

NEW TRENDS IN RHINOPLASTY: SOFT SURGERY TO THE MEDICAL APPROACH

Frédéric Braccini discusses the newer techniques in the specialty of rhinoplasty, as well as presenting an overview of the basic anatomical features of the nasal area



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ABSTRACT

The surgical procedure of rhinoplasty is one of the most interesting and complex aesthetic surgeries. The main goal of aesthetic and artistic rhinoplasty is to achieve a natural look of beauty enhancement to create a harmonious face. There is no one standard rhinoplasty procedure, but many rhinoplasties that must suit to each individual patient. Everyone demands a better sense of wellbeing and self-confidence in the quest of beauty. Rhinoplasty aims to improve facial aesthetics, as well as nasal breathing function, which is also an important factor for patients. Rhinoplasties have evolved in much the same way as other plastic surgery procedures: more radical; more preserving of the function; and a simplified concept and procedure. Rhinoplasty procedures are simplified through the objective of reducing surgical trauma and optimising down time. It remains a surgical act, but newer fields of aesthetic medicine modify its philosophic and technical approach. Furthermore, approaches which propose an external approach and large dissection are now becoming much less common. In this article, the author describes his own surgical strategies and the place of non-surgical solutions to modify the appearance of the nose.

A FULL ANALYSIS OF THE NOSE IS necessary before undertaking any surgery, but the nasal tip is a key aspect of facial harmony. It is mobile and this depends on the muscle activity of both the nasal spine area and nostril area.

The nasal position is of great importance for an harmonious facial balance. The shape and position of the nasal tip, therefore, are defined by static and

dynamic anatomical structures that the facial plastic surgeon has to understand for a precise correction and a successful outcome.

The skin and its thickness also play a role in the shape of the tip and its contours. The nasal tip must be analysed both as part of the nose and as an individual anatomical structure. The base of the nose should be analysed at the same time as it holds the tip in position and assists in aspects of mobility. Nasal tips are defined by their projection, rotation and contour definition.

The tip projection is adequate when 50-60% of the nasal tip is located in front of the vertical line passing through the upper lip, and also when the tip is ideally equal to 60-65% of the nasal length (measured from the naso-frontal angle to the tip).

This article describes the main principles of the mini-rhinoplasty and analyses the place of non-surgical procedures and techniques in the aesthetics of the nose.

The mini-rhinoplasty

First described by French facial plastics surgeons³, the mini-rhinoplasty technique is a quick, simple, and reproducible procedure. It is a reduction rhinoplasty, which can be carried out in a 1-day surgery.

Method

The experience of the author, based on more than 1000 mini-rhinoplasty procedures is reported, as well as the

KEYWORDS

rhinoplasty, surgery, dermal fillers, hyaluronic acid, botulinum toxin, aesthetic



surgical steps that should be followed²⁴. All successive technical sequences are essential to perform rhinoplasty in a consistent and reproducible way. The rigor of the operating time allows a significant number of cases to be seen, and to actualise an intervention within 30 minutes.

Indications

The mini-rhinoplasty procedure is indicated in patients who need reduction rhinoplasty, or have minor deformities, particularly in those with nasal hump or hyper-projected noses, with no deviation. The nasal tip should be normal or only slightly drooping.

Technique

The surgical steps of this procedure are outlined in *Figures 1-4*:

- Incisions using the endonasal transcartilaginous approach
- Tip correction via alar cartilage resection
- Septum shortening and hump resection
- Lateral osteotomy
- Fracture
- Nasal base adjustment and suture.

Results

The surgical technique of the mini-rhinoplasty is safe and reproducible; aesthetic outcomes are excellent (*Figure 5*). This technique is also indicated in older patients who require facial rejuvenation.

