

Unilateral Osteotomies for External Bony Deviation

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Objective: Deviated nose is a challenge for rhinoplasty surgeons. We applied a new technique to correct nasal bone asymmetry in selected patients. We assessed the efficacy of the technique and discussed the surgical outcomes.

Methods: We retrospectively analyzed 29 patients with deviated nose who received unilateral osteotomy alone or unilateral osteotomy with camouflage graft placement to the other side of the nose. Preoperative and postoperative photographs were studied to evaluate the outcomes.

Results: Twenty-nine unilateral osteotomies were done. Camouflage grafting was performed to 20 of the 29 patients. Nasal humps were removed in all patients. No postoperative complications occurred during the follow-up period. Twenty-six of 29 deviated noses were corrected with unilateral osteotomy.

Conclusions: The unilateral osteotomy technique seems to be a useful method for correcting deviated nose.

Key Words: Deviated nose, crooked nose, unilateral osteotomy, camouflage grafts

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Deviated nose is a term used to describe the deviation of the nasal pyramid from the midline of the face. Despite the many methods applied for correction of the deviated nose, it continues to be one of the most challenging problems in rhinoplasty. Although there are many techniques devised for that purpose, the recurrence rate of nasal deviation after surgery is still high.¹ Most deviated noses, at the end of a regular rhinoplasty, seem well positioned in the midline. However, the nasal pyramid may begin to migrate to its old position soon. It is important to produce septum, nasal bone, and tip straight individually. There are some techniques to manage nasal bone asymmetry, which are asymmetric osteotomy, double osteotomy, and wedge resection. We performed unilateral osteotomy to one side and camouflage graft placement to the other side of the nose to correct nasal bone asymmetry in selected patients. The current study examined the usefulness of this technique for deviated noses with nasal bone asymmetry.

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MATERIALS AND METHODS

We retrospectively reviewed 29 select patients with nasal obstruction and external deformity who received unilateral osteotomy technique and camouflage graft placement to the other side between July 2005 and January 2009. The collected data were performed procedure, follow-up time, complications, need for revision surgery, and cosmetic outcomes that were determined by the senior author and independent 2 observers who reviewed preoperative and postoperative photographs. Results after a minimum of 1-year follow-up were reviewed and evaluated as successful if dorsum of the nose returned to the exact nasal midline with symmetry.

Frontal photographs were used for the evaluation of the nasal symmetry. The reference point in anteroposterior view is the facial center point lying halfway in between the medial cantus on the nose with the head in the Frankfurt position. Nasal asymmetry is assessed using a midline vertical line that intercepts the glabella, the nasal septum, the nasal dorsum, the nasal tip, the columella base, and the philtrum. Noses deviated from that line were accepted as deformed noses. All the nasal bones were deviated from the median line. Deformities were not classified as C or S. Only the nasal asymmetry was taken into account. External rhinoplasty was performed in all patients. Each unit (tip, septum, and nasal bone) was analyzed and planned individually. Decisions about the osteotomy and which side it should be done were based on the X point. The X point was described as the widest point of the nose at the level of the maxilla.² Osteotomy was not performed if the straight line from the medial cantus to the inferior crossed the X point or if the X point were medial to that line.

In deformed noses, if the line from the medial cantus crossed the X point, nasal bone was accepted as in place at that side, and osteotomy was not performed. However, unilateral osteotomy was performed to the other side (Fig. 1).

If the X point did not cross the line from the medial cantus and stayed in that line, a camouflage graft was put to fill and support that side, and unilateral osteotomy was performed to the other side. If the cephalic resection material was enough to use as camouflage graft, then it was used as the first choice. If it was not enough,

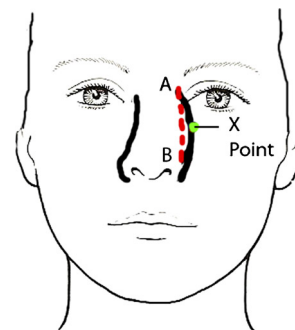


FIGURE 1. X point: Widest point of the nose at the level of the maxilla. A, B, Straight line from the medial cantus to the inferior crossed.

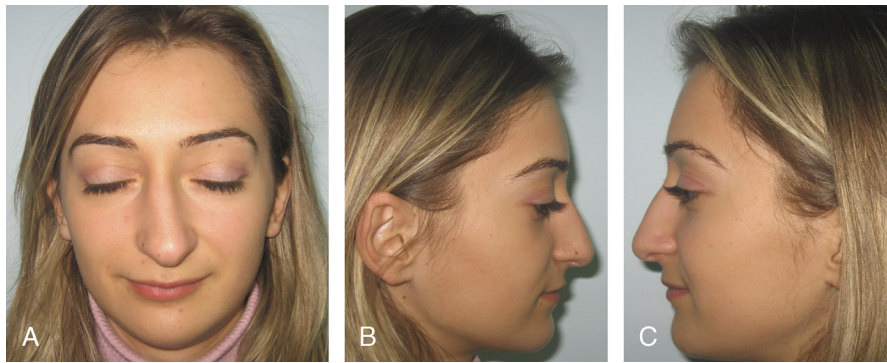


FIGURE 2. A–C, Preoperative appearance of the first patient before rhinoplasty.

then septal cartilage and vomer would be the choice as crushed cartilage graft.

