FACIAL ARCHITECTURE

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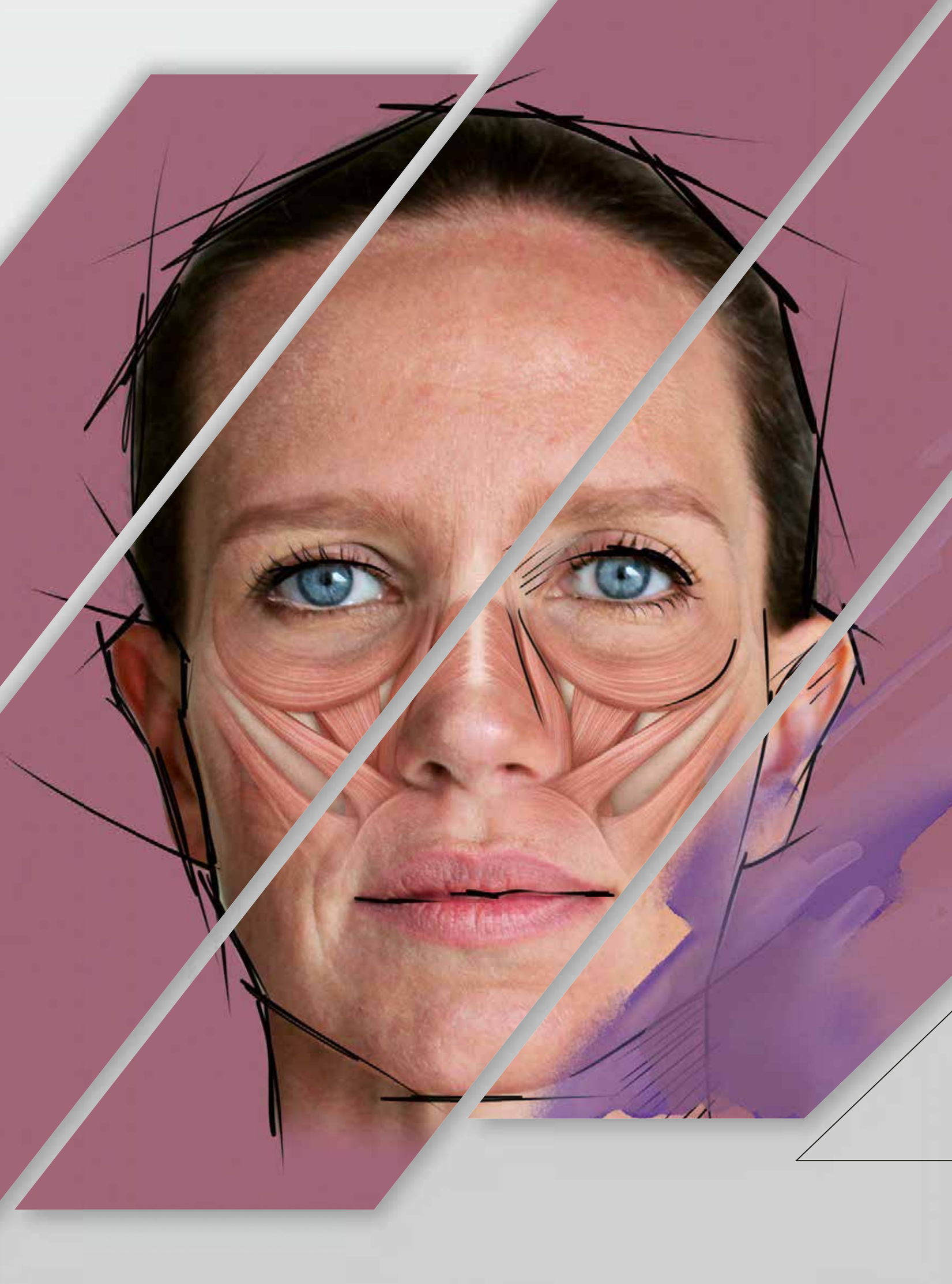
SUMMARY



FACE ANATOMY AND ATTACHED STRUCTURES

FACIAL ANATOMY APPLIED TO THE PRINCIPLES OF FACIAL HARMONIZATION AND THE USE OF INJECTABLES IN DENTISTRY

Knowledge of head and neck anatomy is the foundation of orofacial harmony and other therapeutic applications of injectables in Dentistry. Principles and parameters of harmony are established from this knowledge, and regions of interest for using these drugs in all anatomical areas are identified accordingly. Likewise, knowledge of anatomy, especially of contiguous structures of interest for injections and fillers, guides the techniques and ensures their safety and reproducibility.

When appropriate, the conventional approach to anatomy for surgical-restorative dental therapy of oral and dental problems will be quickly addressed. On the other hand, the muscles responsible for facial expression and regions such as the orbit and nasal cavity and adjacent structures will be explored in this part, emphasizing the therapeutic use of injectables in Dentistry. This chapter is aimed to revisit the anatomical structures of the face in the context of the techniques to be presented later in this book.

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01

As **Fig 1-1** demonstrates, the injection points are an example of the extent of the facial harmonization techniques. Facial screenings are generally performed from divisions that guide the techniques and will also be used in this chapter to organize the content to be presented. The two ways of dividing the face are shown in **Figs 1-2A,B.**

For detailed analysis of facial anatomy, we will use the vertical compartments of the face in this chapter.

- Upper face: from the initial line of the scalp to the glabella.
- Middle face: from the glabella to the subnasal point.
- Inferior face: from the subnasal point to the gnathion (or mentalis).

1-1. Example of botulinum toxin injection points.[38]

GENERAL PRINCIPLES OF ANALYSIS OF THE SUPERFICIAL ANATOMY OF THE FACE

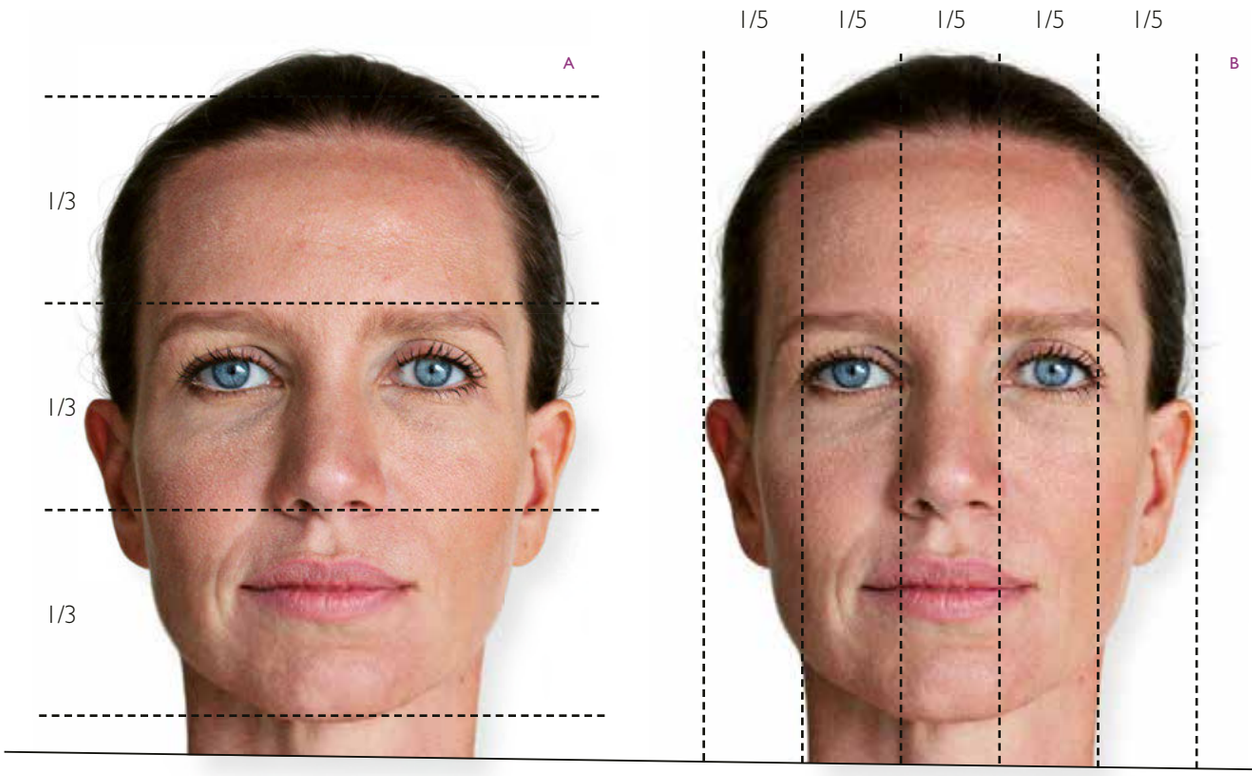
A harmonious face is essentially a proportional face. As **Figs 1-2A,B** illustrate, the analysis of facial harmony is largely based on the analysis of its surface, covered mainly by the skin. The most relevant principle to be observed is proportion. All therapeutic techniques used in harmonization aim to restore vertical and horizontal proportions, regardless of gender and ethnicity.

The vertical planes were previously presented together with **Figs 1-2A,B**. The limits of the vertical thirds must be equidistant, ensuring proportionality.

The same rationale applies to the horizontal fifths. The following landmarks delimit these regions: the most lateral fifths extend from the pinna points to the lateral canthion (or *exocanthion*), the central fifth is comprised between the central canthions (or *endocanthions*), and the remaining fifths are the palpebral fifths, which extend between the lateral to the central canthions. Another characteristic of the horizontal proportion is the coincidence of the intercantal distance with the wing base.

A face is also considered harmonic when quantitative equivalence exists between the vertical thirds and the horizontal fifths. Face shapes arise from the interrelationship between these regions. For example, a long face has, proportionally, facial thirds longer than facial fifths.[12]

Another principle to be observed in the face is the fluidity of its contours, which must be smooth and continuous. For example, the upper eyelid arch should have a smooth transition to the side of the nose. Likewise, the upper eyelid is incorporated into the midface in a profile view.[12]



I-2. A,B – Division of the face horizontally into three thirds. For facial harmony, the thirds must follow a symmetry **(A)**. Division of the face vertically into five equal parts **(B)**.[12]

REGIONAL PRINCIPLES OF ANALYSIS OF THE SUPERFICIAL ANATOMY OF THE FACE

TOP FACE

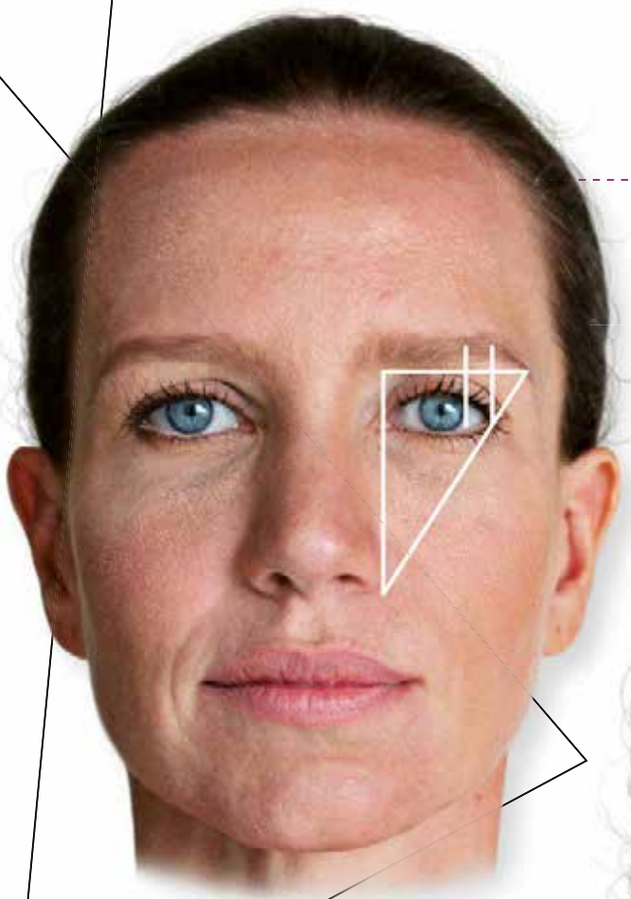
Forhead

The migration of the scalp line over time, especially in men, is the biggest challenge in this region. This shift can lead to changes in the proportionality of the vertical thirds of the face. This change is corrected with plastic surgery techniques, using the "head curvature rule".[34,39]

The convexity and slope of the forehead play a significant role in the appearance of height in this region. An individual with a flat or protruding forehead appears to have a short forehead compared to an individual with a forehead that has a curved forehead with a greater posterior slope. Ideally, the forehead should also be slightly convex from the top of the head to the eyebrow, with the glabella as the most prominent structure anteriorly. This prominence of the glabella is more pronounced in men.[12]

Periorbicular Region

The upper limit of this region is delimited by the eyebrow. This structure is described[19] as having its beginning coinciding with the extension of a vertical line that runs from the angle of the wing of the nose to the medial canthion, ending laterally in the extension of a line that runs from the angle of the wing of the nose to the lateral canthion. The eyebrow peak is between the lateral limbus and the lateral canthion **(Fig I-3)**. In men, this peak is less pronounced than in women.[27] The eyes must be analyzed considering current ethnic variations and geographic trends regarding what is harmonic or esthetic. However, this area must be evaluated before any procedure to avoid post-therapeutic complications, a topic that will be described in greater detail later in this chapter. Changes in visual acuity, the field of vision, eye irritation, and dryness should be considered before and after procedures near this region.[12]



1-3. The brow peak is between the lateral limbis and the lateral canthion.[12]

1-5. Attributes of a young face versus an aged face. This shows malar fat ptosis in the transition from a young heart-shaped face to an aged pear-shaped face.[7]

1-4. In youth, the esthetic eye has the lateral canthion positioned 1 to 2 mm above the medial canthion, giving the eye a subtle lateral tilt.

In youth, the esthetic eye has the lateral canthion positioned 1 to 2 mm above the medial canthion, giving the eye a subtle lateral inclination[27] **(Fig 1-4)**. The typical height of the palpebral fissure is 9 to 12 mm, with a horizontal width of 28 to 30 mm. During aging, this width decreases by around 10%.[42]

The upper eyelid should be evaluated in conjunction with the position of the eyebrow. The margin of this eyelid lies between the corneal limbus and the iris boundary or approximately 2 mm below the corneal limbus. Likewise, the volume of this eyelid must be observed. The young upper eyelid has a convex appearance due to its natural filling. With aging, this eyelid becomes flattered and even concave.[14]

The lower eyelid should be evaluated with respect to the quality and quantity of skin present. With aging, this region is also prone to wrinkles. The behavior of this structure in facial movements, especially when smiling, must be observed.[12]

The lower eyelid should be analyzed in conjunction with the middle face, with which it should have a smooth transition. In a profile view, the lower eyelid is a single convexity that extends with age and becomes biconvex.[2] As with the upper eyelid, the volume of the lower eyelid must be analyzed for excess or lack of volume.

Middle Face

The harmonic middle face presents an ascending and divergent aspect toward the upper face, a consequence of the positioning of the adipose component of this region and the bilateral convexity existing in this third of the face toward the auricular region. With aging, this region takes on a descending appearance due to the force of gravity, with an apparent lengthening of the lower eyelid and accentuation of the lower orbital rim. Accumulations of adipose tissue also appear in this region, specifically in the subocular and malar regions. These accumulations accentuate the nasojugal groove and the nasofacial fold.[12] Another anatomical characteristic contrary to the harmonious face, but not related to aging, is masseter hypertrophy. It gives a lower prominence to the zygomatic arch, giving the face more straight and abrupt angles.[46]

In young patients, the cheek region has volume, presenting curvature and a malar prominence covered by a layer of adipose tissue. The middle face has the shape of a heart **(Fig 1-5)**, whose vertex is found on the chin and prominences that cover the zygomatic arch, extending to the inferolateral region of the orbit.[7]

Bottom Face

The lips are the structure that requires further analysis in this region. They should include a visible transition of lip vermilion through a line or margin, a V-shaped cupid's bow, a medium tubercle and vermilion with volume, an ascending line at the commissure, and a close upper to lower lip ratio of 1:1.5.[11]

The chin region and jawline should be oval and delicate in women, with straighter angulations, and a heavy and robust appearance in men. For all genders, a good projection of the chin and an ascending jawline from the chin are harmonic characteristics.[11]

As mentioned earlier in this section, the aging process is primarily responsible for changes in the surface anatomy of the face, giving it an inharmonious appearance. A summary of these changes can be found in **Table 1-1**.