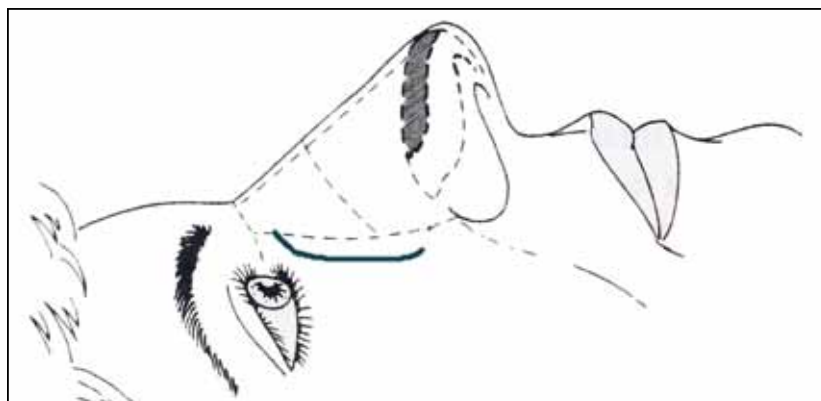


Figure 1 Incisions using an endonasal transcartilaginous approach

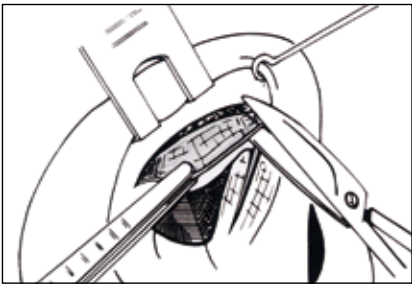


Figure 2 Tip correction via alar cartilage resection

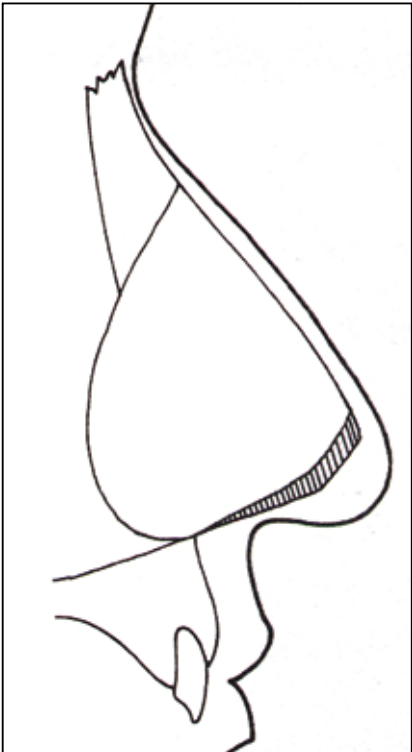


Figure 3 Septum shortening and hump resection

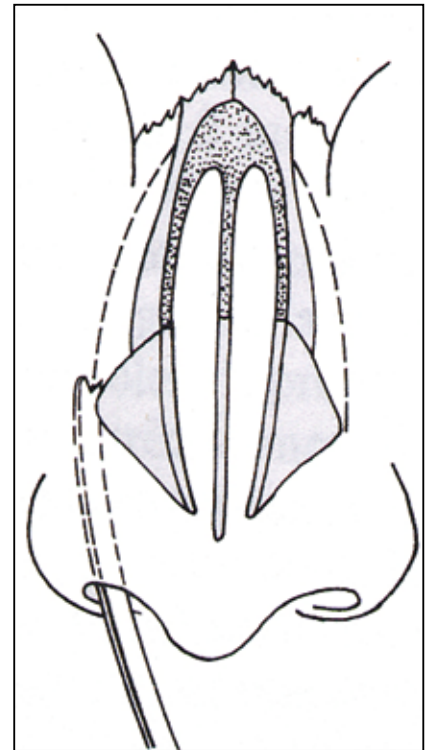
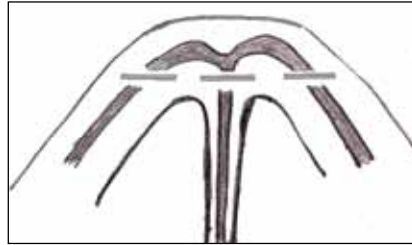


