Reshaping the Nose With Injectable Agents

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Reshaping and repositioning of the nose are now possible without the use of invasive surgical procedures. Advances in the uses of botulinum toxins and soft-tissue augmentation products have resulted in the ability to minimize the degree to which surgery is required to cosmetically improve the appearance of the nose and potentially to avoid surgery entirely.

According to the American Society for Aesthetic Plastic Surgery, more than 166,000 people had rhinoplasties in 2004.[1] This fact speaks toward the primacy of the nose in the appearance and self-esteem of many people. Although physicians have explored the use of fillers and botulinum toxins for nonsurgical nasal remodeling, there are surprisingly few publications in the dermatology literature regarding the anatomy and technical considerations of the nasal musculature as it relates to nonsurgical nasal remodeling. This review will discuss anatomic and technical considerations for the use of botulinum toxins in the nose.

PRINCIPLES OF NONSURGICAL NASAL RECONSTRUCTION

Despite the misperception by many patients and physicians that the nose is a static, bony structure, it is invested with several muscles that affect its shape and position. These muscles, although well known to physicians who inject botulinum toxin type A on a regular basis, are infrequently injected, even by advanced injectors. Muscles that affect the appearance of the nose include the procerus, the levator labii superioris alaeque nasi, the dilator naris, the depressor septi nasi, and the nasalis (Figure 1). These muscles affect the root of the nose, the nasal sidewall, and the nasal tip; it is worthwhile to consider the anatomy of this area before discussing techniques to alter it.

The nasalis originates on the maxilla in the region of the lateral incisor and inserts into the greater nasal cartilage. There are 2 parts to the nasalis muscle, the alar part (dilator naris) and the transverse part (compressor naris). The alar part acts to draw the ala inferiorly and flare the nostrils. The transverse part, as the name suggests, compresses the nasal aperture. The depressor septi nasi arises from the incisor region of the maxilla and inserts into the cartilaginous nasal septum. It serves to depress the cartilaginous portion of the nose as well as to constrict the nostrils. The levator labii superioris alaeque nasi begins at the upper part of the frontal process of the maxilla and bifurcates to insert onto the greater alar cartilage of the nose and the skin over it. The lateral slip inserts into the dermis at the upper part of the nasolabial furrow and ridge. This muscle elevates the upper lip and dilates the nostrils. The procerus originates from the nasal bone and the lateral nasal cartilage. It inserts into skin overlying the bridge of the nose. This muscle is responsible for producing the transverse wrinkles over the bridge of the nose that are commonly referred to as "bunny lines."

Botulinum toxins may be used to treat nasal ptosis when injected into the muscles that depress the nose. This will allow the nasal elevators to raise the tip of the nose, thereby providing a more cosmetically acceptable appearance. Several authors, including Atamoros,[2] have reported excellent outcomes from injections of the alar portion of the nasalis and depressor septi nasi with botulinum toxin type A. Dosages used by this author were 2 to 6 units for each side of the alar portion of the nasalis