Layers common to the soft tissues of the face

The region of action of facial injection techniques has up to five anatomically distinct layers. The following is a brief description of these layers, from the external surface to the bone surface.[9]

Layer 1: **the skin** of the face has variations in thickness, pigmentation, and subcutaneous adhesion between different areas. Distinct regions of the face have skin connected by avascularized septum to the subcutaneous fat layer, as in the buccal and parotideomasseteric regions.

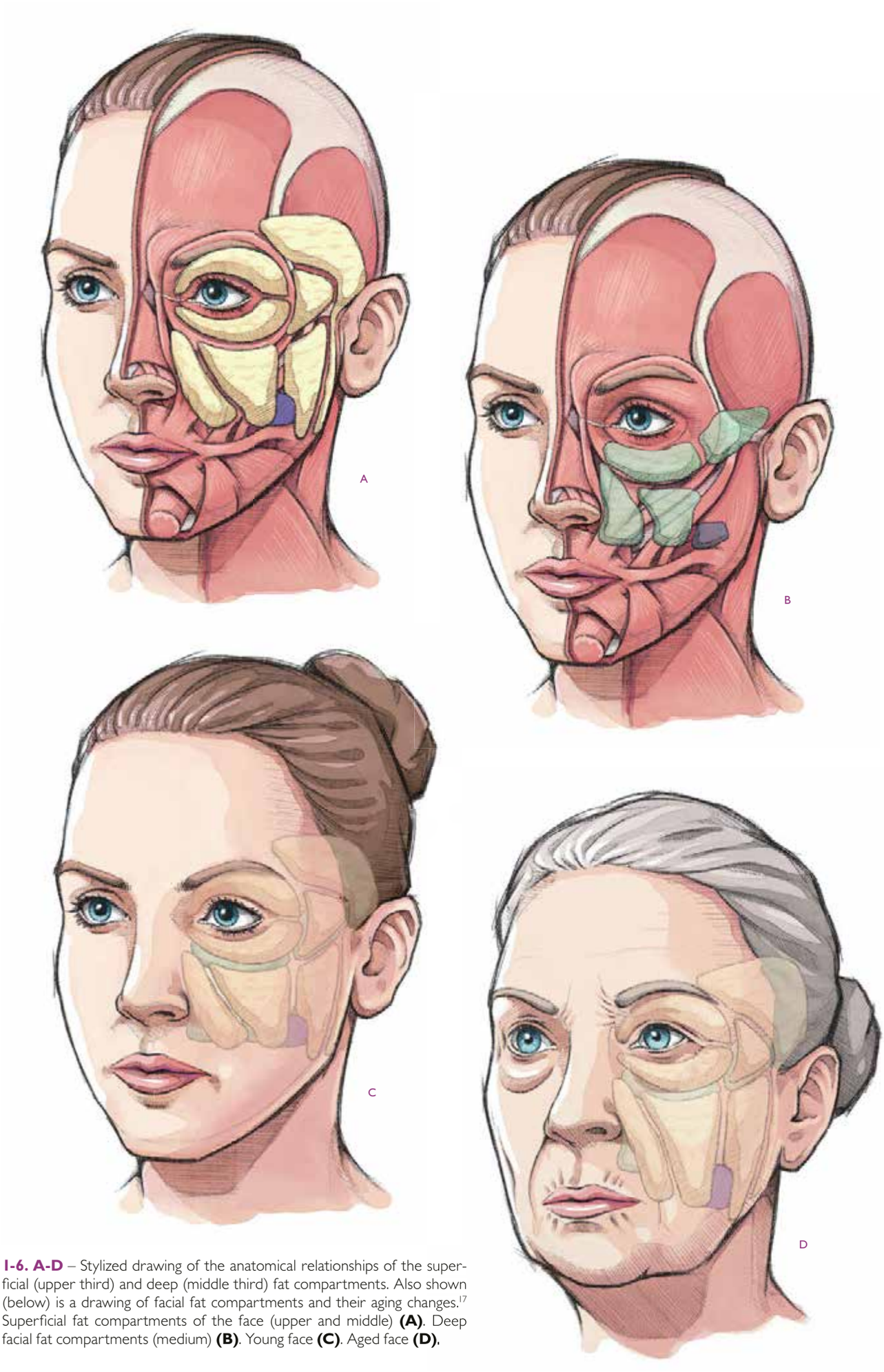
REGION	STRUCTURE	CHANGE WITH AGE
TEMPLE	Superficial fat	Gets thinner in men and women
	Bones	Decreased bitemporal width
EYEBROW	Fat	The galea layer increases in women, not in men
	Muscles	Loss in women, not men
	Total soft tissue	Small increase in men, not women
	Bone (superior orbital rim)	Increased supramedial opening, greater in women Decreased glabellar angle
UPPER EYELID	Total soft tissue	Volume loss
ORBIT	Eyeball	No change of position with respect to orbit ceiling or floor
	Orbital opening	Increased orbital width and aperture area
LOWER EYELID	Orbicular fibers	Decreased thickness
	Fat	No changes with respect to the cornea
		Hernia formation relative to the zygoma, the orbital wall, inferior orbital rim, and globe axis Increased orbital fat volume
	Bone (inferior orbital rim)	Corneal-related retrusion, greater in men. No changes in the orbital floor relative to the apex of the orbit Increased infralateral opening
NASOJUGAL SULCUS	Skin	Stable upright position as you age
	Soft tissue	Loss of volume, thinning
NASOLABIAL FOLD	Skin	Stable upright position as you age
	Surface fat	Hypertrophy with inferior redistribution Thinning
	Mimetic muscles	No changes
	Deep fat	Thinning Sagging
ZYGOMATIC REGION	Fat	No changes
	Bone (maxilla)	Regression/clockwise rotation Expansion from the sphenoid Shortening
UPPER LIP	Skin	Thinning
	Total soft tissue	Thinning at vermilion border and middle lip No changes in cross section (thinning + stretching)
	Fat	Thickness increase
	Orbicular fibers	Thinning and flattening (from buccal to labial)
BOTTOM LIP	Total soft tissue	Volume loss
CHIN LINE	Bone (mandibular)	Decreased body height, branch height, body length Increase in the angle of the jaw

Table 1-1.

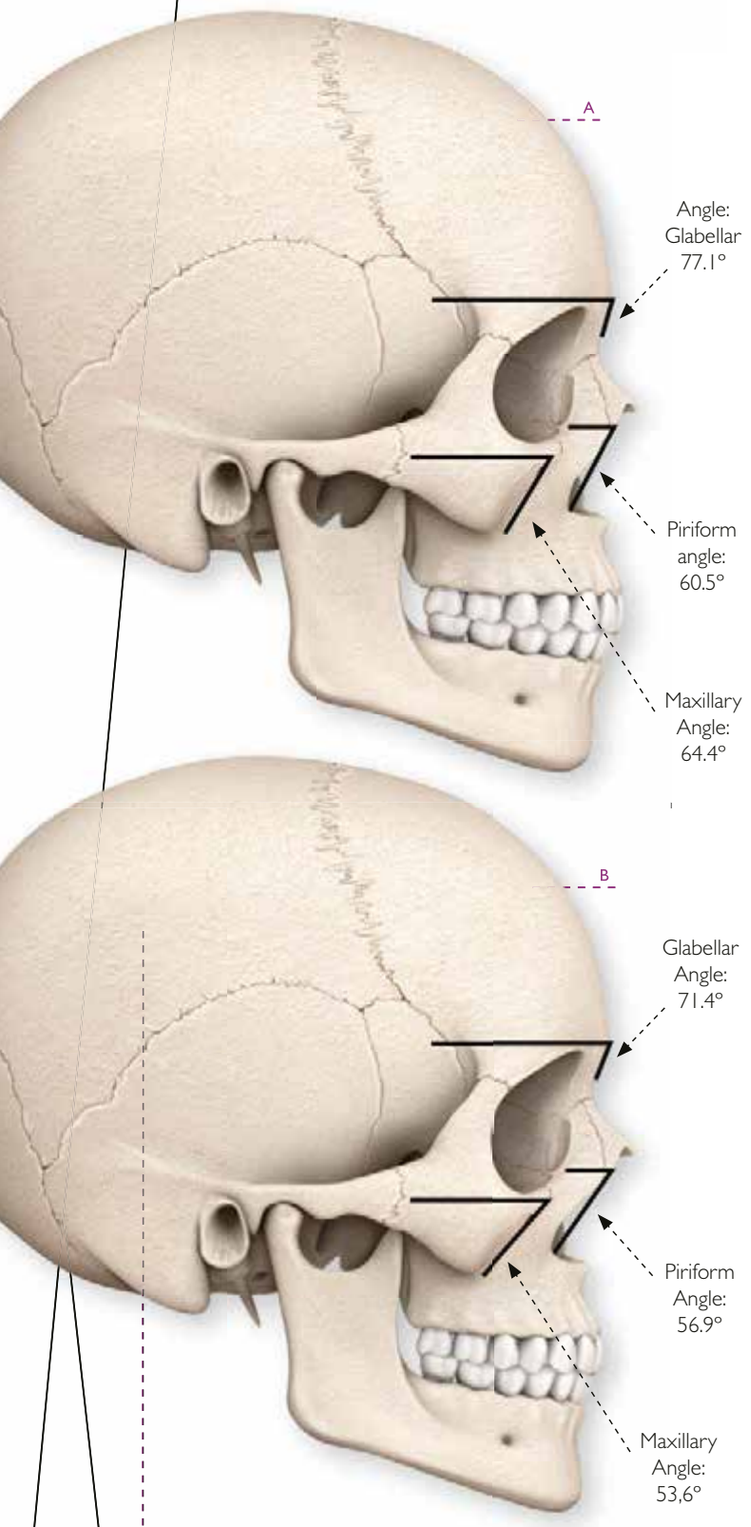
In other regions, such as the infraorbital region and the region medial to the interpupillary line, the skin is thin and usually lacks adipose tissue. Most regions of the mimetic and orbicular muscles have skin firmly attached to these muscles.[9]

Layer 2: **the subcutaneous tissue** of the face is highly vascularized and compartmentalized by fibrous septa. Within these septa, small vessels are identified. These septa are related to the mimetic muscles of the face. It is in this layer that the superficial adipose tissue is found. This tissue presents a great anatomical variation concerning the mimetic muscles, making it difficult to precisely establish the limits of these adipose bodies on the face.[9]

In view of these difficulties, the location of the face's superficial and deep fat pads and their change with aging is shown in **Figs 1-6A–D.**[16]



I-6. A-D – Stylized drawing of the anatomical relationships of the superficial (upper third) and deep (middle third) fat compartments. Also shown (below) is a drawing of facial fat compartments and their aging changes.[17] Superficial fat compartments of the face (upper and middle) **(A)**. Deep facial fat compartments (medium) **(B)**. Young face **(C)**. Aged face **(D)**.



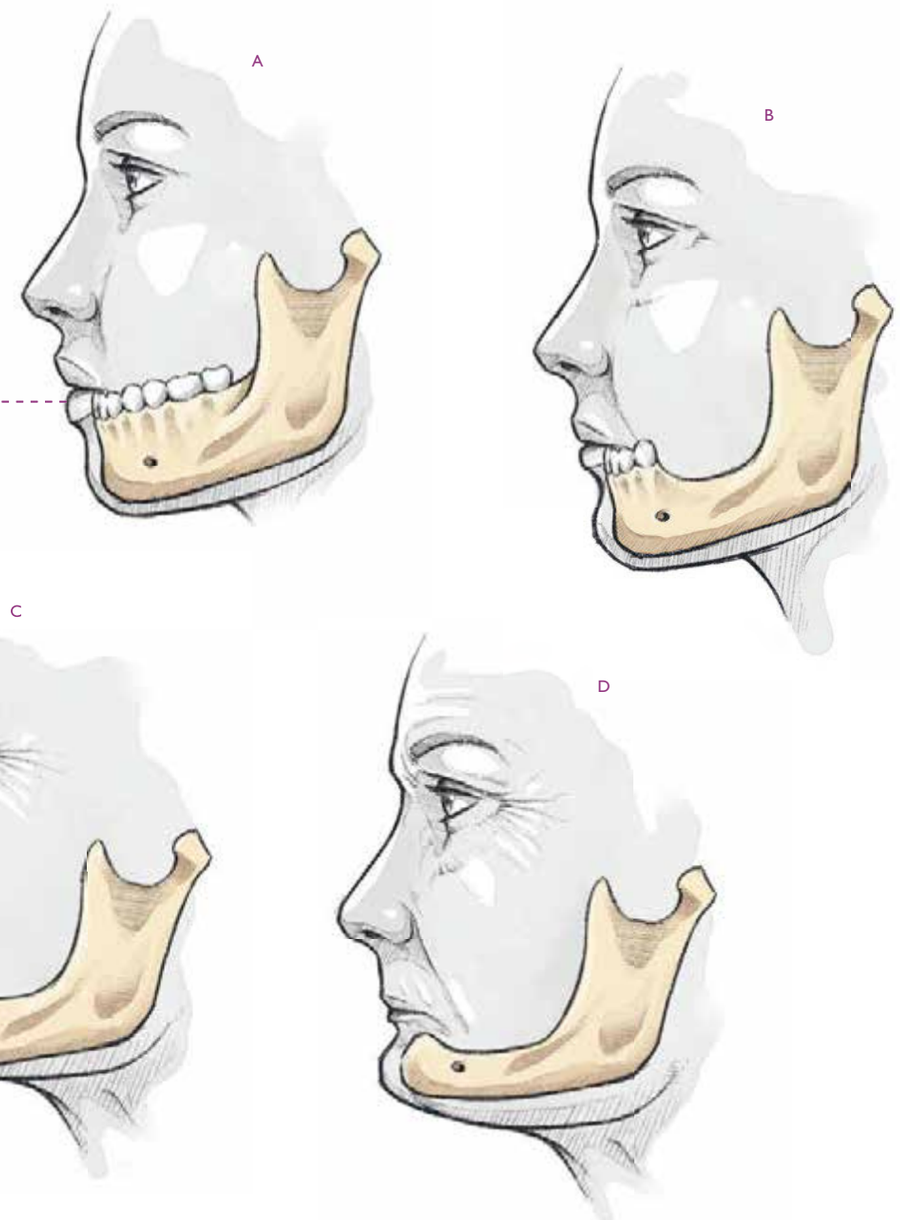
3-4. A,B – Glabellar, piriformis, and maxillary angles in the young **(B)** and aged **(A)** profile. Source: Pessa.[33]

These three points describe a line with a slightly upward direction. In the older profile, the piriformis process remodels posteriorly and superiorly, distorting the normal soft tissue relationship of the young nasal complex **(Fig 3-3B)**. The alar base is now over the columella, which is in line with the nasal tip. Notably, the piriformis and maxillary angles decrease significantly with aging **(Figs 3-4A,B)**.