Figure 4 Lateral osteotomy

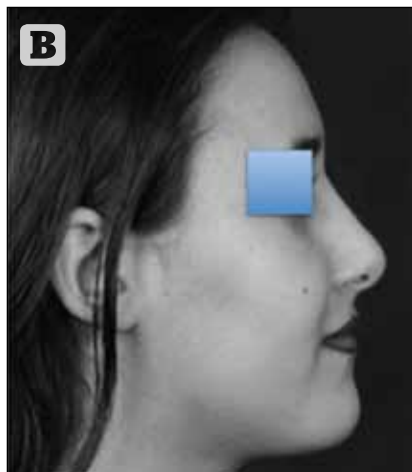
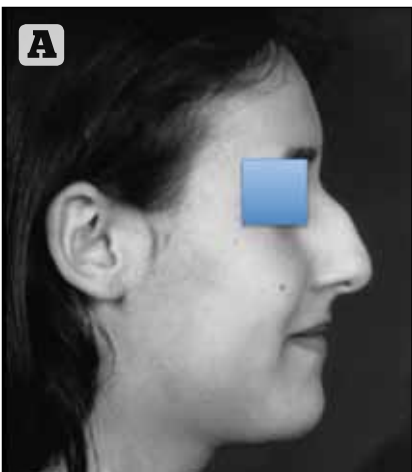


Figure 5 Excellent outcomes can be achieved using the mini-rhinoplasty approach. (A) before and (B) after treatment

Indeed, this surgical technique is a minimally-invasive procedure with minimal to zero complications in the postoperative period. The postoperative management of patients undergoing this procedure is of paramount importance to maintain the results.

The medical rhinoplasty

The non-surgical treatment of the nose, or medical rhinoplasty, has become one of the prime procedures in the aesthetic treatment of the face⁸. The absence of important mechanical constraints associated with the stability of the support of the nasal pyramid (cartilage and bone) provide a particularly favourable 'bed' for fillers in this area.

The duration of filling is more important here than on any other area of the face because of the immobility of the nasal zone and the solids supports (bone and cartilages).



Figure 6 Example of secondary correction using the mini-rhinoplasty procedure: (A) before and (B) after

Initially reserved for the correction of surgical imperfections post-surgery, the indications of treatment are very wide today, including:

- All camouflage procedures
- In older people (general anaesthetic not possible)
- In minimal abnormalities
- When the patient wants to try the procedure before undergoing 'classic' surgery (like 'medical morphing').

In many cases, in the first instance it is possible to offer treatment of poor cosmetic procedures in the nasal area, either associated or otherwise with botulinum toxin injections in the event of hyperactivity of the muscles (i.e. depressor septi nasi muscle).

Furthermore, these combinations of treatment can serve as true medical 'morphing' for patients who will then take the plunge and undergo more invasive surgery. However, it should be remembered that these techniques are in no way concurrent with surgery.

Rhinoplasty remains foremost a highly surgical procedure (Figure 6), but the use of fillers and botulinum toxins compel us to apprehend the indications for treatment and the advice we give to patients in a different way^{6,7}. The objectives of treatment arise from an artistic analysis of the nose and its relationship to the rest of the face.

The author will often attempt to modify:

- The nose in its own unit and its volumes, which corresponds to nasal volumetry
- The nose within the face, with regard to the total harmony of the face (in particular contact angles to the face and with the upper lip).

Contemporary treatment of the lip and chin with dermal fillers will also create a medical 'profiloplasty' (i.e. a full harmonisation of the face).

The anatomical basics

Knowledge of the basic anatomy of the face and nose is essential to understand the aims of treatment and to understand the possible risks related to the injections⁸. In

fact, there are no high vascular or neurologic risks, other than if the physician mistakenly injects the angular vessels. It is also important to remain cautious and avoid injections of high pressure at the tip of the nose (to avoid skin necrosis).

