmos that will be treated during the surgery. (**b**) Note the correction of the scleral show in the lower eyelid by cantopexy.

Key pointers

- The eyelid surgery in male patient should always focus partial correction. It is still advisable to leave some excess skin both in the upper and lower eyelid.
- If you imagine that a woman would be dissatisfied with the result of such a small skin resection, male patients will be more happier and with a natural look.

FAQs

What is the main difference between the male and female eye surgery?
Both should be natural, but for male patient skin resection and fat removal should be partial. What would be unacceptable as partial skin resection for female patients is the target for male patients.

11.6 Face Lifting

Most male facelift patients are middle-aged professionals with busy and demanding lifestyles. They may be subjected to minilifting associated with nonsurgical methods such as fillers. It is interesting to combine therapy as much as possible for those patients who have decided to take some days off (Figs. 11.15–11.18).

Manipulation of the superficial musculoaponeurotic system (SMAS) is a common approach to face-lifting techniques, as well as the under chin liposuction. The simplest

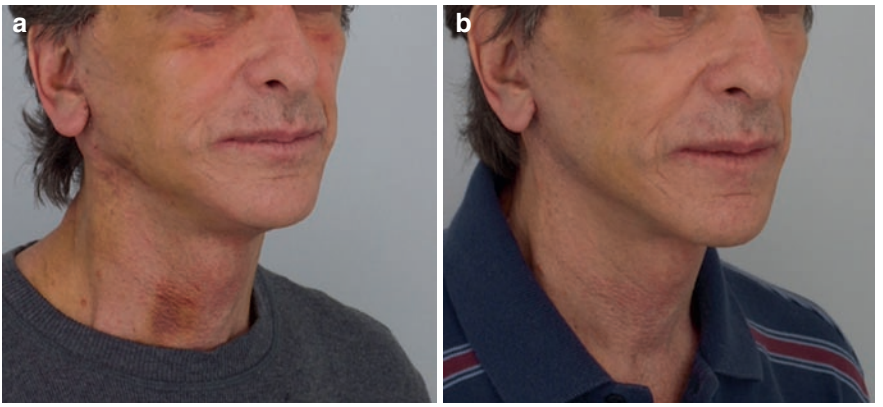

Fig. 11.15 (**a**) This patient was subjected to a minilift procedure and is on the seventh post-operative day. The presence of ecchymosis and edema prevents the patient to return to social and professional activities. (**b**) The same patient after 15 days of the surgery. The ecchymosis can now better be covered by makeup and the patient is able to return to his commitments.

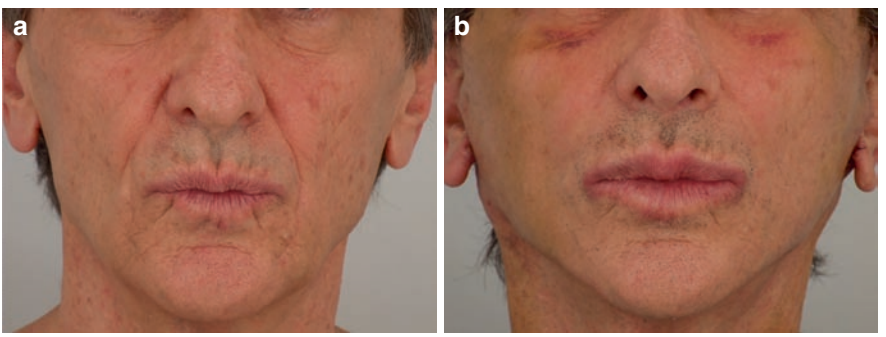

Fig. 11.16 (**a**) This patient was to be subjected only to a minilift procedure and injectable fillers into the nasolabial fold and oral commissure, however, by pursing perioral wrinkling is visible. (**b**) Volume replacement into the vermillion border and body improves the aspect of the senile lips in this patient.

approach is to plicate the SMAS by folding the SMAS onto itself, without SMAS undermining. This technique is very safe because the SMAS and sub-SMAS structures are left intact (Ivy et al. 1996).