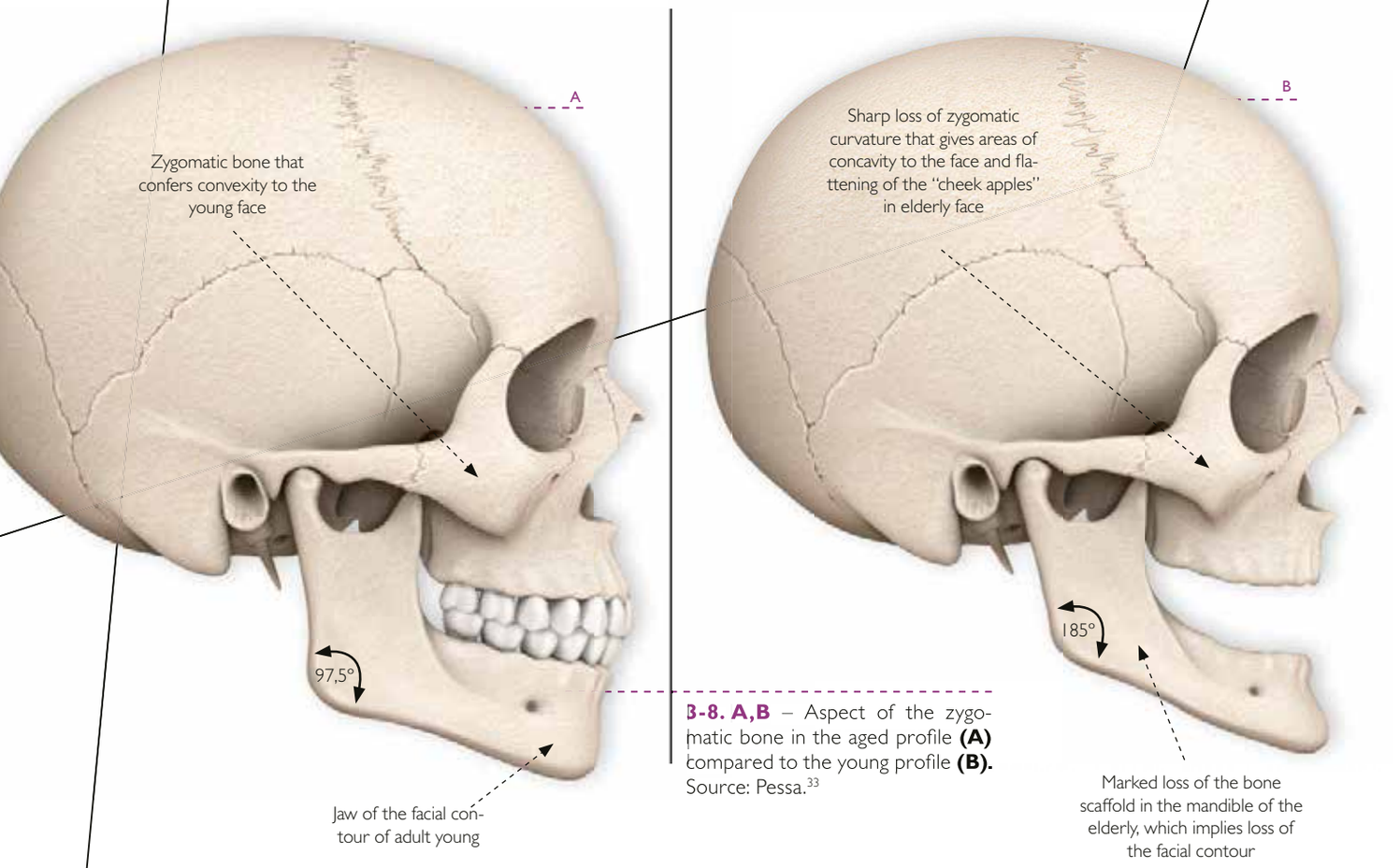
In addition, the superomedial and inferolateral portions of the orbit present a greater tendency for resorption, resulting in increased prominence of the medial fat pad, the elevation of the medial eyebrow, and elongation of the eyelid-cheek junction **(Fig 3-5)**. Also, as previously stated, the body of the mandible undergoes a progressive flattening since, although mandibular growth continues throughout life, the mandibular border has a differentiated growth from the mandibular body, resulting in the flattening of the curve of the face, generating a less youthful appearance **(Figs 3-6A,B and 3-7A–D)**.

3-5. Resorption in the superomedial and inferolateral portions of the orbit in the aged face (right) compared to the young face (left). Source: Mendelson and Wong.[25]

3-6. A,B – Progressive mandibular flattening in the aged face **(B)** compared to the young face **(A)**. Source: Pessa.[33]



3-7. A-D – Progressive flattening of the face over the years because of loss of bone support.



3-8. A,B – Aspect of the zygomatic bone in the aged profile **(A)** compared to the young profile **(B).** Source: Pessa.[33]

In addition, there is a marked loss of curvature of the zygomatic bone, which gives areas of concavity to the young face **(Figs 3-8A–D)**.

CHANGE IN SOFT TISSUE – FAT

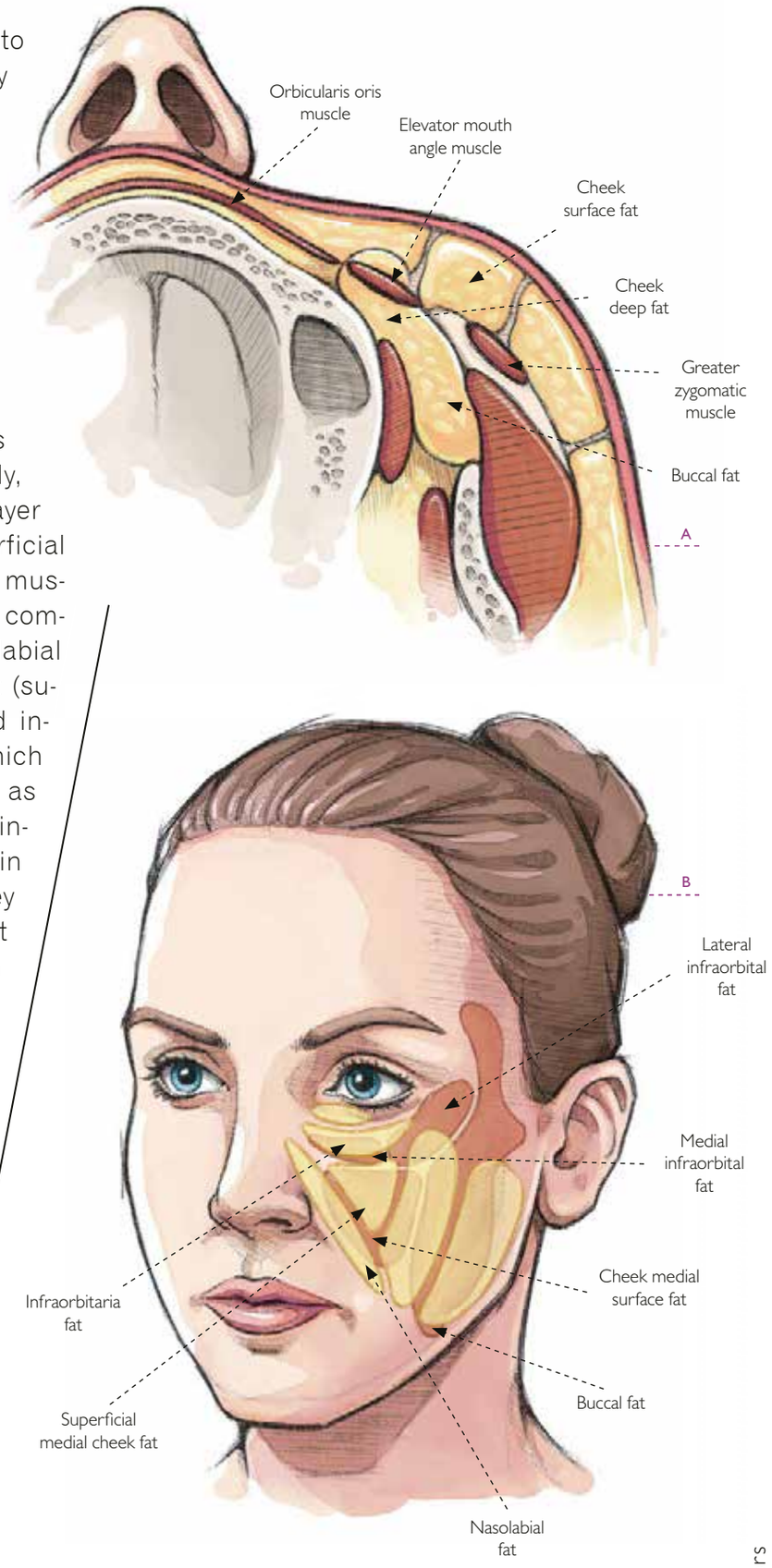
Two main theories characterize the changes in soft tissues observed in the average aging of the face: the gravitational theory (associated with changes in the ligamentous system of the cheek) and the volumetric theory (based on the fat compartments of the face).[47] These two theories are not mutually exclusive, and facial aging likely reflects a complex morphological change that involves elements of gravitational ptosis and volume deflation.

The gravitational theory is a more traditional concept that originated earlier in facial aging research. This theory proposes that age-related elastosis and attenuation of the cheek ligaments, which anchor the dermis to the underlying fibro-osseous structures, trigger the descent of the facial soft tissue, resulting in the flaccid appearance and deep grooves present in the aged face.[45] Furthermore, it is suggested that the repeated animation of the facial mimetic muscles, as in the smile, also contributes to this ligamentous attenuation.[14,29,45]

However, in the last two decades, there has been a shift from the exclusively descriptive gravitational theory to more recent discussions of the volumetric theory based on the fat compartments of the face. In 2000, Donofrio[8] drew attention to the compartmentalization of the clinically aged face, created by the juxtaposition of hypertrophic and atrophic "hills," such as "valleys," suggesting that, instead of gravitational descent, there is a loss of relative volume with gain in the neighboring regions of the face creating the deep age creases. Lambros[21] suggested that the fibrous network of the face is relatively immobilized, reiterating Donofrio's proposition[8] that the change in the face's morphology may not be entirely due to gravitational action but also due to the relative deflation of the facial fat compartments. In his analysis of 130 subjects, each photographed at two moments, ranging from 10 to 56 years apart, he observed that some facial marks do not change over time. At the same time, Rohrich et al[35–39] launched a series

of anatomical studies, which attested to the facial fat compartments defined by Donofrio[8] and Lambros,[21] gaining even more strength for the volumetric theory of facial aging.

These anatomical studies have shown that facial fat is not simply a confluent mass but is composed of highly divided fat compartments.[18] In addition, regional metabolic differences between these compartments may contribute to the morphological changes observed in the aged face.[46] Traditionally, facial fat is divided into a superficial layer and a deep layer concerning the superficial musculoaponeurotic system or facial muscle. From the midface, the superficial compartments include nasolabial fat (nasolabial fat – NLF), superficial medial cheek fat (superficial medial cheek fat – SMC), and infraorbital fat (infraorbital fat – IOF), which have also been collectively referred to as malar fat.[17,30,37] The deep compartments include the deep medial cheek (DMC) fat in the Levator labii superioris muscle. They also include infraorbital adipose body fat (Suborbicularis oculi fat – SOOF), which lies deep in the orbicularis muscle in the lower eyelid and is divided into medial and lateral parts. The medial part is located deep and medial to the NLF, and its posterior limit is the Ristow space. The lateral part is deep in the SMC **(Figs 3-9A,B)**.



3-9. A,B – Anatomy diagrams of facial adipose tissue.

The muscles of the face are numerous but slender compared to other muscles in the body and closely associated with the scalp and skin of the face and neck. These muscles attach to bone tissue and the deep layer of the skin, promoting the movement of the skin and scalp and enabling facial expressions. Expressions result from the combined actions of several muscles; thus, the same muscle can interfere with expressing different emotional states.[2] Therefore, besides anatomical knowledge, it is essential to have good esthetic sense and precision in the dose used during treatment to maintain natural facial expressions.

The face is didactically divided into three regions or thirds: the upper, middle, and lower. The upper is the region that goes from the hair root to the eyebrow line; the middle one is limited by the subnasal line, encompassing the eyes, nose, cheeks, and ears; and the lower one goes from the subnasal line to the chin **(Figs 9-1A,B)**. We will cover in this chapter the application of toxins in the upper and middle thirds.

The muscles of the upper and middle thirds are: frontalis, orbicularis oculi (palpebral portion), nasal and corrugator supercilii, levator labii superioris, levator labii superioris and wing of the nose, nasal, zygomaticus major, and zygomaticus minor (see images in Chapter 1).

Treatment with botulinum toxin in the upper third of the face is applied to wrinkles present in the glabella (procerus and corrugator of the eyebrow), orbicularis oculi, and frontal regions. Initially, we take the patient's anamnesis and ask what the expectations are with the treatment to clarify the objective of each toxin application point. We advise the patient if the treatment does not fully meet their expectations. A qualitative study with 30 patients shows that more than 80% of those who received botulinum toxin applications to treat wrinkles on the face say that the treat-

9-1. A,B – Regions or thirds of the face.

ment was beneficial and recommend the same. Only a small part of patients treated with toxin report discomfort during or after applications.[6]

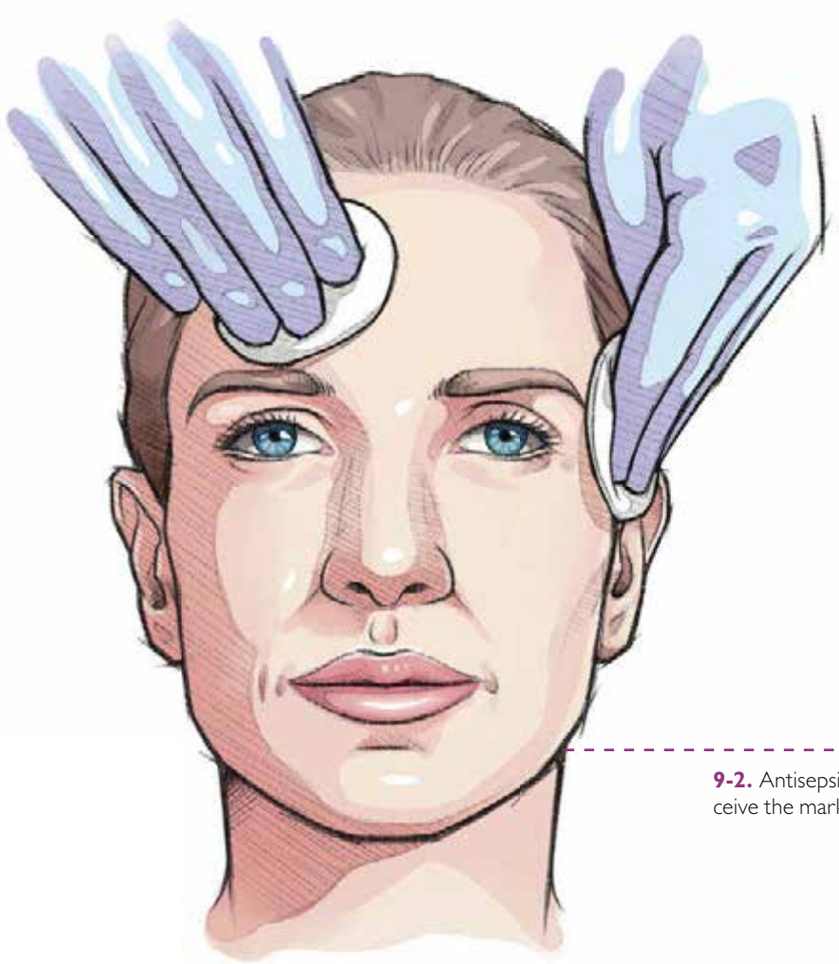
For a complete record, we recommend photographing the patient at rest and in forced mime, in which case we ask them to make the expressions "angry face," "astonishment face," "forced smile," etc. In this way, we record the patient at rest and in movement, laterally and frontally. We evaluated the area to be applied with the patient seated at rest and in the contraction of the facial muscles to make the markings, but we performed the applications with the face at rest. Before applying the toxin, we perform antisepsis with 2% chlorhexidine and apply a topical anesthetic (anesthetic ointment) for 40 min; if the patient is susceptible (he will be waiting for the effect of the anesthetic ointment at the reception of your office); if the patient is not very sensitive to pain, ice, or vibrating devices (vibrato) may be used to alleviate discomfort. We slowly apply the toxin and light compression if it starts to bleed at the point of application. We also use cold compresses if a hematoma forms in the applied region. We will detail below the toxin markings and units by application area using US units.