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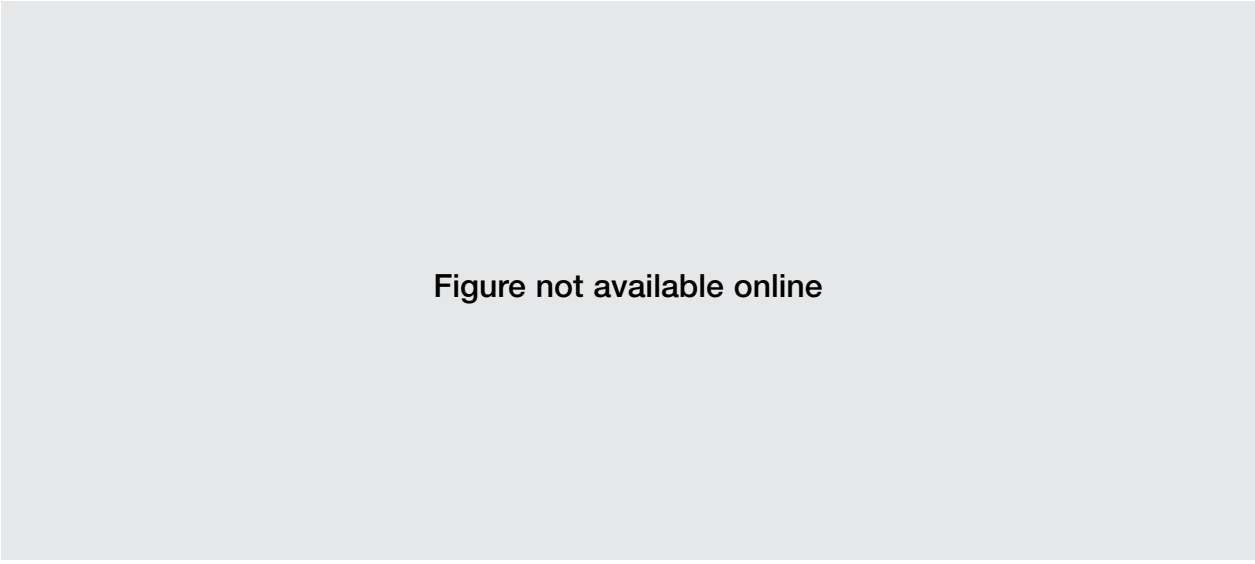

Figure 1. Muscles affecting the shape of the nose. Illustration by Dorling Kindersley.

and 2 to 6 units injected into the depressor septi nasi (Figure 2). Botulinum toxin type A may be injected into the dilator or alar nasalis to treat nasal flaring.

Some individuals have dynamic nasal-tip ptosis accompanied by a short, curling upper lip that is exaggerated by smiling. To ameliorate this dynamic nasal-tip ptosis, injections may be made into the depressor septi nasi and levator labii superioris alaeque nasi. As discussed by Dayan and Kempiners,[3] the downward pull of the depressor septi nasi muscle may be countered with 5 units of botulinum toxin type A placed in each of these paired muscles. An additional 3 units injected into the levator labii superioris alaeque nasi on each side is also helpful. The authors recommend beginning these injections with lower doses of 1 to 2 units to see the effect before treating with a full dose. Countering the downward vectors of these depressor muscles can restore the nose to a more cosmetically acceptable superior position.

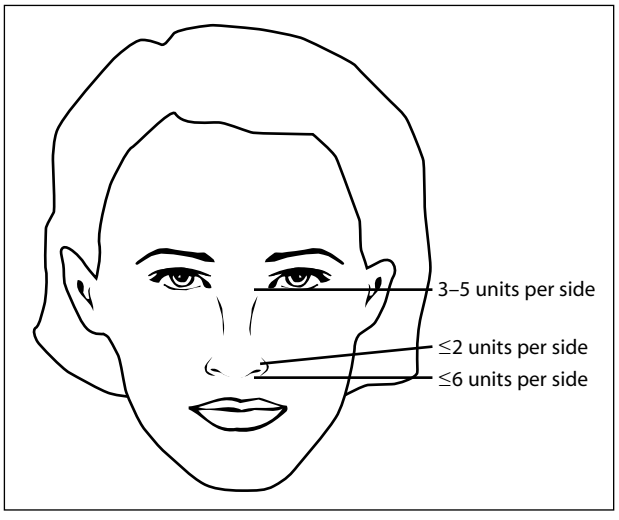

Figure 2. Injection sites for treatment of depressor septi nasi and alar portion of nasalis and for treatment of procerus.

Bunny lines are a frequent source of concern for patients, particularly after they obtain smooth glabellar areas following treatment of the latter site with botulinum toxin type A. These lines are typically caused by the nasalis muscle and are easily ameliorated. To treat these rhytides, the lateral aspect of the nasal sidewall is injected with 3 to 5 units of botulinum toxin type A (Figure 2). Care must be taken to avoid injections into the nasolabial sulcus, which may result in unintended treatment of the levator labii superioris alaeque nasi.