The lateral SMAS ectomy approach consists of resecting a strip of the SMAS overlying the parotid gland without undermining, and suturing the resected edges, thereby elevating the lower portions of the SMAS. It is also a safe technique because the facial nerve is protected by the parotid gland (Baker 2000). Other approaches include the conventional SMAS face-lift (limited SMAS flap) or an extended SMAS flap separated from the skin flap and separately repositioned. The deep-plane face lift technique dissection is undertaken above the fascia of the masseter superior to facial mimetic muscles. It improves

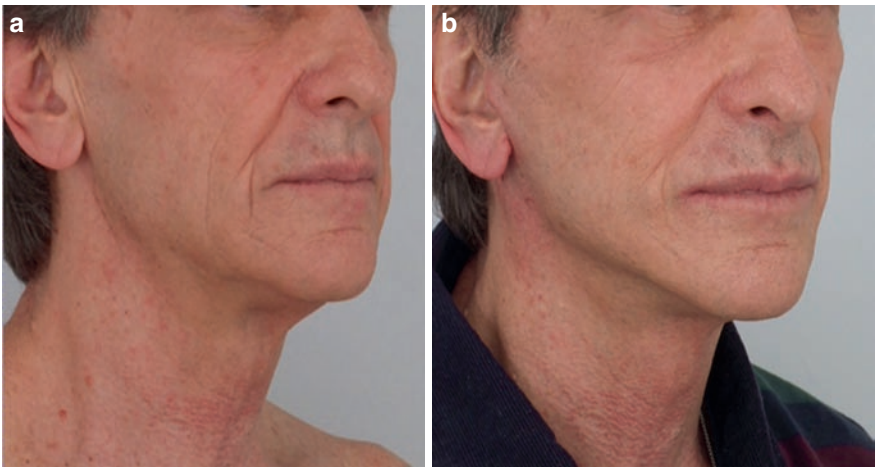

Fig. 11.17 (**a**) and (**b**) Pre and 30 days after a minilifting procedure combined with injectable fillers in the nasolabial fold, oral commissure, and lips. By treating the prominent nasolabial fold, marionette lines with fillers, less skin pulling was necessary and a more natural result for this patient could be obtained.

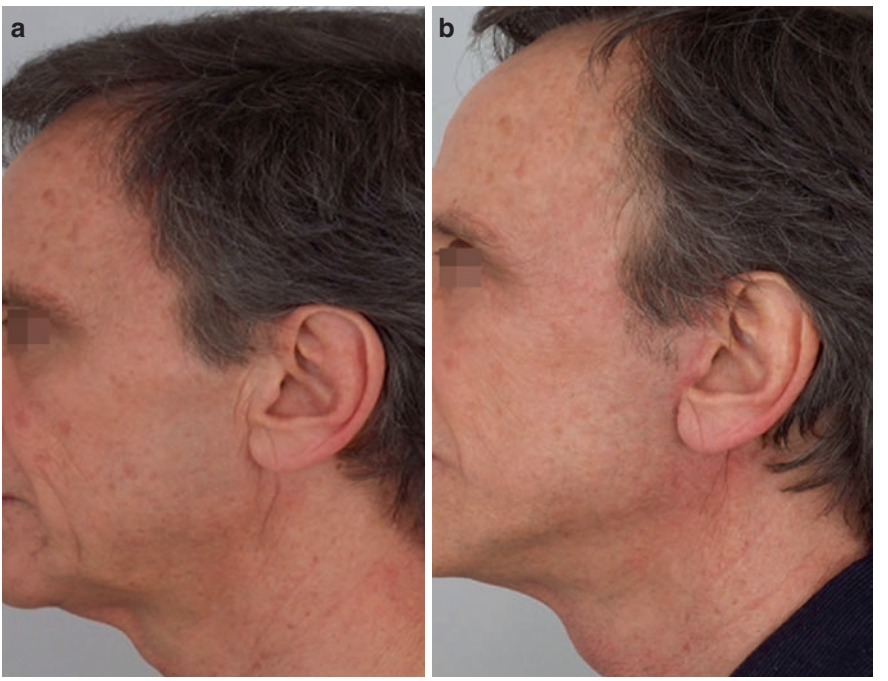

Fig. 11.18 (**a**) Preoperative photo with saggy skin at the cheek and neck. The presence of jowls is also evidenced. Note that there is skin excess and wrinkling at the preauricular area. (**b**) After 30 days, the correction of the saggy skin was obtained. The scar is still red.