TREATMENT OF THE UPPER THIRD OF THE FACE

Smoothing wrinkles in the region of the glabella (procerus muscle and corrugator of the eyebrow), frontal, and orbicularis oculi.

MARKING THE MUSCLE AREAS

Firstly, the patient should be guided about his pain threshold and the burning sensation while applying the toxin. Some patients feel the needle, while others do not. We started with antisepsis throughout the application region **(Fig 9-2)**. Markings should be made with the patient seated or slightly inclined (45 degrees) so as not to mask dynamic wrinkles.

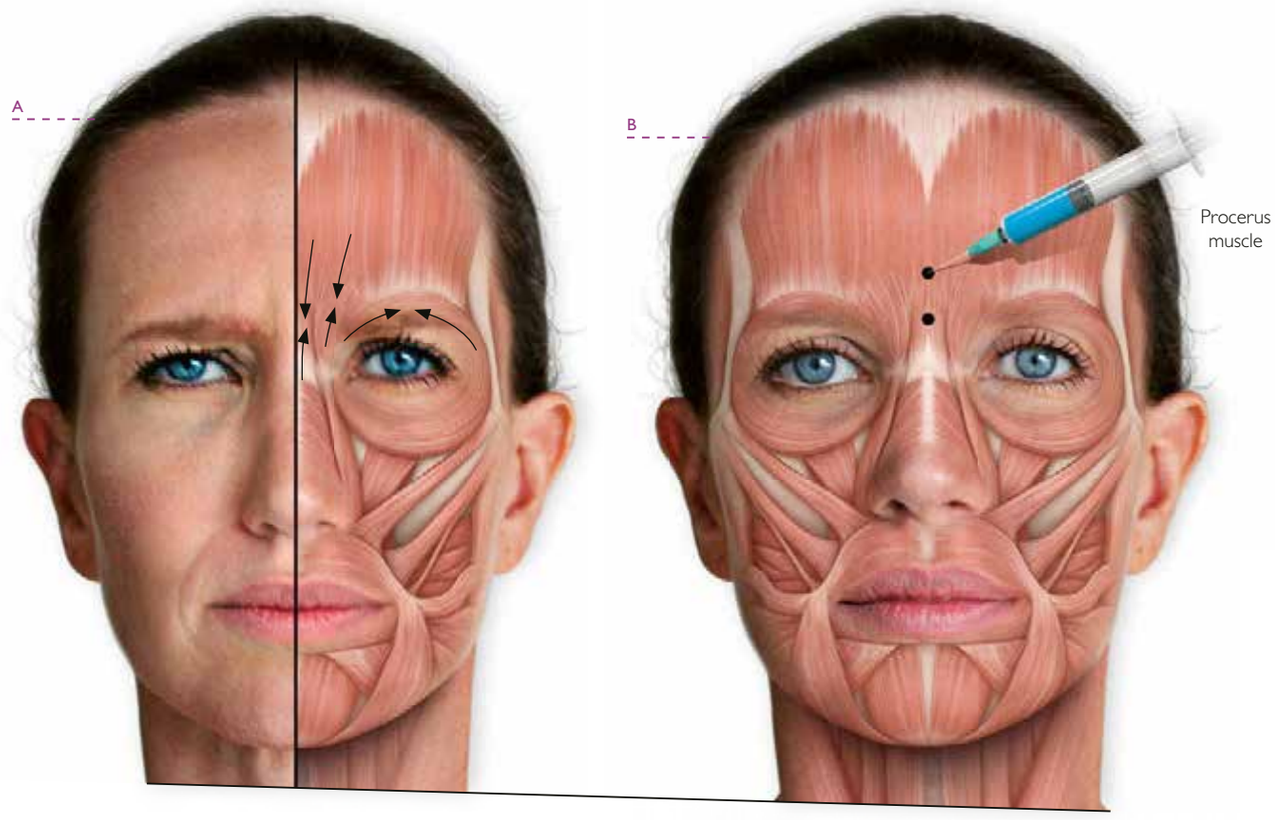


9-2. Antisepsis of the region that will receive the markings and toxin applications.

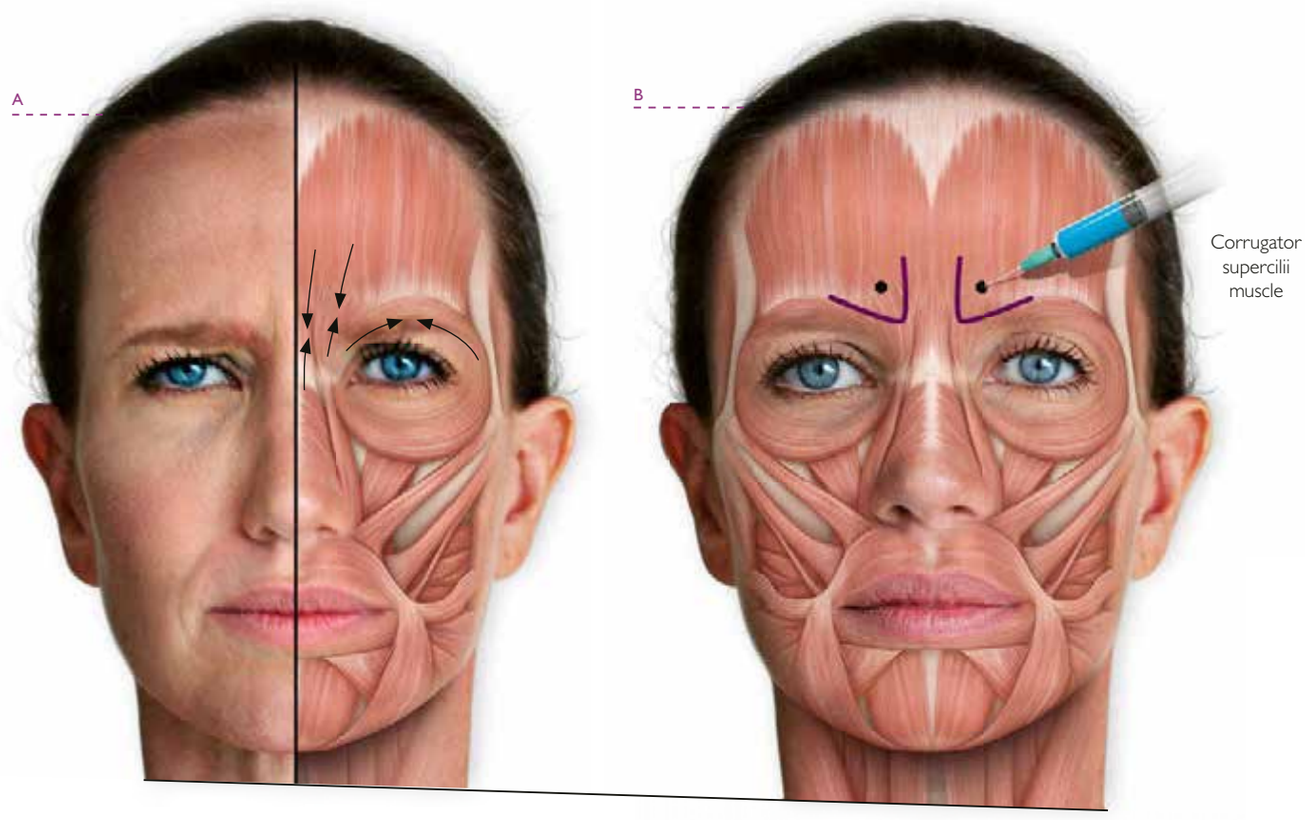
WRINKLES IN THE GLABELLA REGION

We marked the regions of the procerus muscle and the corrugators of the eyebrow for the application of toxins in the region of the glabella. To mark the procerus, we asked the patient to make an "angry face" **(Fig 9-3A)**, contracting the muscles of the face, but we performed the markings with the face at rest. We evaluate the contraction pattern of the region, and if we observe the contraction in the omega pattern, forming two furrows close to the eyebrows **(Fig 9-3A)**, we mark a point at the center of the procerus and two points at the end of the grooves **(Fig 9-6A)**, or we can score two single points in the procerus **(Figs 9-3B and 9-6B)**. To mark the eyebrow corrugator, we must palpate the muscle and mark a point in the thickest region above the eyebrow **(Figs 9-3C,D)**. If we consider the letter "V," this point would be the vertex **(Figs 9-3D,E)**. We make the markings on this muscle bilaterally.

9-3. A-E – Marking of the glabella region (procerus muscle and eyebrow corrugators). The patient was in an "angry face" mime, and we observed the contraction pattern in omega **(A)**. We mark two points on the procerus **(B)**. Palpation of the corrugator muscle **(C)**. Vertex of the "V" and marking the corrugator muscles' points **(D)**. Application of botulinum toxin in points **(E)**.



9-4. A,B – Omega pattern of contraction: two points of 5 U each in the procerus.



9-5. A,B – Point on the corrugator of the eyebrow bilaterally: 5 U for each point.

The local intramuscular application of the BTX-A dilution is followed by rapid diffusion in the interstitial space, depositing it specifically in the motor nerve endings of the skeletal muscles, which leads to a decrease in muscle contraction and, consequently, to a decrease in pain.[11] Studies show that the toxin acts both in the treatment of peripheral (local) and central (inhibition of trigeminal nerve sensitization) sensitization. Injection of BTX-A into the pericranial muscles blocks the release of neuropeptides (substance P, CGRP) and neurotransmitters (glutamate) from trigeminal peripheral sensory nerve endings. A still controversial hypothesis suggests that, despite having a significant molecular weight (150,000 Daltons), BTX-A can be transported through the axon cytoplasm, being transferred to second order nociceptive neurons (already at the central level) via retrograde axonal transport and transcytosis, where it would also prevent the release of pain neurotransmitters.[8]

Although botulinum toxin can selectively weaken the musculature, its therapeutic effect has a limited duration due to the formation of new acetylcholine receptors, promoting a reestablishment of neuromuscular transmission and a gradual return to muscle function.[3] The toxin needs 24 to 72 hours to take effect. Muscle paralysis starts between 2 to 5 days after the injection, with a peak of action in approximately 10 days, and lasts 2 to 3 months before starting its progressive and complete recovery, which occurs in a period of 3 to 6 months, depending on the condition and particularities of each patient. Therefore, a minimum interval of 3 months between applications is recommended.[13,27]

BOTULINUM TOXIN AND TMD

According to the American Academy of Orofacial Pain (AAOP), TMD is a collective term that defines a set of clinical symptoms that encompass the masticatory muscles, the temporomandibular joint (TMJ), and other musculoskeletal structures of the head and neck. These signs and symptoms include pain in the involved structures, limitation or deviation in mandibular movement, and joint sounds during function.[4] TMDs can have a muscular and/or joint origin.[35]

Muscular dysfunctions of the masticatory muscles are the most common complaint of patients with TMD.[32] Muscle pain (myalgia) can range from mild sensitivity to extreme discomfort and is associated with the presence of fatigue and muscle tension in the affected region. A reduction in the range of mandibular movements can also be observed.[31] One of its subtypes is myofascial pain, which is characterized by a state of chronic regional musculoskeletal pain, with specific signs and symptoms, such as the presence of myofascial trigger points that, when palpated or stimulated, refer pain to other regions, such as the head, eyes, and neck. The diagnosis is always based on clinical history, pain characteristics, and masticatory muscle palpation tests, which should reproduce the patient's complaint. For manual palpation, a firm digital pressure of 1 kg on extraoral muscles and 0.5 kg on intraoral muscles is recommended.[14,31]

Regarding the treatment of muscle disorders,[40] conservative modalities such as counseling, myorelaxant occlusal splints, injection and/or needling of trigger points, drugs, acupuncture, cognitive-behavioral therapy, and physical therapy modalities such as transcutaneous electrical neurostimulation (TENS) are common, ultrasound, and laser therapy. Therapy with BTX-A is considered minimally invasive; it has some significant advantages such as ease of application, relatively long duration of effect, and the expected precise relief at the pain site,[18] in addition to the reduction in the use of adjunct medications to control pain.[11] BTX-A can also be injected into trigger points instead of anesthetic substances.[2]

Regarding the effectiveness of BTX-A in the treatment of persistent muscle pain, studies are still inconclusive since the patient samples used are usually small and, in most cases, the injections are applied to patients with pain that is refractory to conventional treatments, which can cause bias in the results.[29] When compar-

ing the results of BTX-A injection with saline injections (placebo), there was no significant difference in pain intensity.[16] A review of the literature showed that three randomized clinical trials showed superior efficacy of BTX-A compared to placebo (saline injection) in the control of masticatory myalgia.[36] Recently, BTX-A therapy has provided significant relief for approximately one-third of patients with refractory masticatory muscle pain, with a slight risk of adverse effects.[21] Toxin injection does not guarantee complete resolution of myofascial pain, but it seems to have a beneficial effect on symptom improvement and can be considered when conventional methods fail.[39]

RECOMMENDED PROTOCOL FOR DTM

TMD – MUSCLES INVOLVED

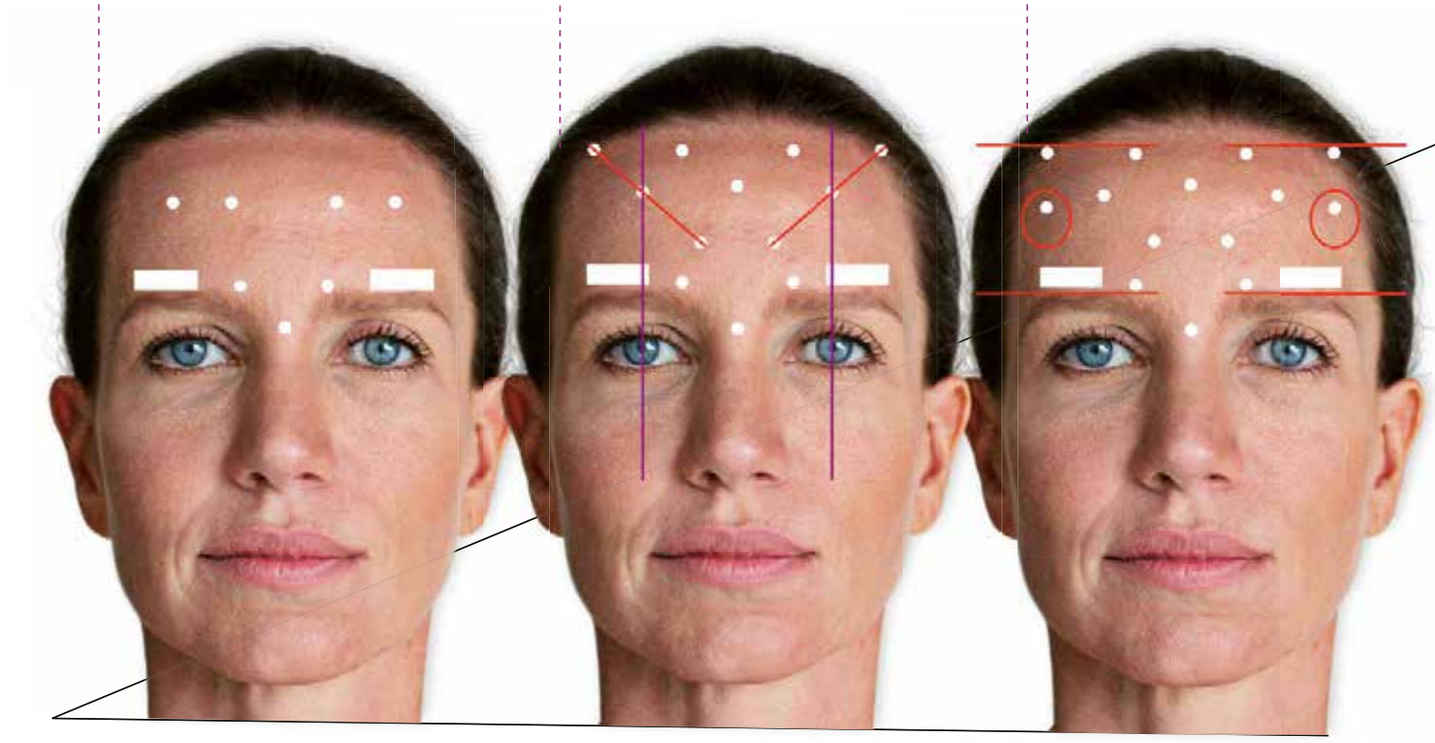
- Procerus and Corrugator.
- Front.
- Temporal.
- Masseter.
- Occipital.
- Trapezius and splenium of the head.