At the root of the nose lies the procerus, a muscle frequently treated during injection of the glabellar complex. Contractions of this muscle contribute to transverse ridging at the superior aspect of the nose. This is easily treated with 4 to 7 units of botulinum toxin type A placed in the manner described by Tamura et al.[4] In some patients, the static component of these rhytides must be addressed with fillers such as hyaluronic acid or collagen, which may make a dramatic difference when used correctly (Figure 3).

The use of botulinum toxins for the treatment of various nasal imperfections offers a safe and effective alternative to surgical revision. Fillers such as hyaluronic acid, polymethylmethacrylate, and calcium hydroxylapatite provide further opportunities to nonsurgically reshape the appearance of the nose.

In some patients, the use of botulinum toxins may not be sufficient to reshape the nose. In such cases, the addition of soft-tissue augmentation products to botulinum toxins may help remodel without surgery (Figure 3). Patients

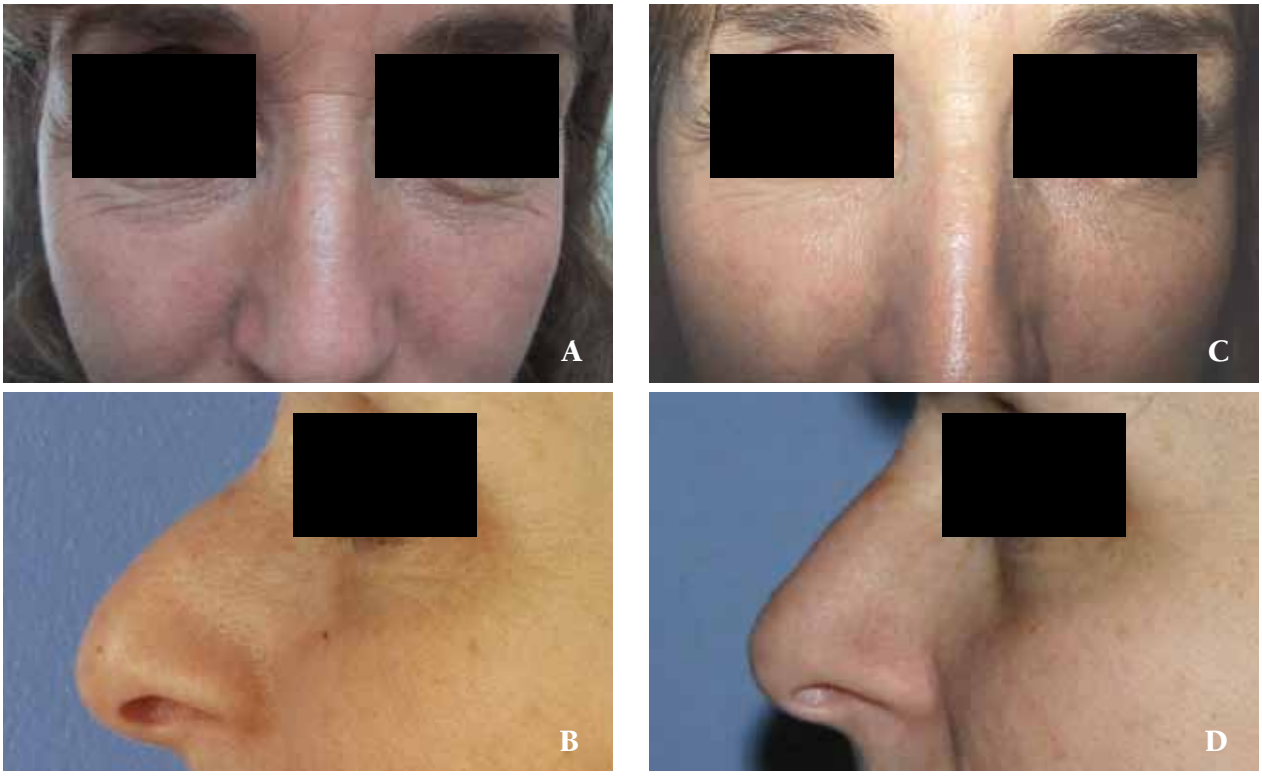

Figure 3. Subjects' noses before (A, B) and after (C, D) injections of botulinum toxin type A and filler.

with an unwanted dorsal hump can have its appearance minimized with injections of a filler adjacent to the hump. Small amounts of hyaluronic acid or calcium hydroxylapatite injected on both sides of the hump can restore a more even profile to the nose. This may be performed in conjunction with injections of botulinum toxin type A to decrease the muscular vectors to the undesired shape.