the nasolabial fold and elevated the malar fat pad. Elevation of the cervicofacial flap and fixation of the platysma to the preauricular parotid fascia are undertaken to improve the mandible and neck (Papel and Lee 1996). The tissue dimpling below the earlobe, which appears as a result of traction of the platysma and experienced by patients after the surgery, disappears in 1–2 months. Regardless of the technique, the correct hairline and sideburns position should be maintained or laser hair removal will be necessary (Figs. 11.19a, b and 11.20).

Very important to point out is that some male patients are heavy smokers and tend not to stop smoking with enough time for surgery. Incision dehiscense is common in those patients (Fig. 11.21). It is also very important to ask male patients to stop any vasodilator drugs, at least 15 days before the procedure or else may experience a very difficult postoperative period (Fig. 11.22a, b)

Do's

- Do avoid incisions in the temporal region in male patients, either because they will not benefit from an elevation at the lateral portion of the brow, or an incision at this level would be too evident in patients with few hairs.

Fig. 11.19 (**a**) Male patients should be informed before any facial lifting procedure that they probably will to be subjected to laser hair removal in the preauricular area. (**b**) Note that the sideburns cover now the hairless area anterior to the earlobe. This patient has to be subjected to laser hair removal.

Fig. 11.20 After 30 days of the first session of laser hair removal, a reduction in the density of hair in the preauricular area can be observed. Laser hair removal in this area is very effective for male patients due to the thickness of the follicle.

Fig. 11.21 Partial dehiscence of the incision of a male patient who is a heavy smoker. Even with minor skin traction and resection, smokers should be encouraged to stop smoking at least 30 days before the procedure.

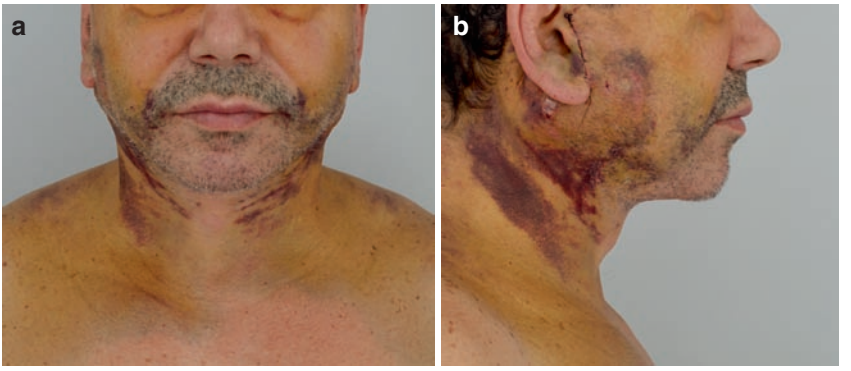

Fig. 11.22 (**a**) and (**b**) Patient subjected to a minilifting procedure. Male patients should be asked to interrupt any vasodilator drug at least 15 days before the surgery. Otherwise, an intense hematoma may result.

Don'ts

- Do not forget to preserve 1 cm of hairless skin in front of the tragus, regardless of the technique. Otherwise, laser hair removal should be employed.

Key pointers

- For some cosmetic surgeons, male patients constitute 25% of all requests for rhytidectomy.
- It is essential to maintain male features such as the temporal hairline and hairless area in front of the ear.
- The retroauricular incision is performed up to the upper third of the auricle and extension to the hair is avoided.
- Facial skin at the beard area is thicker, less elastic, and rougher.
- The presence of richer subdermal plexus at the beard area may lead to hematoma.
- Male patients tend to be more concerned with laxity in the cheek and neck, and deep nasolabial folds. Women tend to focus not only on the lower face, but also on the forehead and eyes.
- Temporary hypoesthesia around the ears may make shaving with blades difficult. An electric shaver is often suggested for this area.
- During the immediate postoperative period, men are less likely to ask for pain medication.
- Men are somewhat less patient with regard to the resolution of normal edema and ecchymosis.
- Male patients tend to be quite pleased with the results, with fewer requests to minor revisions when compared to women.