As can be seen, in the frontal muscle, it is possible to opt for the esthetic protocol **(Figs 10-2 and 10-3)** (for more information, see Chapter 9A) or define only the application of four points of 5U **(Fig 10-1)**.

10-1. Application points on the procerus (5 U), on the corrugators of the brow (5 U each), and on the frontal with four points of 5 U each.

10-2. Application points on the procerus (5 U), on the eyebrow corrugators (5 U each), and on the frontal with up to 25 U corresponding to the esthetic dosage. In the image below, the brow lift protocol.

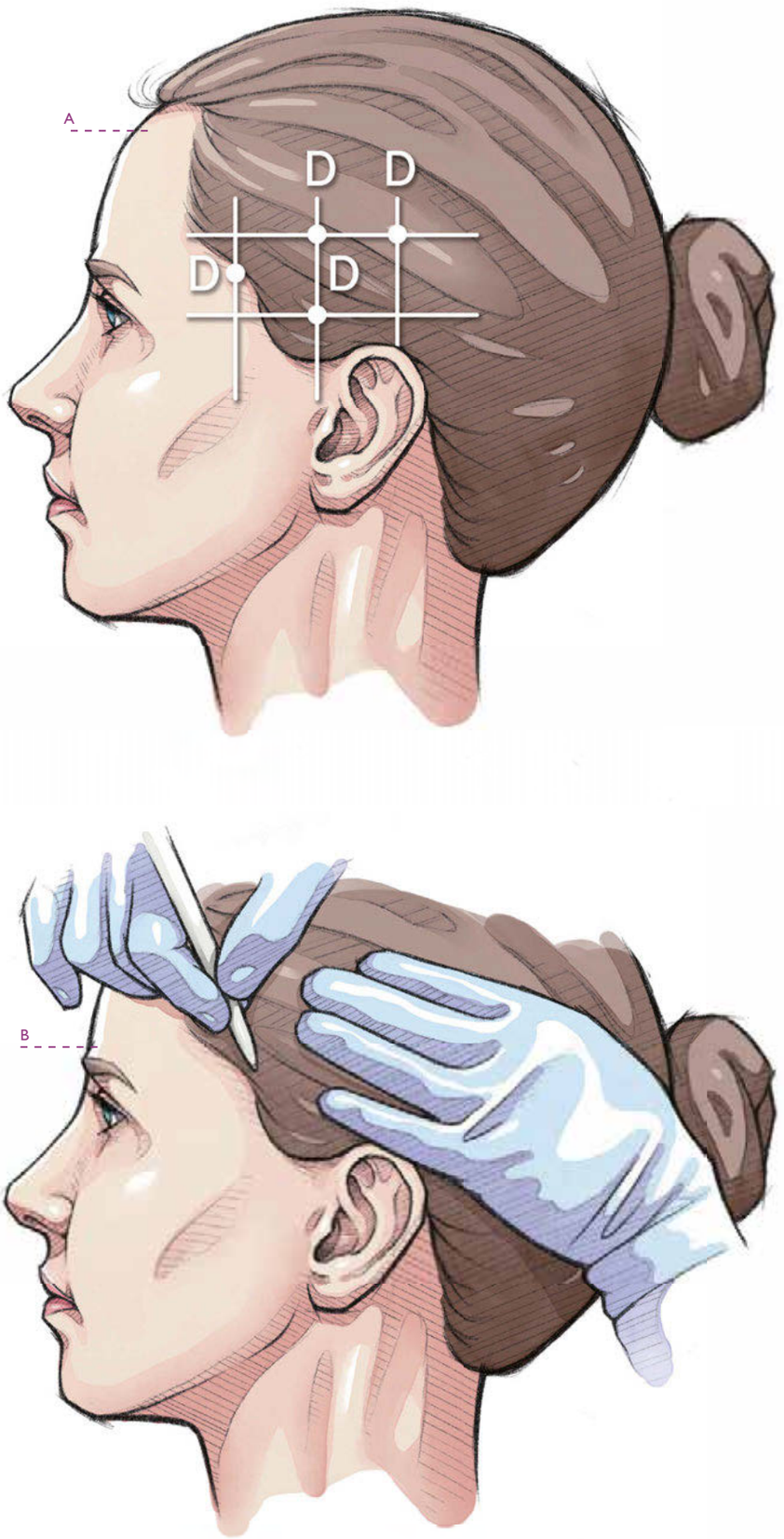
10-3. Application points in the procerus (5 U), in the corrugators of the eyebrow (5 U each), and the frontal with up to 25 U corresponding to the aesthetic dosage. In the image below, no-elevation protocol of the eyebrow.



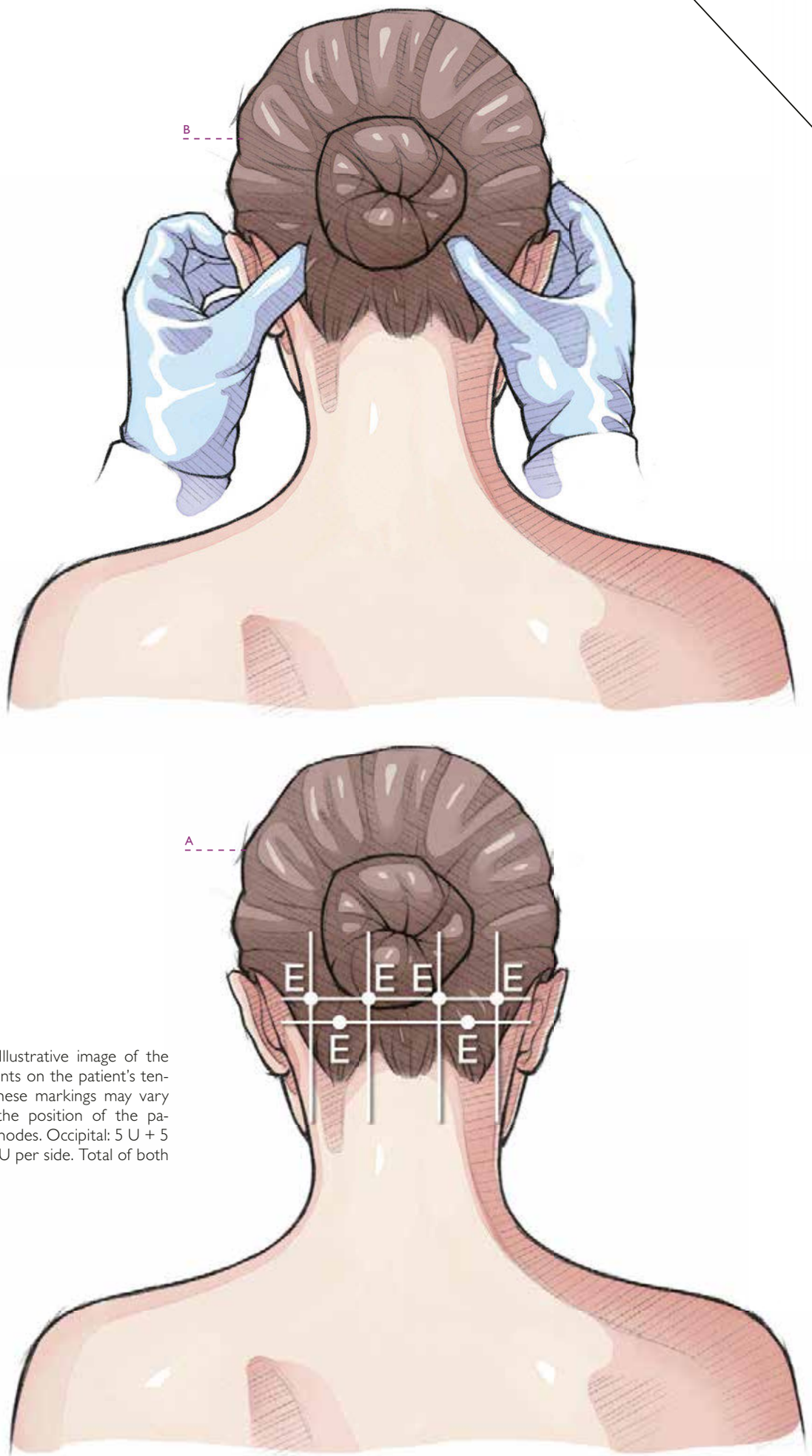
In the temporal muscle, it is recommended to apply four points of 5 U on the patient's tension nodes (for each side). If the patient has more than four tension nodes, an additional stitch may be performed on both sides, or two additional stitches may be performed unilaterally if indicated (ie, when there is a greater presence of tension nodes on one side compared to the other side) **(Figs 10-4A,B)**.

In the occipital region, three points of 5 U are applied to the tension nodes for each side **(Figs 10-5A,B)**. When needed, a total of two additional points can be made regardless of side.

For the spleen muscles and semithorny of the head, two points of 5 U are performed per side, in the areas of greatest stress **(Figs 10-6 and 10-7)**. The use of an insulin needle (13 mm) is recommended for this application. In the tension nodes of the trapezius muscle, the applications are performed in three points of 5 U each **(Figs 10-8A,B)** and, if necessary, a total of up to four additional 5 U points can be used regardless of the side. For this application, the use of an insulin needle (13 mm) is also recommended.



10-4. A,B – Illustrative image of the marking of points on the patient's tension nodes. These markings may vary according to the position of the patient's tension nodes. Temporal: 5 U + 5 U + 5 U + 5 U = 20 U per side. Total of both sides = 40 U.



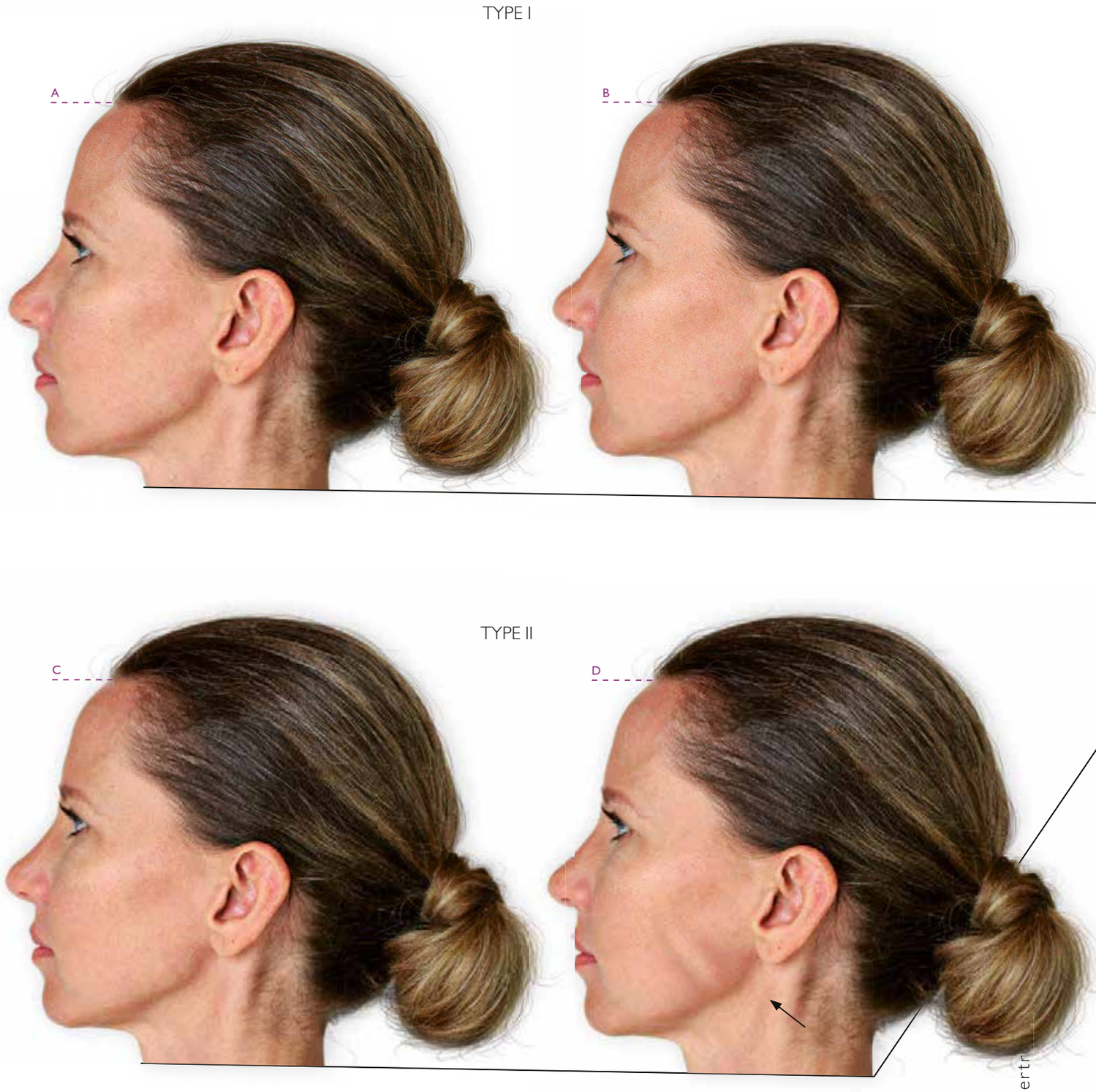
10-5. A,B – Illustrative image of the marking of points on the patient's tension nodes. These markings may vary according to the position of the patient's tension nodes. Occipital: 5 U + 5 U + 5 U = 15 U per side. Total of both sides = 30 U.

Masseter hypertrophy was initially described by Legg[14] in 1880. In clinical terms, masseter hypertrophy is presented as an increase, symmetrical or not, of this muscle.[17] It is easily observed by the resulting prominent angle of the mandible, giving the lower face an enlarged contour. Known etiological factors for the establishment of hypertrophy are stress, bruxism, and hypertrophy resulting from mastication,[2] in addition to genetic propensity. Hypertrophy is generally considered to be a reactional process or associated with stress.[3] Masseter hypertrophy is most frequently detected between 20 and 40 years of age, regardless of gender.[17] It affects all ethnicities but is especially prevalent in individuals from the Far East. It is from this region that most clinical trials are on the subject. In a recent study,[19] a classification of this hypertrophy was proposed based on the bulging of the masseter, and is presented in **Table 12-1**, clinically in **Figs 12-1A–D** and **Figs 12-2A–F** with its confirmation by the use of ultrasound in **Figs 12-3A–E**, respectively.

The hypertrophic masseter has an average transverse thickness of 12 mm. Mild hypertrophies have a thickness of around 10 mm, moderate hypertrophy between 10 and 14 mm, and advanced hypertrophies have a thickness greater than 14 mm.[19] The treatment of masseter hypertrophy can be surgical; thus, the application of botulinum toxin is a minimally invasive, easy, and safe alternative.[4,16] The use of botulinum toxin for the treatment of masseter hypertrophy was introduced by Moore and Wood,[15] in 1994, aiming to treat functional problems resulting from hypertrophy. The use of botulinum toxin for the esthetic reduction of the volume of the hypertrophic masseter was recommended by Rijsdik et al[15] in 1995.

TYPE	BULGING	DESCRIPTION	PREVALENCE (%)
I	Minimum	Bilateral contraction in balance, no palpable bulge	21,4
II	Single	Single, localized bulge	33,1
III	Double	Two distinct longitudinal bulges, with a difference in height or not	28,4
IV	Triple	Three longitudinal bulges	6
V	Excessive	Single, large bulge	11,1

Table 01. Classification of masseter muscle contraction with respect to bulging type.