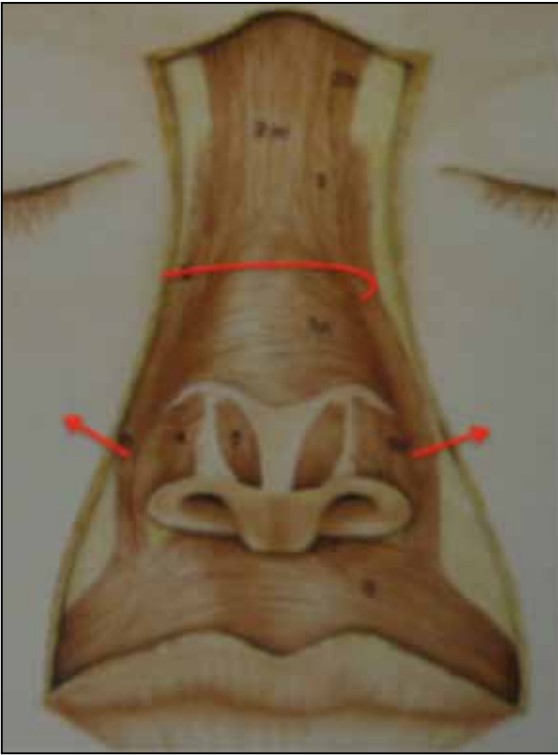
Occupying approximately one third of the face, the nose is a hollow triangular pyramid of osteocartilaginous structure, with the top corresponding to the root of the nose and a base where the nostrils open. On this osteocartilaginous frame (Figure 7), lies an envelope comprising perichondrium and periosteum. These fibres are inter-connected and between them, form the nasal pyramid. The structure of the nose confers to each individual an anatomical feature determining the beauty and harmony of the face.

In this way, the following aspects can be seen:

- A fixed portion (formed by the frontal notch), the rising branches of the jawbones, the clean bones, the higher side cartilages (triangular) and the septum
- A mobile portion, essentially corresponding to the lower side cartilages (wing), but also to the higher side cartilages (lower portion), which play a vital role in the nasal valve.

Figure 7 Anatomic preparation: the bone and cartilaginous nose: T=triangular cartilage, A=alar cartilage





SPIKE: can you lighten this image?

Figure 8 The muscles of the nose

The relationship between the fixed and mobile elements of the nose is fundamental in the aesthetic analysis and the medico-surgical undertaking of rhinoplasty.

The applications of surgery rely on an understanding of dynamic and static correlations between the nose and its structures; this is therefore a fundamental aspect that the physician should fully understand before carrying out a treatment of medical rhinoplasty using fillers.

The skin, which is very rich in sebaceous glands compared with the cartilaginous framework of the nose,

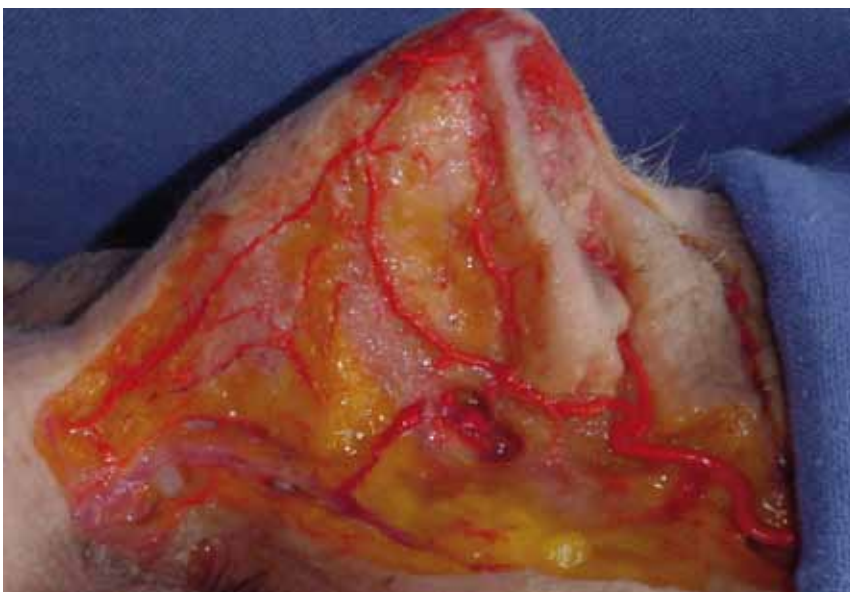


Figure 9 Cross-sections showing the vessels and nerves of the nose

significantly varies in thickness according to area. Indeed, very fine on top, it thickens in an important way toward the point compared with the weak triangle of Converse. Mobility in the segment becomes adherent with the subjacent planes in the portion corresponding to the lobule. This adherence is especially intimate on the lobule, the wings, and superficial partition. The cellular fabric is under-cutaneous, little developed and low in grease, and forms a rather clear layer only on the level of the mobile nose.