11.7 Other Alternatives

There are five visual criteria that are characteristic of youthful neck after surgery, which include (1) a distinct inferior mandibular border from mentum to angle, with no jowl overhang; (2) subhyoid depression; (3) visible thyroid cartilage; (4) visible anterior border of the sternocleidomastoid muscle; and (5) a cervicomental angle between 105 and 120° (Ellenbogen and Karlin 1980). There are male patients who have a greater degree of redundancy and may benefit from the inferomedial and inferolateral platysmal incisions and advancement/plication for the improvement of neck contour. Occasionally, male patients do not wish to undergo traditional facelifts. Instead, they may present with complaints of redundant submental skin that affects shaving and hygiene, besides the undesired aesthetic look. A direct anterior cervicoplasty is reasonable for male patients and not too much for women. This direct approach enables the excision of redundant skin, preplatysmal and subplatysmal fat as well as platysma sutures (Biggs and Koplin 1983). It is important to emphasize to the patient that a scar will result regardless of the approach chosen. In such cases where a "turkey gobbler" is present, a direct vertical skin excision or Z-plasty closure may be indicated for fat and skin excision and platysma. Direct excision can provide skin correction not always afforded by suction lipoplasty, but at the expense of a visible but acceptable scar (Miller 2005; Lindsey and Zapanta 2007). This scar is even more acceptable in male than in female patients.

Key pointers

- Male patients who refute traditional facelifts may undergo direct anterior cervicoplasty for the treatment of severe redundant skin.
- Patient evaluation should begin with an assessment of the degree of skin laxity and the amount of preplatysmal fat.
- The submental and the submandibular fat deposits should be palpated, and the presence of malpositioned or ptotic submandibular glands, which can be masked by fat, should be noted.
- The presence of platysmal bands is evaluated easier if there is not much fat deposit on the neck and during animation.

11.8 Percutaneously Placed Suspension Sutures

A number of alternatives for facelift procedures have been develop to reduce downtime and cost. For the patient with primarily soft tissue ptosis and little skin redundancy, the use of suspension sutures is an option. Suspension threads are inserted percutaneously to elevate the brow, midface, and jowl areas (Teimourian 1989). It requires only local anaesthesia, minimal downtime, and low cost. It is not suitable for patients with redundant skin, but suitable only for young male patients. It is not a procedure for long-term correction.

There are many different thread types, which range form surgical suture threads to polypropylene sutures that utilize unidirectional-oriented barbs. The barbs are placed so that they spiral around the suture. These sutures are frequently fixed superiorly or are not fixed at all, counting on the fixation of the barbs in the soft tissue. The former is considered to present a long-lasting result. There is minimal scarring, and the reported complications include mild asymmetry, ecchymosis, erythema, bleeding, visible threads, swelling, and discomfort (Lycka et al. 2004; Monheit 2005).

Top 10 key pointers

- Majority of male patients are not seeking extensive surgery but rather a more focused, limited treatment plan. In addition, they fear the surgery and the use of general anaesthesia and are concerned about the cost of the procedure.
- Men do not have the means to camouflage the signs of surgeries effectively as women do. So, minimal invasive surgical procedures, such as the Microlift, are perfect for male patients.
- The major anatomical differences between male and female facelift patients involve the hair pattern, beard, and skin characteristics.
- Male patients should have a hairless area in the preauricular region. Hair bulbs can be removed with either scissors or cauterized by inverting the skin and working on the subcutaneous layer.
- The beard area should be carefully observed when adjusting the skin for resection.
- The progression of male pattern baldness must be considered in planning appropriate incisions and techniques.
- Men must be informed that they may have to shave behind the lower part of the ear because of upward displacement of bearded skin.
- The submental and neck lipoplasty for male patient is frequently requested because it offers the potential for remarkable improvement in the cervicomental angle with limited downtime.
- Suction lipoplasty was always more indicated for young patients with good skin tone. It has been expanded especially to male patients of 50–70 years old, with satisfactory results, as the localization of the fat was mainly in the midline and for those with skin of good tone.
- Be careful with male patients and sildenafil (Viagra®) and tadalafil (Cialis®). Some of them are frequent users and forget to inform it and withdraw it before surgery. The hematoma formed in the postoperative period may be severe.