12-1. A-D – Morphology of the types of masseter bulges at rest and during clenching. Type I, minimum **(A,B)**. Type II, single **(C,D)**.

GENERAL PRINCIPLES OF TREATMENT OF MASSETER HYPERTROPHY WITH THE USE OF BOTULINUM TOXIN

There are two distinct groups of authors that differ according to the objective to be achieved. The first seeks muscle atrophy through several applications of the toxin, respecting the therapeutic indication and the patient's complaint. Other authors recommend monthly applications in the masseter until muscle activity is absent, with complementary doses aimed at limiting muscle activity to up to 30% of the original activity. This second group clearly uses an appropriate therapy for cases of temporomandibular disorder, but this does not mean that the two treatment philosophies are not used both in facial harmonization and in temporomandibular disorders.[9,18] Another item to be considered in monthly applications is the vaccine effect that botulinum toxin can develop in the patient; the authors of this book advocate minimum quarterly intervals. Despite the indication for the use of botulinum toxin, there is a tendency to limit injections to a safe area established by observation of anatomy and perception of adverse effects. This area is limited superiorly from the inferior implantation of the ear to the angle of the mouth. The anterior limit of the masseter is delimited under the clenching of the teeth by palpation.[8,10,20] The security area is demonstrated in **Fig 12-4**.

12-4. Delimitation of the safety area – a line from the lower portion of the ear to the angle of the commissure – and delimitation of the anterior and posterior portions of the muscle by palpation under dental clenching. Injection points are marked within this area. Source: Klein.[12]

TREATMENT OF MASSETER HYPERTROPHY FOR ESTHETIC PURPOSES

DOSAGE AND INJECTION POINTS

A review of the literature shows that a standardization for the use of botulinum toxin A (TbA) is still necessary. In 2005, Choe et al[5] compared the use of 10, 20, and 30 TbA units and suggested that effects are observed from 20 TbA units and this is the dose to be injected if the masseteric thickness is greater than 10 mm. In the same year, Kim et al[11] proposed the use of 100 to 140 units in thicknesses between 10 and 16 mm. In 2007, Kim et al[10] compared the use of 25 and 35 TbA units without finding any statistical difference. Gaofeng et al,[6] in 2010, used 30 to 50 units per muscle, while Jaspers et al,[9] in 2011, used 36 TbA units distributed in three points per muscle. Klein et al,[12] in 2014, used 90 TbA units per muscle, distributed in three injection points, with 60% of participants (out of a total sample of 10 patients) reporting adverse effects up to 1 month after injections. Regarding the injection technique, dividing the dose into three distinct points is the most used technique, but the location of the ideal injection sites is still controversial.[6,13]

The dose to be injected will depend on the characteristics of the masseter, mainly its mass and volume. It is important to consider that muscle mass presents individual and gender variations. Generally, in men, the masseter has a greater mass and may require a higher dose of TbA. The required dose should also be based on observation of how the masseter behaves at rest, in everyday movements and under clenching. Skin thickness and texture also influence dose calculation.[4] For example, the skin of Asians is thicker and has more collagen than that of Caucasians.[1]

A classification of masseter hypertrophy can help individualize treatment using TbA. In the work by Xie et al,[19] treatment criteria based on the classification proposed by this same group and presented earlier in this section were used.

Mild hypertrophies less than 10 mm thick can be treated with 20 to 25 units per masseter. Moderate hypertrophy, with a thickness between 10 and 14 mm, requires a dosage of 25 to 30 units per masseter. Thicknesses greater than 14 mm can be treated with 30 to 40 units.

Likewise, the number of injection points can be individualized according to the proposed classification. In Type I hypertrophies, treatment may consist of a single injection of 20 to 25 units of TbA. In moderate hypertrophies, TbA can be distributed evenly across the bulge surface through two injections of 12.5 to 15 TbA units per point. In advanced hypertrophy, TbA can be injected at three different points and distributed evenly on the domed surface. In hypertrophies with a single bulge (Type II), an injection at the most prominent point of the hypertrophy is recommended. The total dose per muscle is therefore dependent on the degree of hypertrophy and the type of bulging present. In advanced hypertrophies with a bulge of more than 2 cm in diameter, TbA should be applied at two points per masseter.

In Type III hypertrophies, TbA should be applied to the most prominent points of each of the two bulges. The total dose of TbA should be calculated by the thickness (ultrasound) or extent (clinical) of the hypertrophy. The proportion of units to be applied in each injection must respect the ratio of the height of each bulge present.

Type IV hypertrophies, with three bulges, should receive an injection at the most prominent point of each bulge. The total dose per muscle should be determined by the thickness of the most prominent bulge. And the proportion of TbA must be determined by the proportion of the heights of each bulge.

Type V hypertrophy, with excessive bulging, should be treated with three injections at the most prominent point. A dosage of between 30 to 40 units of TbA is recommended. 50% of the dose is applied at the highest point, and two further injections of 25% of the volume applied adjacent to the first point, in a triangular configuration.

RESULTS AND SIDE EFFECTS

The use of TbA for the reduction of masseter hypertrophy is observed in the vast majority of cases. The minimum value of masseter thick-

BOLUS TECHNIQUE

In this technique, we will use the 27G needle or the same needle that comes in the filler to apply the acid to the marked points in the region. To delimit the cheek area, we draw a line that goes from the labial commissure to the outer corner of the eye, and another that goes from the tragus of the ear to the wing of the nose. At the intersection of the two lines, we draw an application point **(Figs 15-3A-C)** that will receive 0.2 ml of gel through an application positioning the needle perpendicular to the patient's skin, introduce half of the needle and dispense the volume of 0.2ml using the technique of bolus The intersection of the lines is the space of Ristow. It is worth remembering that the numbering of the syringe must be facing up, allowing correct visualization of the quantities. This way we do not rotate the syringe during application.

Above this intersection point, we will draw three more points with approximately 1 to 1.5 cm of distance between them, for the application of 0.1 ml in each supraperiosteal application **(Fig 15-4A,B)**, totaling 0.5 ml of gel (half a syringe) for each side of the face. Then, with the same lines on the opposite side of the face already drawn symmetrically **(Figs 15-4A,B)**, we start filling in the points on the opposite side. Applications in this technique are perpendicular to the face. Then we introduce the needle, and if we touch bone tissue, we can pull back slightly. We gently apply the gel at the first point, the intersection point **(Fig 15-5).** Then we went to the three points **(Figs 15-6A-C)**.

At the end of the applications, we can massage the patient's face when visible nodules of the filler are present. Massage should be performed gently from bottom to top just to distribute the material.[6]

15-3. A-C –Line that goes from the labial commissure to the outer corner of the eye. A line from the tragus of the ear to the wing of the nose. Application point at the intersection of the two lines (Ristow space).

15-4. A,B – Three points higher than the point of intersection (THE) Markings made on the opposite side **(B)**.

15-5. Applications in this technique are perpendicular to the face. First point of application of the gel.

15-6. A-C – Application at each of the three points above the intersection of the lines.

A PRACTICAL APPLICATION OF MYALURONIC ACID - PART 4

Eloá Luvizuto – Thallita Queiroz – Maria Aparecida Luvizuto

NOSE FILLING

In the last decade, there has been an explosion of new products and techniques in Aesthetic Medicine due to the increase in the number of patients seeking non-surgical esthetic procedures.[1] The statistics from the American Society for Aesthetic Plastic Surgery (ASAPS), every year, confirm the continuous request for so-called esthetic medicine procedures by patients.[2] Non-surgical esthetic treatments are generally preferred by patients because their effects are visible immediately after treatment and they can return to their normal activities on the same day.[3]

Surgical rhinoplasty, according to ASAPS statistics (2016), is the sixth most requested procedure; however, the so-called non-surgical rhinoplasty with fillers in recent years has proved to be an effective alternative for patients seeking only an esthetic improvement of the nose.[4] Several articles on Asian nose augmentation with fillers have been published[3,4,8]; however, in western countries as well, the so-called non-surgical rhinoplasty, often called a rhinofiller, is often performed, albeit for different purposes. The differences between Western and Asian noses are usually represented by a more projected anterior nasal spine and a more or less pronounced nasal hump in the first group; however, some other unsightly features can be observed.

A study, which evaluated the safety and satisfaction of 52 consecutive patients undergoing non-surgical rhinoplasty with hyaluronic acid (HA) filler injection, showed that among patients 96, 15% said they were "very satisfied" at the end of the procedure. In this study, there were no major complications or side effects from the procedures performed, and the authors concluded that the technique is safe and predictable, with a high degree of patient satisfaction.[5]

EXTERNAL ANATOMY OF THE NOSE

1. *Glabella:* frontal region immediately superior to the nose.

2. *Nation*: corresponds to the nasofrontal suture, immediately inferior to the glabella. It is normally the most sunken part of the back and is located a few millimeters below the nasion.

3. *Rhinion*: this is the name given to the osteocartilaginous union of the nasal dorsum.

4. *Nasal dorsum*: This begins in the nasion and is formed by an edge and two side walls. In the superior part are the proper bones of the nose and the ascending processes of the maxilla; and, at the bottom, the triangular cartilages.

5. *Upper valve*: it is found in the lower part of the back and is constituted by the upper or triangular lateral cartilages and their union with the anterior edge of the septum. It is the narrowest part of the upper airway (internal valve) and corresponds to the position where the separating grafts are placed to improve their functioning.

6. *Supratip*: it is the most inferior of the dorsum, immediately above the nasal tip. The transition point is called the supratip break.

7. *Nasal tip*: it is the most prominent or protruding part of the nose.

8. *Domus* or *tip definition points*: the most prominent part of the tip of the nose that corresponds to the two points of light in the frontal view. It is the cutaneous manifestation of the angle, or folding of the inferior lateral cartilages, at the point of transition between the alar cartilage and the intermediate crus.

9. *Soft triangle*: two small concavities on the sides of the tip definition points. They represent the transition area between the nasal lobe and the edge of the wings or alar rhyme.

10. *Infratip*: this is the part that lies between the tip definition points (domus) and the lobule columella, providing a smooth transition from the nasal tip to the columella.

11. *Nasal wings*: form the sides of the nasal tip and unite the tip lobe to the skin of the face.

12. *Columella*: separates, like a column, the two nostrils. Its consistency is given by the crus medialis, the most caudal part of the inferior lateral cartilage.

13. *Columella-labial angle*: formed by the labrum and columella. The nasolabial angle: formed by the upper lip and the nose, that is, between the upper lip and the line that goes from the base of the ala of the nose to the junction of the nostril with the columella **(Figs 15-1A,B)**.

Nasal base: presents a triangular shape and is formed by the tip lobe, the nasal wings, and the columella. It is formed by **(Fig 15-2A)**:

1. Domus of the nasal tip.

2. Infratype.

3. Soft triangle.

4. Nasal wing/rhyme or alar edge: unites, as if it were an arch, the lobe of the nasal tip and the lobe of the nasal wings.

5. Nostrils: external orifices of the nasal passages.

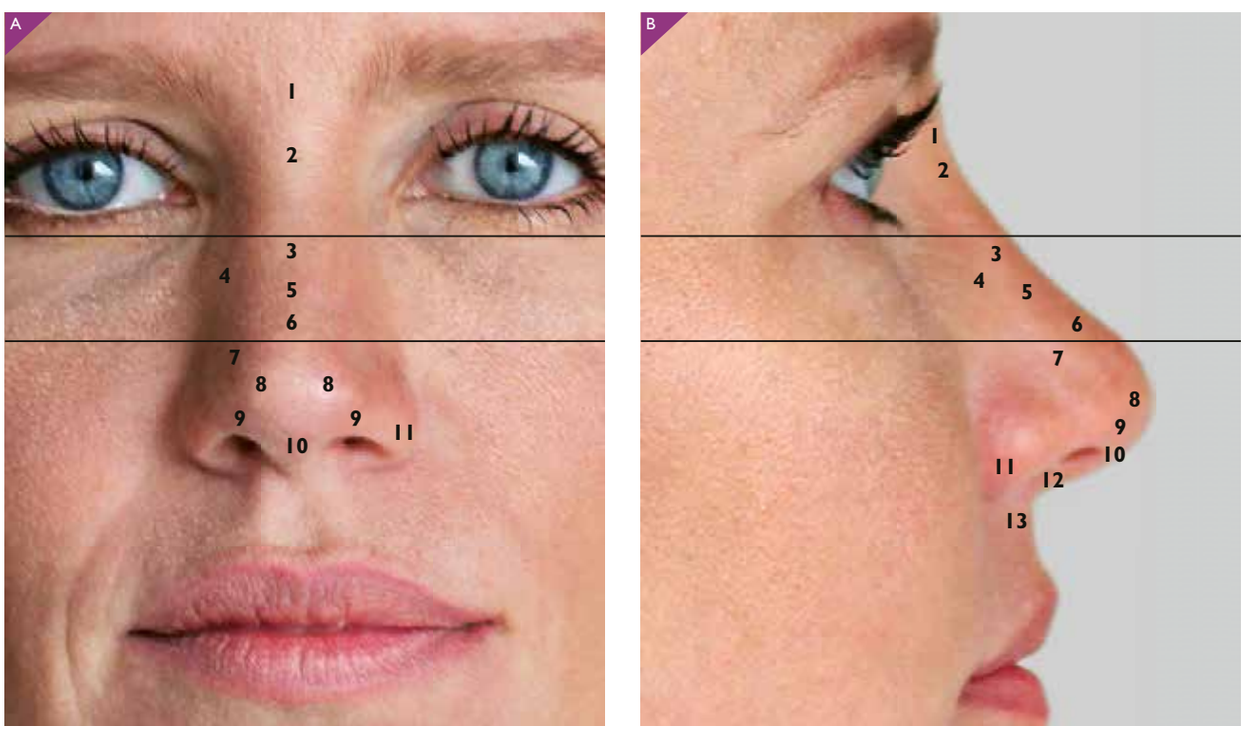
6. Columella.

7. Columella base.

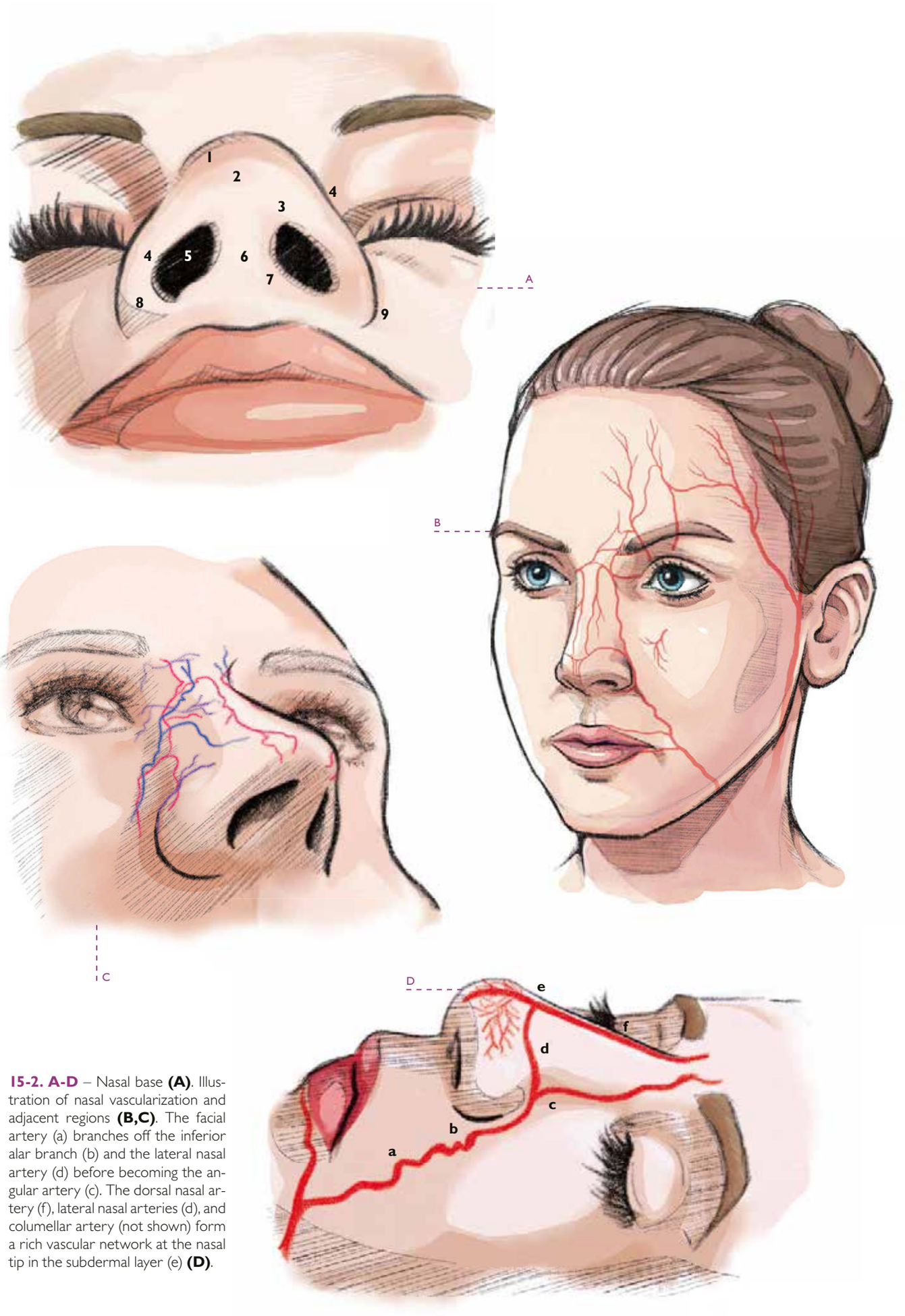
8. Nasal wing base.