The muscles (*Figure 8*), innervated by the facial nerve, are connected by the superficial muscular aponeurotic system (SMAS). It is possible to see the elevator muscles, depressors, compressors, or dilating of the nostrils. Their role is generally modest apart from the depressor of the septum (i.e. depressor septi nasi). The role of this muscle is as a direct antagonist of the other muscles of the nose, drawing the ala of the nose downward, and thereby constricting the aperture of the nares. The others muscle groups are less important in the dynamics of the nose, but all are perfectly responsive to the action of botulinum toxin.

The vessels and nerves of the nose also require an in-depth understanding on the part of the physician (*Figure 9*). There is a high risk of vascular or nerve injuries, depending on the type of filler injection used. Vessels are small in size on the level of the angular area of the internal eye. This vascularisation is ensured by the arterial branches of the internal carotid network (ophthalmic) and external carotid artery (facial artery). The veins drain towards the angular vein essentially, but also towards the facial vein.

With regard to innervation, the branching engines come from the facial nerve and the sensitive branches emanate from the trigeminal nerve via the external nasal nerve, from the infraorbital nerve, and the nerve naso-lobar.

The products

The author has used a range of filler products when treating the nose (e.g. polyactic acid, polyacrylamide gels, calcium hydroxylapatite, hyaluronic acid). Taking into account the smoothness of the cutaneous coating, it is necessary that the product injected benefit from a perfect balance between its homogeneity, its potential of diffusion in filled spaces, and of course, its harmlessness. The author avoids the use of permanent fillers as there is too high a risk of complications, and if surgical rhinoplasty is performed after such injections, the surgery became much more difficult and prone to complications.

Among the many fillers available, the author's choice has gradually settled on hyaluronic acid, which can be safely injected in all areas; at the same time on the fixed level of the nose, but also at the level of the nasal point where cutaneous tension is very important and where the tolerance of the product must be optimal^{6, 7}. The product must be of a constitution that has high reticulation for a stable result. It is necessary to use products which have a very high tolerance and safety profile (eg. XHA-3, Laboratoires Filorga).



Figure 10 Example of treatment process and plan

The injection technique

Ideally, the procedure is made after the application of anaesthetic. It can, however, be carried out without any anaesthesia. The nasal point is the most significant part of the treatment. It is necessary, therefore, to draw up well its plan of treatment before starting to inject (*Figure 10*). Indeed, the nasal cutaneous tension—in particular on the level of the point—is such that if too many injections are carried out, the product tends to be extruded.

A number of treatment procedures can be followed, some of which are outlined below.

Filling the hump

The needle is introduced at an obliqueness of 45° until contact with the osseous is made. The needle should be held in the dominant hand. The thumb and the index finger of the other hand should apply a pressure to the side walls of the clean bones to prevent the product from diffusing laterally. This accidental diffusion of the product can spread to the level of the ocular ring and tear valley, and therefore must be prevented. It is sometimes necessary to fill the frontal nasal angle via a side access to perfect the treatment of this area. Once the product has been injected, it is set using careful massage.

Definition of the tip

As discussed, it is necessary to avoid multiplying the injection points. One or two points of penetration are therefore carried out. They make it possible to distribute the whole of the product by emitting throughout the tip (treatment of the nasal point); the pressure of the injection is essential here. It is paramount to be slow and progressive to avoid any cutaneous damage, which can lead to necrosis.

Treatment of the columellar and opening of the naso-labial angle

This treatment can be carried out when a treatment of botulinum toxin is not carried out at same time. One deeply injects the product, which is deposited at contact with the nasal spine, to open the angle. The lines of columellar are then balanced more superficially.

The use of botulinum toxin

Botulinum toxin A can be used for treatment of the nose, and only those varieties permitted for aesthetic use in each country, particularly:

- Vistabel/Botox Cosmetic, derived from Botox, Allergan. It can be in packs of 50 or 100U to be kept in the refrigerator between 2°C and 8°C
- Azzalure, distributed in Europe by Galderma, directly derives from Dysport, Ipsen. It is moderately stronger than Botox, and comes in 125U, which must be stored in a refrigerator between 2°C and 8°C.

