Surgical Alar Base Management With a Personal Technique

The Tightening Alar Base Suture

Dario Bertossi, MD; Massimo Albanese, MD; Luciano Malchiodi, MD; Pasquale Procacci, MD; Pier Francesco Nocini, MD

Objective: To evaluate the aesthetic result in the nasal base, when sutured using a personal technique, in patients undergoing bimaxillary surgery.

Design: Review of 60 cases in which the alar base suture was used during bimaxillary surgery with an average maxillary advancement of 3.5 mm. The patients were measured on cutaneous points and on side view with cephalometric soft-tissue measurements.

Result: The technique of cross-suturing the alar base provided good control on the involuntary movements of the alars that result from maxillary advancement. The frontal view of the patient before and after surgery revealed that good tightening of the nasal base was obtained despite the upper jaw movements. Long-term results appear to be stable.

Conclusion: This personal technique of nasal alar suturing during bimaxillary surgery appears to be effective in avoiding unaesthetic deformities of the nasal base as well as providing good facial harmony.

Arch Facial Plast Surg. 2007;9(4):248-251

THE EFFECT OF BIMAXILLARY surgery on facial aesthetics has been the subject of several studies. Improving facial harmony and the functional benefits appear to be strong motivating factors for patients who decide to undergo orthognathic surgery. Some authors have observed a remarkable anatomic-morphologic relationship between hard and soft tissues. The diversity of the structures involved and the variability of possible surgical treatments make it difficult to accurately imagine the outcome of the soft tissue.

The nose, chin, and malar regions are the keystones of facial aesthetics and they have to be accurately evaluated in planning and performing facial osteotomies while taking into account unpredictable changes. Bony movements during facial surgery have an effect on the soft-tissue envelope; each surgical procedure has a different cosmetic effect.

To maximize surgical benefits and improve patient satisfaction, the surgeon should aim for long-term follow-up and the possibility of performing minor adjunctive procedures to obtain a good result. With good knowledge of soft-tissue response and the control of muscle repositioning, the aesthetic result can be more consistent and predictable, leading the patient and the surgeon to a more satisfactory outcome. Maxillary osteotomies and modification of the nasal aesthetics and upper lip shape typically involve the alar base width and aspect, the nasolabial angle, the position of the upper lip and nasal tip, and the supratip area. These modifications are mainly associated with maxillary movements, extension of subperiosteal and musculature dissection, and management of the muscle repositioning during suturing.1 Widening of the alar base is an undesirable effect in most cases. According to Schendel and Carlotti,2 widening of the alar base can be partially related to the maxillary bone movements. According to Betts et al,3 this widening ranges between 6% and 10%. To reduce this undesirable effect, some surgical modifications, such as alar base suturing, have been described4-5 with controversial results. We present herein a new personal technique of alar base suturing in patients undergoing bimaxillary surgery.

METHODS

PATIENTS

From November 1999 to January 2005, 60 patients had undergone bimaxillary surgery. Average age of the patients was 27 years. Preop-
operative evaluation included a standardized cephalometric radiograph, panoramic radiograph, and frontal and profile photographs of the patient. In all cases, mainly a maxillary advancement procedure was performed, with an average forward movement of 3.5 mm. Intraoperative measurements were taken on the alar base insertion to restore the ideal anatomic and aesthetic positioning of this region. A postoperative evaluation similar to the preoperative one was performed.

SURGICAL TECHNIQUE

The surgical technique of alar base suturing is performed before applying the final suture. It consists of a 3-0 polyglactin cross-suture from the alar base, across the transverse nasalis muscles, to the contralateral side, fixing the suture to the sectioned contralateral muscle, with the insertion on the adherent side of the gingiva, just above the canine teeth. The tightening of the suture is clinically controlled with the distance between the 2 alars measured before surgery. This technique of suturing is always added with a double V-Y closure of the anterior portion of the circumvestibular approach for the Le Fort I osteotomy (Figure 1 and Figure 2).

PATIENT REPORT

A 24-year-old woman was admitted with a class 3 malocclusion, with retrusion of the middle third of the face, zygomatic hypoplasia, and an open nasolabial angle (Figure 3 and Figure 4). She underwent bimaxillary surgery with a maxillary advancement of 4.5 mm, and bilateral mandibular osteotomies to move the lower jaw back in relation to the new position of the maxilla. Rigid fixation of the osteotomies was corrected by placing a bilateral malar prosthesis (Medpore, Porex Surgical, Newman, Georgia) fixed to the bone with microscrews.

The nasal alar base was sutured using our technique. The transverse nasalis muscles were correctly repositioned to preserve their physiologic motion and provide good aesthetic balance to the result. The nasolabial angle was reduced to normal value, unaesthetic widening of the alar base was avoided, and involuntary upward tipping of the nose was not observed. Upper lip exposure was increased. Long-term result appeared to be stable when smiling and otherwise (Figure 5 and Figure 6).