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Complications: How to Avoid and Treat Undesired Results

12

Berthold Rzany

Basically two different types of complications can occur: (1) an undesirable result or (2) an adverse event.

12.1 Undesirable Result

What is an undesirable result? First: a result that the patient or the aesthetic physician do not like.

12.1.1 Misunderstanding Between the Patient and the Aesthetic Physician

In general, if the patient and the aesthetic physician agree that the result is not perfect and should be corrected, then there is not much that is left than to discuss the possible ways to improve the result. It is more difficult in case the patient sees room for an improvement and the aesthetic physician do not. Here is the first and important step for the aesthetic physician to try to understand the patient. There are patients similar to make up artists who see tiny things that even an aesthetic physician might have overlooked. In case the aesthetic physician can follow this patient, then there is no real problem.

12.1.2 Dysmorphia as a Base for Misunderstanding

There, however, might be a problem in the case where the assessments of the patient and the aesthetic physician are really divergent. In this case, one reason might be that a patient with dysmorphia had been treated (which in the first place should not be done). Those patients in general are very difficult or nearly impossible to be satisfied. In case, when dysmorphia is assumed, further invasive procedures are strongly discouraged.

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12.2 Avoidance of the Undesirable Result

How can this situation be avoided?

12.2.1 Patient Information and Informed Consent

Here it is very important to stress the significance of the first contact between the patient and the aesthetic physician. To avoid unsatisfied patients, the individual demands of the patient need to be ascertained. It is recommended to use a mirror or better a recent photograph of the patient to discuss therapeutic strategies. In addition, it is helpful to show realistic before and after photographs and also – if there is a downtime associated with the procedure as in deep peels or a CO_2 laser treatment – the in-between photographs. To invest time before the procedure will save time afterwards. In addition to the photographic documentation, the written consent of the patient to the procedure is strongly encouraged.

12.3 Adverse Event

The adverse events are procedure related. There are basically two types of adverse events: (1) due to overtreatment and (2) due to immunologically mediated procedures, which we only partially understand so far.

12.3.1 Overtreatment

With the use of botulinum toxin A, the paralysis of adjacent muscle groups can occur. One of the most known ones is the eyelid ptosis after the treatment of the glabella (see Chap. 8). This is also the only one where a quasi antidote – apraclonidine eye drops – are available. For other unwanted effects such as the eye brow ptosis, no antidote is available. Here, the only solution is to wait until the unwanted effect disappears. In general, a wait and see attitude is encouraged in the first 2 weeks after treatment with BoNT-A. Sometimes, especially when treating the lower face, an asymmetry might be only temporary until the full effect is present.

In injectable fillers, overtreatment may result in lumps or asymmetries (Fig. 12.1). If the lumps and asymmetries are caused by permanent fillers, treatment is usually difficult. Only for fillers based on hyaluronic acid, an antidote, hyaluronidase, exists. There are several types of hyaluronidase available. The European product from Dessau (Hylase Dessau, 1:150) needs to be diluted with saline according to the instructions. The hyaluronidase is injected in the area of hypercorrection with several injection points of 0.05–0.1 mL. Usually, the hypercorrection

Fig. 12.1 Unnatural correction with polyacrylamid (Aquamid®). Big lumps of material appears when the patient smiles.

disappears after 24–72 h (Soparkar et al. 2004; Brody 2005; Becker-Wegerich 2008). As overtreatment is more likely in less experienced users, it is recommended that novice users of injectable fillers start with a hyaluronic acid preparation before continuing to other fillers.