The different preparations are not interchangeable and the specific units are diverse, just like their action in the tissues.

The author generally recommends injecting at three different sites (e.g. *Figure 11*):

- Two injections of 2.5U Vistabel or 5U Azzalure in each elevator muscle of lip and nasal wing, parallel to the nasal wing (*Figure 11a*)
- 5U Vistabel or 10U Azzalure at the nasal point (*Figure 11b*)
- 5U Vistabel or 15U Azzalure at the level of the nasal spine divided into two planes; the first injection must be subcutaneous and the other deeply in contact with the bone (*Figure 11c*).

Protocol of treatment

The protocol of treatment is standardised. The first procedure is carried out without over-correction, followed by a control on the 15th day. In the event of needing a reinjection or technical refinement, this is carried out. The result is then remarkably stable on 12-18 months when using the filler, and stable for 4 months when using botulinum toxin.

Indications

Fillers

The indications for the use of a filler arise from the artistic analysis and the realisation of the project, as well as a surgical rhinoplasty^{6,7}. A data-processing morphing can also be carried out before the treatment.

After surgical rhinoplasty, any irregularities (e.g. asymmetry, deviation) can be rectified by using a filler. The indications of these fillings are the same as that of the cartilaginous grafts.

In first instance, the camouflage of osteocartilaginous kyphosis is paramount. The treatment of the point and filling of contact angles with the lip or the face can provide remarkable results.

Botulinum toxin

The control of mimical facial wrinkles using botulinum toxin A is currently a well-known process, even in all 'off-label' uses, but its use at the level of the nasal muscles is a more recently described process^{9,10}.

This new therapeutic target presently opens a wide application area and, relying on the more general concept that includes facial rejuvenation, it plans for the use of small doses of botulinum toxin on a regular basis.

This use of botulinum toxin into the nasal muscles is an approach that should be considered complementary to the use of a filler.

The contraindications

Fillers

The contraindications related to the particular product and any technical information produced by the manufacturer should be noted. The author never uses a permanent filler and avoids those that are not hyaluronic acid-based. In addition, it is necessary to respect the



Figure 11 The author recommends injecting at three different sites of the nose. (A) each elevator muscle of lip and nasal wing, parallel to the nasal wing; (B) at the nasal point; (C) at the level of the nasal spine



Case example one Primary rhinoplasty with camouflage filling (HA) of the hump and nasal tip over projection. (A) Before, and (B) after treatment

contraindications specific to hyaluronic acid, such as the risk of cutaneous infection, and avoidance during pregnancy^{6,7}.

The psychological dimensions of nasal modification must always be taken into account. Contraindications are directly related to the psychological and artistic analysis before therapy, and in certain cases, only the



Case example two Secondary rhinoplasty The patient has been operated on, and there is a residual hump (A). The medical treatment consist with HA injection (up and down) to hide the hump (B).

surgery will allow an adapted result, particularly in reduction rhinoplasty.

Botulinum toxin

Contraindications to the use of botulinum toxin are allergy to the drug and infection or inflammation at the proposed injection site(s)^{9,10}. Safety for use during pregnancy or lactation has not yet been established. Therefore, it is prudent to avoid botulinum toxin therapy for elective procedures in women of childbearing age until absence of pregnancy or adequate contraception is assured. Relative contraindications include diseases of neuromuscular transmission, coagulopathy (including therapeutic anticoagulation), and inability of the patient to cooperate. In the more complex disorders, botulinum toxin therapy should not be used unless a skilled interdisciplinary team and sophisticated instrumentation are available to ensure valid diagnosis, state-of-the-art treatment, and appropriate follow-up^{9,10}. The physician administering this drug should be trained in its use and qualified to manage any complications.

Conclusions

The soft rhinoplasty, or mini-rhinoplasty, is a very basic way in which to correct the nose in both safe and modern conditions. Medical rhinoplasty is a newer, minimally-invasive procedure, which is also temporary

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but with impressive outcomes. It is a remarkable procedure which provides surprising results with a stability greater than that of treatments to other parts of the face.

For both procedures, technical training is paramount, and an artistic approach to the indications is necessary.

Declaration of interest none