Surgical Technique

After the patients received a general anesthetic, the X points were localized before performing injection. Midcolumnar reverse V incisions were made after the injections. Nasal humps were removed after the skin was elevated. A camouflage graft was used to close the open roof if it was needed. After that, septum was fixed by total septal reconstruction, spreader graft, asymmetric spreader graft, and scoring. Medial osteotomy was first performed to the side planned for the osteotomy. Medial osteotomy has been performed externally with a 2-mm osteotome. After that, lateral low to low osteotomy was performed inside the nose with a 4-mm guarded osteotome.

A tunnel was performed just 0.5 cm anterior to the nasal bone, and the camouflage graft was let into the nose from the apertura piriformis. Suture was not used for the graft stabilization. Tip-plasty was done at the end. For the tip asymmetry suture techniques, dome division and tip grafts were used. The dressings were made with the silastic splints internally, followed by a tape dressing and cast externally.

The clinical evaluation was made by inspection, palpation, photographic documentation, and functional analysis every 6 months for the first year and once a year thereafter.

RESULTS

This study includes 29 patients with deviated nose: 14 males (48%) and 15 females (51%). Ages ranged from 17 to 37 years (median age, 27 y). Twenty-eight of the 29 cases were primary. All patients had deviated nose caused by trauma. Follow-ups ranged

from 12 to 36 months after surgery with a mean follow-up period of 18 months. Camouflage grafting was performed to 20 of the 29 patients. In 20 patients with camouflage grafts, alar cartilage cephalic resection material was used in 11, and septal cartilage and vomer were used in 9 patients as a graft material.

The closure of the roof after dorsal hump removal was also completed in all patients. No postoperative complications occurred during the follow-up period. No case of extensive hemorrhage or prolonged edema was encountered. In 2 patients with camouflage grafts, owing to the large graft size, graft was palpable and visible at sixth postoperative month. Trimming was performed under local anesthesia to those 2 patients. In other patients, no absorptions were detected during the follow-ups. The airway obstruction was corrected in all patients. Twenty-six of the 29 deviated noses were corrected with unilateral osteotomy (Figs. 2A–C to 5A–C).

DISCUSSION

In deviated nose, nasal pyramid varies from the straight vertical orientation of the face. The anatomic basis of the deviation may be related to bony pyramid abnormality, septal deformity, or a combination of the 2. The cause may be congenital or acquired secondary to previous trauma or surgery. Successful management of the deviated nose deformity requires accurate preoperative diagnosis, knowledge of the structural anatomy of the nose, and awareness of any long-term consequences of different surgical techniques. Deviated segments of the nose are usually shifted back to the midline by manipulating cartilage, performing osteotomies, or realigning other structural attachments. However, nasal structures cannot be altered in a way that will compromise major nasal support structures. Absolute correction of the deviated nose is difficult because

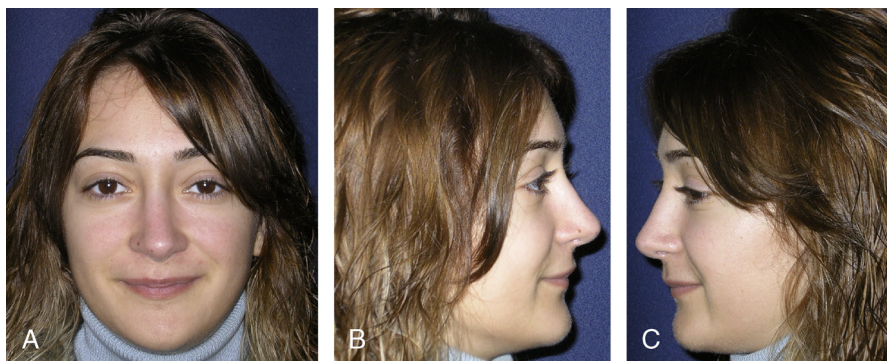


FIGURE 3. A–C, Postoperative appearance of the first patient after unilateral osteotomy.