12.3.2 Real Adverse Events

With botulinum toxin A, relevant adverse events for aesthetic indications are quasi nonexistent. For injectable fillers, however, a variety of rare reactions can occur, which might require oral or injected glucocorticosteroids, antibiotics, or even immunmodulating drugs (Fig. 12.2a, b).

12.3.3 Avoidance of Adverse Events

Rare reactions can usually be not avoided. Although we do know a lot more than we did know before on these reactions, we still know only for a small subset of our patient's avoidable risk factors.

Fig. 12.2 (**a**) and (**b**) HIV and Hepatitis B positive patient with drug-induced lipoatrophy who developed hard nodules when treatment with interferon was started. The patient was treated several times before with polylactic acid. The nodules reflect probably sarcoid granulomas induced by interferon. In parallel, the patient developed a granulomatous reaction in a tattoo on his right arm.

12.4 The Doctor as a Risk Factor

When do we ourself become a risk factor? In case we overestimate our abilities. Every BoNT-A preparation, every filler, every peel, every laser, or IPL is different. Doctors should be aware of that and try to get the best expertise on the product or the procedure before using it. It might be much better to refer a patient to a specialist than to treat him with insufficient knowledge of the product or the procedure. In addition be careful with cheaper "me-too" products, for example, products that are proposed to be similar to the original one. Ask for clinical data before using them in your patients. Otherwise, you might end up with a product, for example, a hyaluronic acid preparation that claims to be similar to the market leaders, but might have an increased risk of abscess formation due to bacterial residues or chemicals used for grosslinking.

12.5 Dealing with Undesirable or Adverse Events

If you treat enough patients, undesirable results and adverse events will inevitably occur. To avoid unpleasant situations between the patient and the aesthetic physician, some ground rules should be followed.

The most important point is to be accessible. If something goes wrong or only appears to have gone wrong in the eye of the patient, the physician should be there for the patient. Even a busy schedule is no excuse for not seeing this patient. Just by seeing the patient, assessing the situation, and discussing the problem with the patient will ease potentially disastrous situation (Perrogon 2003; Blackburn and Blackburn 2008; Rhodes 2008).

When seeing the patient and assessing the situation, it is very important to be honest with yourself and the patient. If there is some foreign body granuloma reaction to a semi-permanent or permanent injectable filler, it is of not much use trying to find someone to blame (the company, the patient). It is much more important to find a solution for the problem of the patient. If you feel that your expertise is not sufficient, consult yourself with a specialist.

FAQs

What are the risk factors for granulomatous reactions to injectable fillers?
There are very few predefined risk factors. There are certain materials (as Dermalive® – a filler based on methacrylate) and certain patients (as patients requiring interferon therapy who are prone to sarkoid granulomas (Fig. 12.2a, b) who carry an increased risk (Zielke et al. 2008).

Is hyaluronidase helpful in patient with foreign body granulomas?
Usually not. Only if these reactions occur after a hyaluronic acid reaction and the substance is still present, hyaluronidase may be beneficial (Brody 2005; Becker-Wegerich 2008).

What is the best treatment for foreign body formation?
Even if you are a surgeon, be careful with the attempt of a surgical removal of these nodules. Asymmetry and scars may be the price. Unfortunately, there is no good data on the treatment of these reactions. Usually immunomodulatory regimens either by injection or per os are recommended. We would recommend asking the advice of a specialist before starting your own regimen.

Are there other adverse events that can be avoided?
There are a small number of vascular reactions in the glabellar area that may be avoided by injecting less filler in this area. The amount of filler needed in the glabellar areas can usually be decreased by pretreatment with BoNT-A.

Do's

- Offer your patients something in which you are good at. If you are not good at a certain intervention, try to learn it and meanwhile refer your patients to trustworthy colleagues.

Don'ts

- This is the most important thing: if something goes wrong be honest to the patient and yourself. Do not try to sweat talk things or delay necessary treatments.

12

Key pointers

- Be aware that every intervention will carry a certain risk with it.
- Communicate the risk with the patient, however, without scaring the patient.
- Document this talk with the patient in the chart.
- If something goes wrong, be accessible, try to help the patient as much as you can do.

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