9. Alar sulcus: it is the depression or sulcus that is found between the nasal wing and the dorsum.

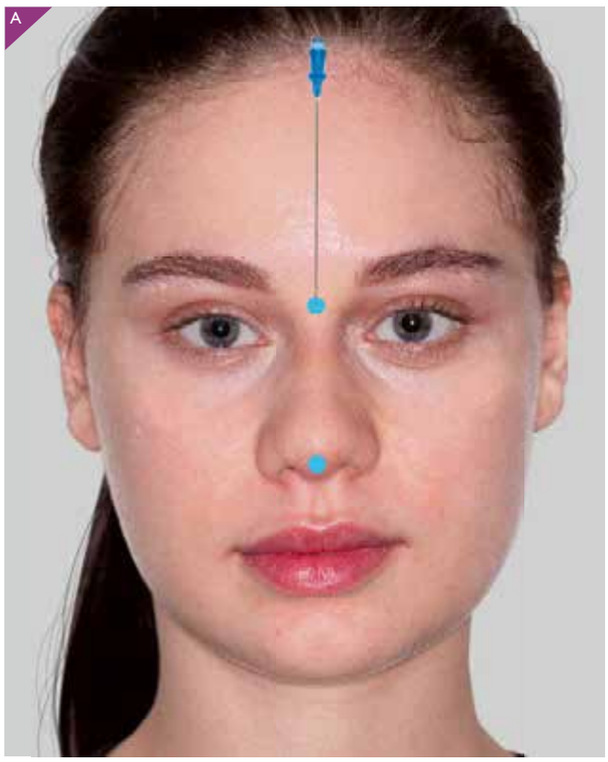
VASCULAR ANATOMY

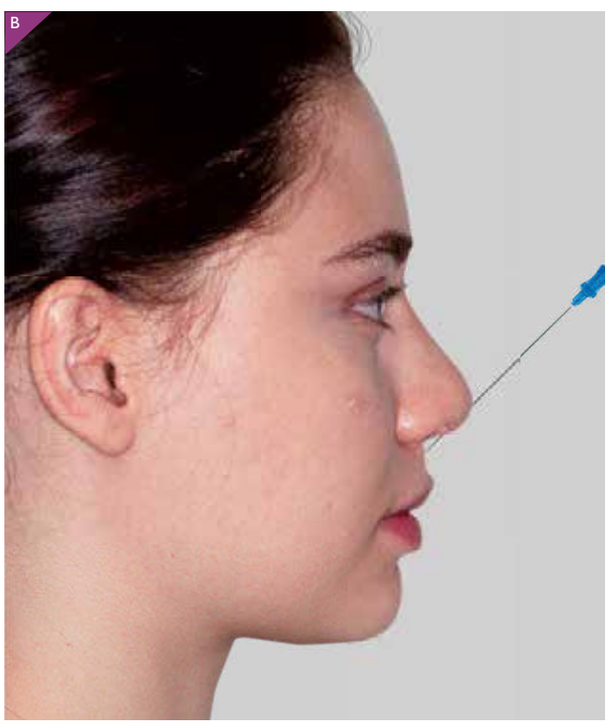


15-1. A,B – Risk areas: the regions of the upper third of the nose (glabella and nasion) and the lower third of the nose (nasal tip, domus, soft triangle, nasal wings).



15-2. A-D – Nasal base **(A)**. Illustration of nasal vascularization and adjacent regions **(B,C)**. The facial artery (a) branches off the inferior alar branch (b) and the lateral nasal artery (d) before becoming the angular artery (c). The dorsal nasal artery (f), lateral nasal arteries (d), and columellar artery (not shown) form a rich vascular network at the nasal tip in the subdermal layer (e) **(D)**.





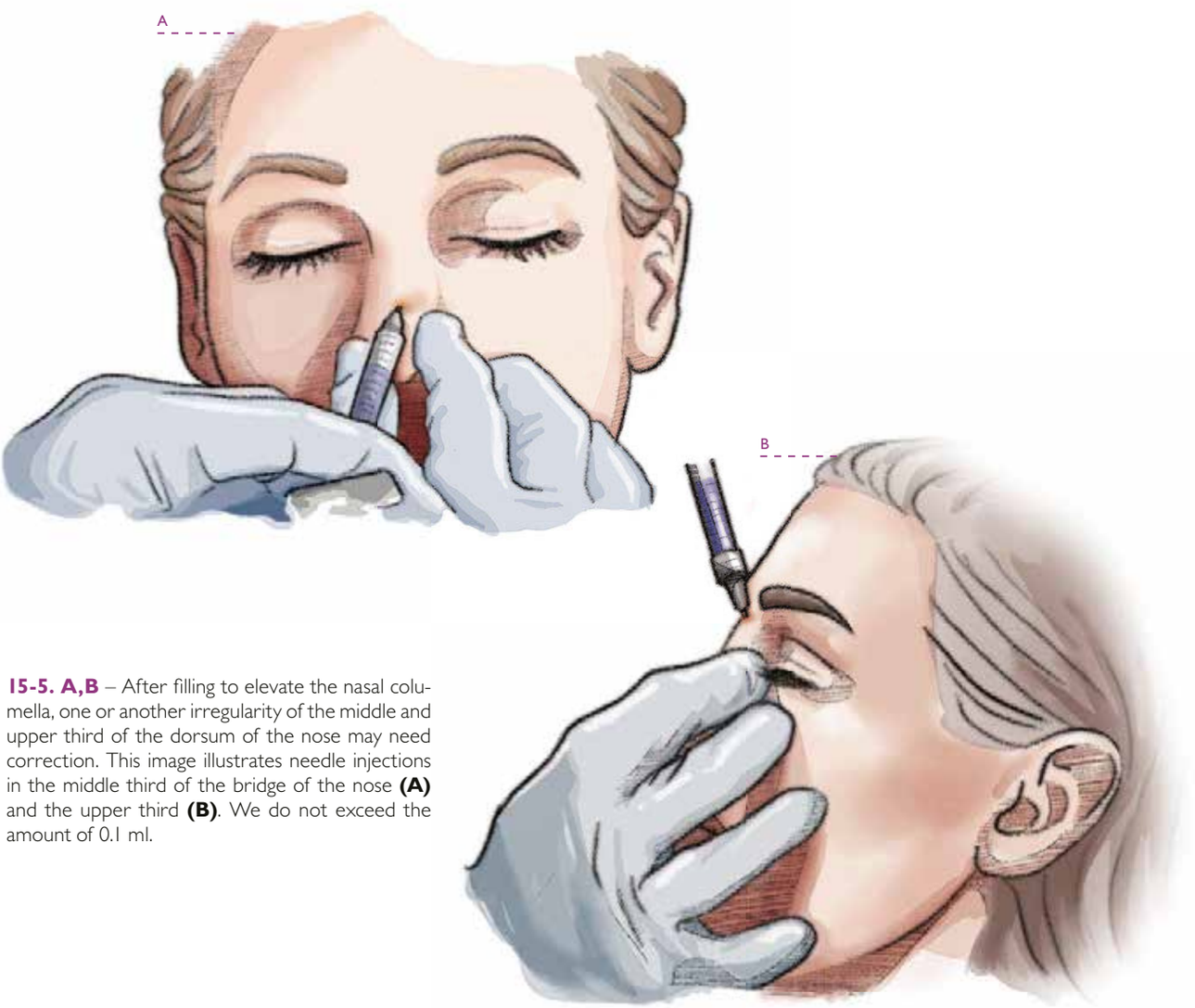
15-3. A,B – In blue are the two points of introduction of the 27G cannula. In the upper point, only 1 cm of the cannula is introduced to release 0.2 ml punctually. At the lower point, the cannula is introduced along the entire length of the nasal columella until it reaches the region close to the anterior nasal spine, 0.2 ml is released punctually close to the anterior nasal spine, and 0.1 ml is retro-injected along the withdrawal of the cannula in the nasal columella **(A)**. Cannula entry position to reach the vicinity of the nasal columella **(B)**.

TECHNIQUE (Figs 15-3 – 15-10)

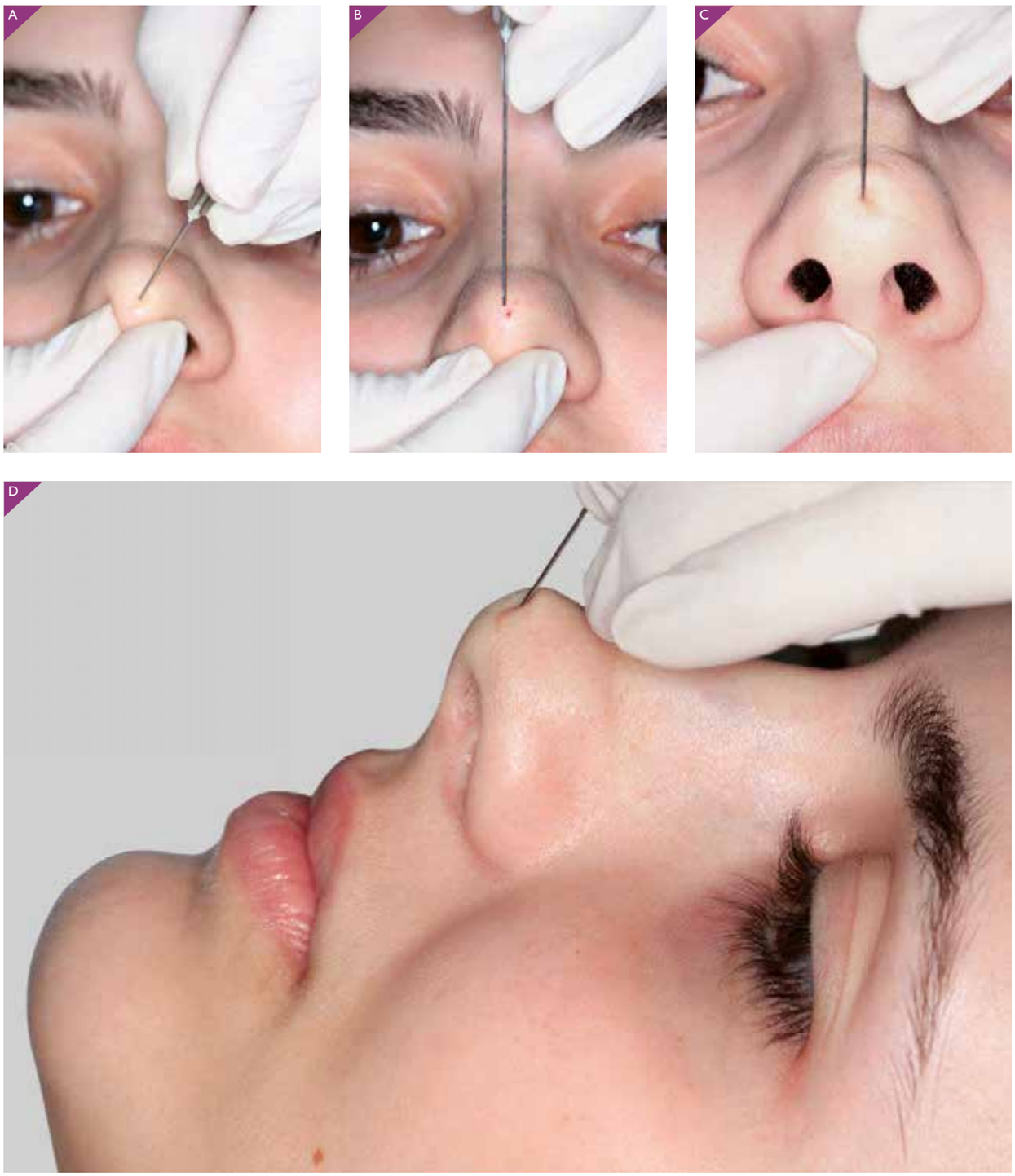
After a careful disinfection of the face, especially the nose, anesthesia of the bilateral infraorbital nerves and infiltrative anesthesia inside the mouth between the maxillary central incisors is performed with articaine with vasoconstrictor. At the tip of the nose, anesthesia without a vasoconstrictor is performed. For the case illustrated below, infrathrochlear nerve anesthesia was also performed bilaterally (for anesthetic techniques, see **Chapter 6**). When injecting into the nose, injections should be performed deep into the musculoaponeurotic layers, supracartilaginous and supraperiosteal layers to avoid injury or cannulation of vessels. The vasculature in the nose is located superficially below the dermis. Compression of the dorsal and superior nasal portions of the angular arteries is also recommended.

When injecting into the nasal dorsum and base, we recommend small amounts of filler by back-injecting and massaging after each injection. Before proceeding with any further injections, regardless of location, one should always wait 15 min to ensure that the skin is not compromised and then proceed. For the nasal tip, conservative volumes with a serial puncture technique should be used to avoid extrusion of the filler beyond the tip, creating a bulbous nose (maximum 0.1 ml). For non-surgical rhinoplasty, we used a medium-density filler. It is known that the denser the filler, the greater the risk of necrosis; similarly, the more hydrophilic HA can cause delayed edema after injection, also leading to vascular compromise.

15-4. A-D – Image before and after. Black arrows show the areas that have been filled in. The region anterior to the anterior nasal spine (angle of the nasal columella and nasal columella) was punctually filled with 0.2 ml of HA and 0.1 ml by retro-injecting from the base of the columella, passing through the columella until reaching the infratip region. 0.2 ml was introduced in the upper third of the dorsum of the nose (nasion: most sunken region of the dorsum risk area) **(A,B)**. Image before and after **(C,D)**.



15-5. A,B – After filling to elevate the nasal columella, one or another irregularity of the middle and upper third of the dorsum of the nose may need correction. This image illustrates needle injections in the middle third of the bridge of the nose **(A)** and the upper third **(B)**. We do not exceed the amount of 0.1 ml.



15-6. A-D – With a 22G needle, we make a hole at the tip of the nose for the introduction of the cannula **(A)**. Cannula being introduced into the hole made **(B)**. The cannula was introduced **(C,D)**.