Volume may be added to the nasal root and, occasionally, the nasal tip to make the nasal profile more symmetric and even. Extra volume can be given at the anterior nasal spine and columella. This will help open the nasolabial angle to elevate the nasal tip. Injections into the nasal root and around the nasal spine should be at the level just above the periosteum.

If surgical rhinoplasty or trauma has produced depressions, treatment with fillers, including silicone, calcium hydroxylapatite, and hyaluronic acid, can improve the appearance. In many instances, the addition of these fillers can completely resolve the defect and markedly improve the appearance of the nose (Figure 4). This alternative is an attractive opportunity for patients seeking aesthetic improvement but who are reluctant to undergo a surgical revision.

CONCLUSION

Patient selection is critical when considering performing nasal correction with fillers and botulinum toxin type A. Patients with significant muscular contributions

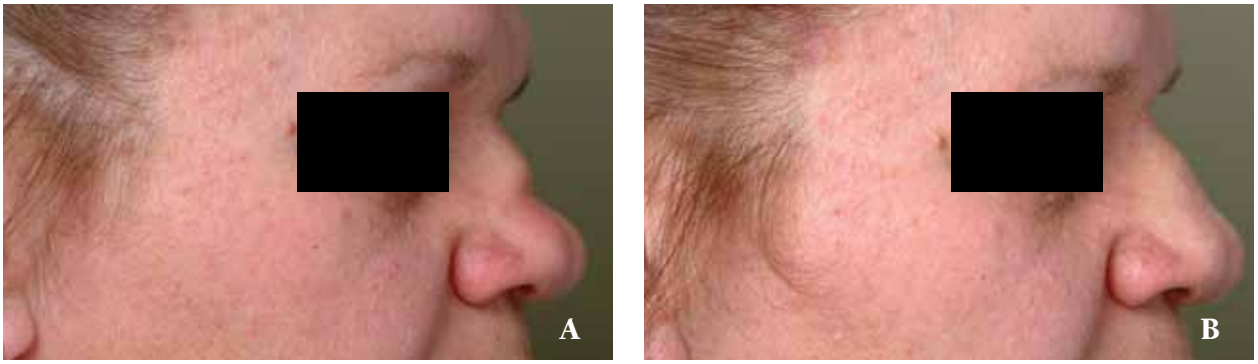

Figure 4. Subject's nose before (A) and after (B) injection of Restylane®.

to their nasal shape and with distensible skin in the areas to be injected will have the greatest probability of achieving the best outcomes. Patients with a history of multiple rhinoplasties may have compromised vascular status of the nose because of scar tissue. Injections of fillers should be performed in a conservative manner in these individuals. Injections of significant volume may exert considerable pressure on the skin and compromise underlying vasculature, resulting in necrosis of the skin. As with any injections, mild erythema, swelling, and discomfort are common side effects of injections of botulinum toxin type A and fillers into the nose.

The use of botulinum toxins alone or with fillers can help reshape and improve the cosmetic appearance of the nose without surgical intervention. They can also be used postsurgery to enhance results or improve unwanted sequelae.

REFERENCES

1. The American Society for Aesthetic Plastic Surgery 2004 Cosmetic Surgery National Data Bank: Statistics. Available at: http://www.surgery.org/download/2004-stats.pdf. Accessed November 2, 2006.
2. Atamoros FP. Botulinum toxin in the lower one third of the face. *Clin Dermatol.* 2003;21:505-512.
3. Dayan SH, Kempiners JJ. Treatment of the lower third of the nose and dynamic nasal tip ptosis with Botox. *Plast Reconstr Surg.* 2005;115:1784-1785.
4. Tamura BM, Odo MY, Chang B, et al. Treatment of nasal wrinkles with botulinum toxin. *Dermatol Surg.* 2005;31:271-275. ■