RESULTS

We were able to perform the new suturing technique on all 60 patients selected. A slight overcorrection of 1 to 2 mm was applied to account for any possible swelling of the upper lip. The nasal base was restored well in all cases, with an improvement seen in the aesthetic projection of the upper lip filtrum and normalization of the nasolabial angle. Upper lip movements, smiling, and facial mimics of the nasal region appeared not to be affected by the suturing, but showed a good restoration of the physiologic motion of the involved muscles. Long-term results, up to 12 months after surgery, included a nonsignificant relapse of the suturing, leading us to consider the result stable.

COMMENT

Changes in nasal aesthetics after Le Fort I osteotomies have been reported by many authors. Typically, there
is widening of the base of the nose and associated flattening and thinning of the upper lip, visible in loss of the external vermilion border. The most striking aspect of these studies is the extreme variability in the nasolabial response to the Le Fort I procedures. The soft-tissue response is related in part to the amount and direction of the maxillary movement, quality and quantity of soft tissues, treatment of nasal crest of the maxilla, and management of soft tissue during the wound closure. Nasal widening is only partially dependent on the amount of skeletal movement. Most important is the amount of subperiosteal dissection and elevation accomplished. The facial muscles become detached from the nasolabial area and the anterior nasal spine, making the outcome frequently asymmetric and unpredictable. Therefore, secondary rhinoplasty often becomes necessary after a period of 6 to 12 months following bimaxillary surgery. Nevertheless, the secondary effect on nasal aesthetics induced by Le Fort I osteotomy needs to be minimized whenever possible during the first operation: controlling the widening of the alar base is one of the major aspects. Some authors assessed the concept of combining orthognathic correction and cosmetic surgery as a 1-stage procedure. They also proposed combining mandible orthognathic surgery with a full rhinoplasty. When performed by a surgeon with sufficient experience, these procedures can be combined without any difficulty other than lengthening the total operation time. Our proposed suture, with its cross-linking and fixation to an attached gingiva, appears to control the induced movements of the alar base well, while providing reliable long-term results. The direction of the sutures induces a similar re-fixation to the previous position of the transverse nasalis muscles, which are stripped of their osseous attachments during the Le Fort I osteotomies. Furthermore, there is a pulling out effect on the philtrum area (Figures 1 and 2), thereby giving a more physiologic effect to facial movements when the patient is smiling. This method is more likely to avoid a secondary rhinoplasty because of involuntary and unaesthetic nasolabial changes after orthognathic surgery.

**CONCLUSIONS**

Orthognathic surgery is mainly performed to achieve optimal masticatory function. Nevertheless, it is accompanied by aesthetic improvements as a consequence of the restored relationship of the basal bone segments. Because soft tissues react directly to the modification of the bony structure, these movements need to be evaluated before and during surgery to avoid unexpected results. The modification of the nasal alar base that occurs because of anterior movements of the maxillary jaw dur-

![Figure 4. Lateral view of the patient before surgery.](image)

![Figure 5. Frontal view of the patient 1 year after surgery.](image)
The anterior repositioning of the upper jaw always leads to an unaesthetic opening of the nasal alar base. This inconvenience is usually avoided when performing a bone recontouring of the pyriform structures and a shortening of the nasal spine. Authors suggest an additional remodeling of this area by performing a cross long-term resorbable suture of the nasal alar to the anterior part of the attached gingiva above the lateral incisal teeth (the tightening alar base suture). We evaluated 60 patients undergoing bimaxillary surgery using this technique. The average maxillary advancement was about 3.5 mm. The technique of suturing the nasal alar was found to provide good control on the involuntary movements of the alar that occur because of the maxillary advancement. The frontal view of patients before and after surgery revealed good tightening of the nasal base despite the upper jaw movements. Long-term results appear to be stable after 5 years' follow-up.

Accepted for Publication: February 28, 2007.
Correspondence: Dario Bertossi, MD, Dentistry and Maxillofacial Surgery Section, Department of Morphological-Biomedical Sciences, University of Verona, Policlinico G. B. Rossi piazzale L. Scuro 37134, Verona, Italy (dario.bertossi@univr.it).
Financial Disclosure: None reported.
Author Contributions: Study concept and design: Bertossi. Acquisition of data: Bertossi and Procacci. Drafting of the manuscript: Procacci. Critical revision of the manuscript for important intellectual content: Malchiodi and Nocini. Statistical analysis: Bertossi and Nocini. Administrative, technical, and material support: Procacci. Study supervision: Bertossi.

REFERENCES