The esthetic appeal has generated great demand for surgery to remove fat from the cheeks, popularly called "bichectomy", which aims to reduce the volume and improve the definition of the contours of the middle third of the face. Due to the disuse of eponyms and to avoid embarrassment and jokes with pejorative tones, we suggest the use of technical nomenclature to designate this surgical procedure, among which is cheek lipectomy or partial removal of the fat body of the cheek. The terms facial lipoplasty and/or facial liposculpture are not the most appropriate, technically, because "bichectomy" consists only of a procedure that removes a part of the fat located in the cheek, without repercussions on the fat distributed in other regions, not involving the thirds upper and lower face. The terms lipoplasty and/or facial liposculpture are more comprehensive and also involve blepharoplasty procedures with eyelid fat removal; submental fat liposuction; enzymatic lipolysis of submental fat and even facial fillers with fat grafting.

In addition to surgery for esthetic purposes, other procedures with an approach to the fat body of the cheek have been used to assist in the following treatments: closure of oroantral fistula, closure of cleft palate, filling of post-tumor resection defects and cyst excision, graft coverage bones.[3]

CHEEK LIPECTOMY GOALS

Cheek fat removal surgery is indicated for adults with a voluminous middle third of the face who wish to refine, sculpt, or accentuate the skeletal features of the face. It is also indicated in patients diagnosed with a tissue mass located on the cheeks resulting from fat displacement (pseudoherniation) and/or oral lipodystrophy.[20]

The reduction of the submalar projection will provide, in some patients, a very subtle result, mainly in those with a rounded face, which are commonly the patients who have the greatest desire for expressive results. In these patients, the association of bichectomy with the use of other procedures to complement facial harmonization has been recommended, such as facial fillers in the zygomatic regions, blepharoplasty, or cervical liposculpture.[14,19]

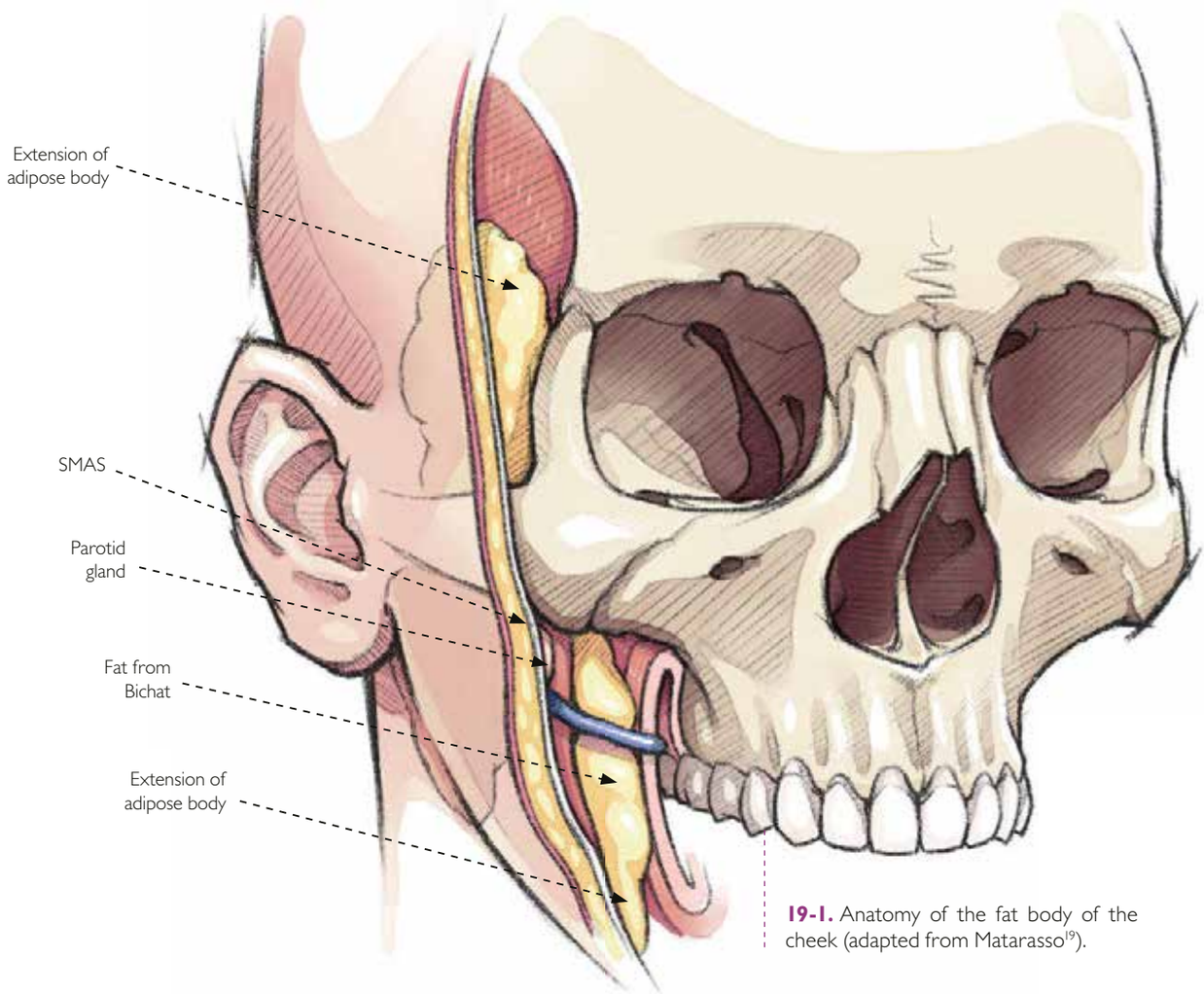
Although the vast majority of these procedures are performed for esthetic reasons, a specific group of patients can benefit from a functional aspect. People with reports of recurrent trauma to the oral mucosa, resulting from frequent bites on the cheeks, with complaints of pain, speech, and chewing difficulties, will be indicated for the removal of the fat body of the cheek to reduce the volume of soft tissues in the oral space. In these cases, the use of a variation of the surgical technique developed by the authors described below is suggested, in order to obtain better functional results.

ANATOMY, IMAGING, AND DIFFERENTIAL DIAGNOSIS

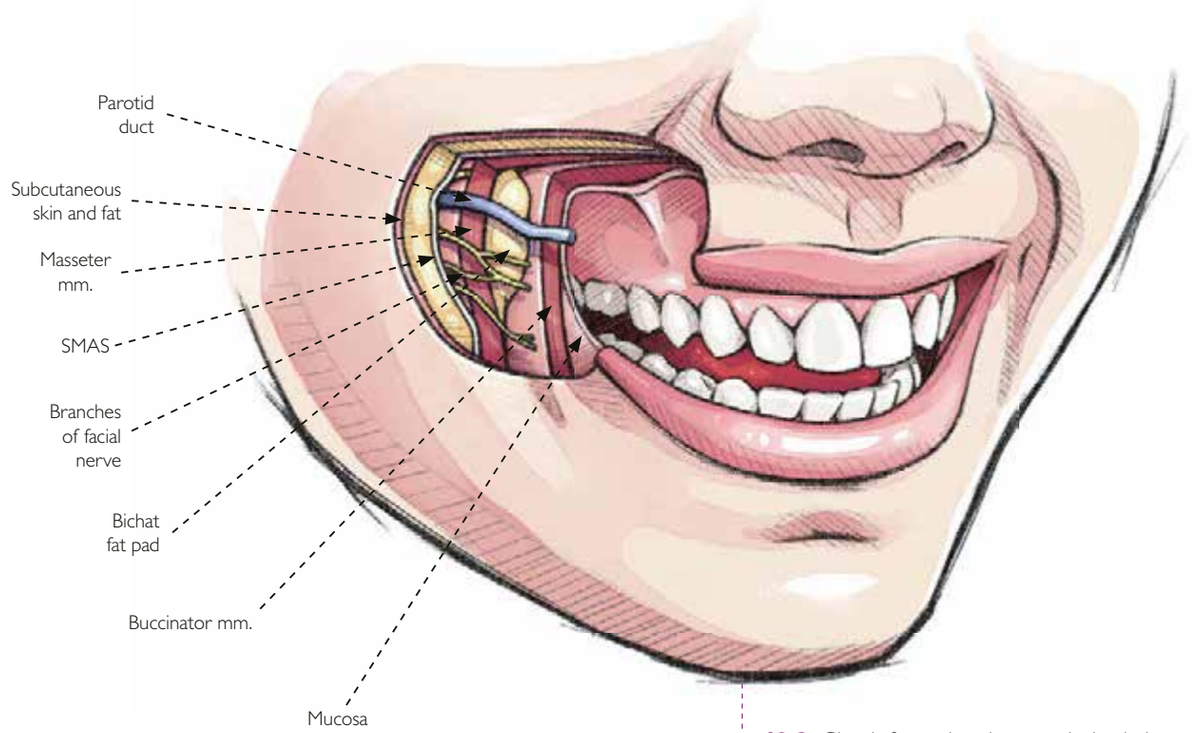
The fat pad of the cheek anatomically consists of three independent lobes: anterior, intermediate, and posterior, with each lobe encapsulated by an independent membrane and separated by a natural space. These lobes are suspended by six ligaments and anchored in the following anatomical structures: maxilla, posterior region of the zygoma, internal and external regions of the inferior orbital rim, temporal tendon, and membrane of the buccinator muscle, and anatomical variations may occur in which some of these ligaments are absent.[17,49]

The "Bichat fat pad" represents the main body, which corresponds to the posterior lobe, with four extensions: buccal, pterygoid, temporal (superficial temporal), and pterygopalatine (deep temporal). The main body course is along the anterior border of the masseter muscle and is distributed deep into the posterior region of the maxilla and buccal vestibule. From an esthetic and surgical point of view, it is important to remember that the main body and mouth extensions correspond to approximately half of the total weight of the fat body, run more superficially, and are responsible for the contour of the cheeks. The temporal, pterygoid, and pterygopalatine extensions are smaller, deeper, and have less impact on the facial contour.[27]

Regarding the size of the fat body of the cheek, it is observed that there are no statistical differences between the right and



19-1. Anatomy of the fat body of the cheek (adapted from Matarasso[19]).



19-2. Cheek fat pad and anatomical relationship with adjacent structures (adapted from Matarasso[19]).

left sides. However, differences are observed when comparing gender and age: in men, the average volume is 10.2 ml, while in women, it is 8.9 ml. Concerning age, there is a substantial decrease in fat volume with aging.[17,27]

An important feature is that the size of the fat cheek is not directly related to the amount of subcutaneous fat, that is, it does not mean that people with a higher body mass index have a larger "Bichat fat pad."[1]

Understanding the anatomy is essential for performing the surgical technique to reduce the risk of damage to adjacent structures, and the main concerns are the branches of the facial nerve (zygomatic and buccal) and the duct of the parotid gland, which crosses the anterior and side of the "Bichat fat pad." **(Figs 19-1,2)** It is important to remember that in about 73.7% of the cases, the facial nerve superficially crosses the fat body, and in an incidence of 26.3% of the cases, two branches of the facial nerve were found passing through the buccal extension of the "Bichat fat pad."[12] Hwang presents a diagram to establish a safety margin related to the branches of the facial nerve and parotid duct in the oral region.[13]

19-3. Magnetic resonance imaging exam – axial section with T2 weighting. Arrows indicate the fat pad of the cheek.

Vascular nutrition of the cheek fat body is mainly provided by three blood vessels: anterior deep temporal artery, posterior superior alveolar artery, and buccal artery, while the venous drainage is provided by tributaries of the deep temporal, alveolar, buccal, and venous plexus veins. pterygoid and ophthalmic vein.[22]

In addition to the knowledge of the local anatomy, it is important to know that there are several pathological conditions, many of them tumoral and rare, that may originate from the adipose tissue of the cheek and should be considered in the differential diagnosis when volume or structural changes are present, including lipoma, lipoblastomatosis, liposarcoma, hemangioma, arteriovenous malformation, nodular fasciitis, and pseudoherniation.[7,9,18,20,24-26]

As a result, some imaging tests are indicated to aid in diagnosis and surgical planning. Liang et al[16] report the importance of magnetic resonance imaging (MRI) **(Figs 19-3)** as a tool in reconstructive and esthetic surgeries, mainly because it provides soft tissue images with greater definition than computed tomography (CT) exams. Thus, MRI scans can be used in preoperative diagnosis and planning and in the evaluation of postoperative results in liposuction, removal, and/or addition of fat.[16] Due to the cost and ease of acquisition, CT exams are more commonly used. They present good image definition and easy interpretation, are able to work with different slice planes and contrasts, and are extremely useful in the differential diagnosis.[11,15]

Ultrasound is another complementary imaging exam that can be used[2], with the advantage of having a lower cost when compared to CT and MRI exams. However, it needs more experience to interpret the images due to their lower definition.[4]

PRIOR MEDICATION

Two tablets of decadron 4 mg 1 h before the procedure. Antibiotic prophylaxis with 1 g of amoxicillin 1 h before the procedure. Patients at risk of bacterial endocarditis prescribe 2 g of amoxicillin 1 h before the procedure. For those allergic to amoxicillin, clindamycin 300 mg is prescribed (2 tablets 1 hour before).

SURGICAL TECHNIQUE

As with any surgical procedure, performing initial clinical examination is an essential factor to avoid intercurrences and reduce the risk of accidents and complications. In addition to collecting basic information regarding the health and medical history, special attention should be paid to the patient's main complaint, as well as the goals and expectations with the results of the surgical procedure. It is not uncommon to identify patients who have a false expectation of the results that cheek lipectomy can provide.

Despite being a minor surgery, it is recommended that, as with any surgical procedure, all biosafety care and protocols are adopted. Unfortunately, it is common for professionals unfamiliar with surgical procedures to neglect such conduct. In this way, the following are recommended:

- Intraoral antisepsis: mouthwash with 0.12% chlorhexidine gluconate for 1 minute.
- Extraoral antisepsis: removal of makeup or other products from the skin of the face and neck and antisepsis with 2% chlorhexidine gluconate (as an alternative, polyvinyl-pyrrolidone-iodine – PVPI – can be used).
- Sterile fenestrated field apposition.

ANESTHESIA

As the removal of the fatty bodies of the cheek is a simple and fast procedure, there is no need and/or indication to perform it under general anesthesia, except in cases with specific indications. The gold standard for performing this procedure is the use of local anesthesia assisted by intravenous sedation. As this type of sedation is not always easily available, as it depends on a minimal structure (oxygen cylinder, monitor, nasal catheter, equipment for intravenous medication) and the availability of an anesthesiologist, oral sedation can be performed, with ingestion of 15 mg of midazolam between 15 to 30 minutes before starting the surgery, or even without any type of sedation. As it is not a long procedure, the use of an anesthetic with a moderate duration of action, such as lidocaine or 2% mepivacaine, is recommended, associated with a vasoconstrictor, preferably epinephrine 1:100,000.

Recommended anesthetic techniques are posterior superior alveolar nerve and buccal nerve block, followed by local infiltrations to optimize local vasoconstriction. Only the local infiltrative technique does not provide adequate anesthesia and, in certain cases, the patient reports pain when pulling the fat body, especially when the buccal extension of the fat is greater.

ACCESS/INCISION

Incisions can be performed with a 15 or 15C scalpel blade; electrocautery can also be used.

Anatomically, access to the fat body of the cheek can be through a vertical or horizontal incision or an incision made at the bottom of the superior gingivolabial sulcus. A vertical incision at the bottom of the superior gingivolabial sulcus is the most recommended. Vertical incision: with the tissue well separated horizontally, the professional detects the parotid papilla (image circled in purple) and the patient's maxillary second molar. The incision will be made 1 cm from the parotid papilla and vertically along the axis of the second molar (the lower half of the incision is parallel to the clinical crown of the tooth, and the upper half is positioned above the cervical of the tooth); incision of approximately 1.5 cm; **(Fig 19-4A)**. Horizontal incision: the horizontal incision is below the parotid papilla and parallel to the patient's linea alba; an incision of approximately 1.5 cm **(Fig 19-4B)**.

Incision made at the bottom of the superior gingivolabial sulcus: Incision superior to the parotid duct: this is the access described by Matarasso, and consists of an incision made at the bottom of the superior gingivolabial