

Surgical procedures to improve esthetics when orthognathic surgery is not an option

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Orthodontists are generally not very familiar with the basics of facial plastic surgery and what procedures are available to enhance the appearance of our patients. Why would an orthodontist think about recommending soft tissue surgery in orthodontic cases? We suggest that soft tissue procedures might be considered for orthodontic

patients for the following reasons:

1. When the occlusal goals of orthodontic treatment are attained, but the facial treatment goals are not.
2. When orthognathic surgery is the best choice of treatment but unavailable because of patient choice or insurance reasons.
3. When orthodontic treatment results in undesirable facial changes.
4. When the cosmetic outcome can be enhanced, either for the immediate benefit or to counter the effects of aging.

For ideal nasal proportions, the alar bases on the frontal view should generally be coincident with the width of the inner canthus of the eyes. On profile, the nasal dorsum should be fairly straight; the junction of the dorsal cartilage and the nasal tip cartilage above the

nasal tip forms the *supratip break*. This continues into the nasal tip, into another defined break below the nasal tip and above the columella and is termed the *infratip break*. On the oblique view, there should be a smooth symmetrical transition of the eyebrows into the dorsum and into the alar base. The alar base and the nasal tip should be joined by distinct anatomy called the *scroll* because of its S-shape, like a scroll.

Rhinoplasty can be performed with an open or a closed approach. In the closed approach, access to the skeletal and cartilage structures of the nose is through an intranasal incision inside the rim, or nares, of the nose. With this approach, septal surgery, hump removal, dorsal osteotomies, tip plasty, and alar base resection can all be performed. In the open approach, an incision is made in the columella and the nose reflected to reveal its entire osseous and cartilage structures. In both techniques, reduction of the dorsal hump is done with an osteotome, and a rasp is used to trim the edges of the osteotomy. The osteotome is also used to fracture the lateral borders of the nasal bone to permit narrowing and reshaping. The nasal tip cartilages can be "delivered" externally for trimming and reshaping, and are subsequently sutured transseptally to narrow the nasal tip and reduce its projection. In some cases, cartilage is harvested from the nasal septum to serve as augmentation material and struts for tip support.

In this article, we will present the indications for rhinoplasty in nonorthognathic treatment.

Occlusal goals met but facial goal not met

The patient in Figure 1 came for treatment at age 11.5 for correction of her Class II malocclusion. She had a moderate mandibular deficiency with some facial convexity, and the orthodontic plan was designed to correct the Class II relationship by improving the projection of the mandible. After orthodontic treatment, the malocclusion was successfully corrected, but her profile was only moderately improved. Nasal growth during her treatment contributed to an increase in facial convexity (Fig 1, B). After a follow-up conference with the patient and her parents at age 15, treatment was recommended to include rhinoplasty to reduce the

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Fig 1. A, Girl at age 11.5 had Class II malocclusion due to moderate mandibular deficiency. Orthodontic treatment was planned to improve projection of mandible. **B,** By age 14, her malocclusion was corrected, but profile was only moderately improved. Nasal growth during treatment contributed to increase in facial convexity.

dorsal hump and nasal tip refinement, and an inferior border osteotomy to advance the chin to improve facial convexity.

In this patient, on profile, dorsal hump reduction and nasal tip resection were planned to reduce projection. Frontally, the dorsal osteotomies needed to correct the dorsal hump also narrowed the dorsum and produced the desired continuous transition from the brow to the tip. The nasal tip surgery refined the nasal tip by narrowing its width. Figure 2 shows the profile after rhinoplasty and inferior border osteotomy, and the oblique smile view shows the elegance of the final result.

To enhance the esthetics of orthodontic treatment and when orthognathic surgery is not an option

Many patients seeking orthodontic treatment have significant skeletal deformities that, in order to correct the dental and skeletal relationships, require a combined orthodontic and orthognathic approach. But the patient might not want orthodontic treatment or orthognathic surgery but does want esthetic facial enhancement. In these circumstances, the facial plastic surgeon can make significant improvements in the facial appearance with soft tissue procedures and by camouflaging the skeletal deformities with facial contouring achieved through procedures such as midface and paranasal implant augmentation of the facial skeleton. The trend

in plastic surgery today is more toward augmentation of both hard and soft tissues than to remove tissue to reverse the aging process. Areas often augmented include the border of the mandible, the parasymphysis, and the suborbital and cheek areas.

Implant materials in contemporary plastic surgery include silastic implants, Mersilene mesh (Ethicon, Somerville, NJ), and Gortex (W. L. Gore & Associates, Flagstaff, Ariz). Although silastic implants have received much negative publicity in chin augmentation because of their tendency to result in resorption of the anterior border of the mandible, these forms of implants are quite useful in nonload-bearing areas. Other materials also serve quite adequately as implants on the chin.

To enhance the esthetics of orthodontic treatment in relation to aging

Characteristics of the aging face include loss of skeletal and dental support of the midfacial soft tissues, and changes in tissue tone and fat deposition. Of specific interest to orthodontists are the aging characteristics of the lips. Attractive lips are characterized by a diamond shape and an upper vermilion border that forms an "m," in which the 2 peaks correspond to the philtral ridges. The central portion of the upper lip protrudes downward, forming the tubercle of the lip. The junction line of the lips also forms an "m" that is



Fig 2. A, Girl at age 16. Nasal tip was surgically narrowed and elevated. Width of base of nose and nasal dorsum fit face better. **B**, Convexity of profile was improved after rhinoplasty (dorsal projection and overall nasal projection were reduced) and inferior border osteotomy to advance chin.

parallel but not as marked as that of the upper vermillion. Frontally, the lower lip generally is bulkier than the upper lip.

With advancing age or premature aging, the lips show 3 types of change¹:

1. Atrophy that is more pronounced in the upper lip than the lower lip. Both lips tend to thin out and lose their peaks, and the "m" flattens out.
2. Inversion with loss of vermillion display.
3. Elongation: the nasolabial complex rotates clockwise, and the upper lip becomes more inferiorly positioned.

Soft tissue surgery to enhance the appearance of the lips includes both augmentation and soft tissue advancement of the vermillion.² The *lip lift* procedure can be performed through a direct incision on the vermillion borders of the lips. A new vermillion border is outlined, and the tissue between the outline and the existing vermillion is excised. The edges of the incisions are sutured together; this elevates the superior border of the upper lip. *Lip augmentation* can increase the bulk of the lips; several materials are available for augmentation, including collagen injection and implants. Alloderm

(human dermis in sheet form) (Life Cell, Somerville, NJ) is an excellent implant material. Through small incisions at each oral commissure, a submucosal tunnel is created connecting the 2 incisions. An Alloderm sheet is rolled into a tube to the desired diameter, passed through the tunnel from end to end, and cut to length. The incisions are then closed. The advantages of Alloderm are that it is easy to obtain, well tolerated, and soft to palpation—a very important characteristic in lip augmentation.

In the comprehensive approach to treatment planning, esthetic soft tissue surgery as an adjunctive treatment in orthodontics can greatly enhance the final outcome. A greater knowledge of the available procedures and techniques also permits the orthodontist to better counsel patients about what to consider in attaining their esthetic goals.

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