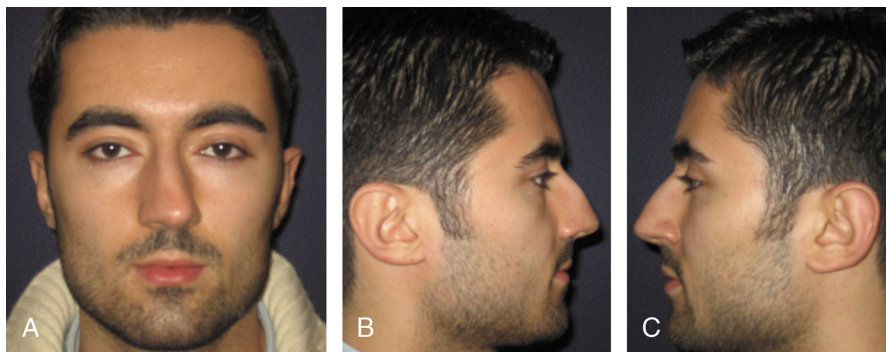


FIGURE 4. A–C, Preoperative appearance of the second patient before rhinoplasty.

of the complexity of the structural defect and the highly visible, well-defined subunits of the nasal dorsum. For example, the nasal structure may be aligned in the midline, but the nose may appear deviated because of a residual concavity or convexity along one of the borders of the dorsal nasal subunit. Ideally, a contour line created in part by shadows extends from the brow and dorsal nasal subunit to the tip-defining point. Any break or deviation of the dorsal nasal contour line may give the nose a deviated or irregular appearance. Absolute correction of the deviated nose deformity will require the surgeon to become familiar with conventional methods (septoplasty, osteotomies, grafting, etc) and to be able to improvise when encountering variant nasal anatomy.^{1,3}

Traditional methods of performing osteotomies rely on making low, symmetric lateral bony cuts along the nasal process of each maxilla, regardless of whether they are performed percutaneously (perforated) or transnasally (continuous). Although effective at narrowing a wide bony base, these techniques often do not adequately correct asymmetry of the bony nasal vault when the deviation occurs either centrally or higher along the nasal sidewall because of malposition of the nasal bone. Thus, restoring a symmetric bony nasal vault configuration in these instances requires a modification of current techniques. Rhinoplasty with a lateral osteotomy performed on both sides is often successful in moving the nasal pyramid to the midline on the operating table. Later on, it moves to its old position owing to the memory of the soft nasal tissue. Soft tissue attachments—nasal skin, mucous membrane, and periosteum—tend to retain their original deviation. Care should be taken to avoid excessively freeing the periosteum of the nasal bones in lateral osteotomies because comminution can result from multiple osteotomies and the periosteum can prevent the displacement of

these comminuted fragments. This increases the possibility of the deviation recurrence.

If the nasal bone is deviated, asymmetric osteotomy, asymmetric hump resection, double osteotomy, oblique osteotomy, and lateral osteotomy are used.⁴ Lateral osteotomy, if performed alone, causes the nasal dorsum to slide to the other side. In some cases of external nasal deviation, performing unilateral osteotomy on the deviated side while keeping 1 side of the bony pyramid unfractured is an alternative technique that avoids intrinsic destabilization of the bony framework.^{5,6} In these techniques, the aim is to separate the nasal structures and remodel, which is not easy in deviated noses, resulting in high complication rates and inadequate postoperative outcomes. Wedge resections and double osteotomies, which are used to straighten the bone deviation, are destructive techniques.

In posttraumatic bony deviation, malformed nasal bony segments are repositioned en bloc without correcting the configurations of malformed segments. When conventional osteotomy techniques are performed, comminuted fractures, middle vault, and nasal bone collapse might develop in traumatic nose. Furthermore, nasal bone on the trauma side could move to facial midline after trauma owing to fractures as if osteotomy was performed. Therefore, if the X point resides medial to the straight line drawn from the medial canthus, there is no need to perform osteotomy.

Although mobilization and reduction by incomplete osteotomies may correct deviation initially, subsequent contraction of fibrous tissue may result in recurrence of the deformity. Based on the results of this study, we believe that the unilateral osteotomy technique allows optimal results to be obtained for the correction of the deviation of the bony pyramid. Complications associated with bilateral osteotomy that need to be considered include excessive



FIGURE 5. A–C, Postoperative appearance of the second patient after unilateral osteotomy.

hemorrhage, prolonged edema, bilateral ecchymosis, and nasal obstruction due to excessive narrowing.

Despite that unilateral osteotomy is mostly preferred in patients who do not have a hump as described in studies mentioning this technique,^{4,7} in our study, hump resection was performed on all patients, and no open roof deformity was seen. From our point of view, the high success rates are related to the correct selection of patients for this technique.

This technique was performed on some patients whose deformity was related to only 1 side of the nasal pyramid and the other side was normal. Another important thing in deviated nose is the shape of the nondeviated side, which could be too depressed. Nowadays, autogenous cartilage grafts are being used for repositioning, reinforcement, recontouring, and reconstruction of virtually every component of the nasal skeleton.³ These reconstruction techniques may well be applied to the deviated asymmetric nose. Camouflage grafts aim to create the illusion of the nose being positioned on the midline. Grafts used as camouflage can fill in depression and may improve asymmetries. We used camouflage grafts in 20 patients. In 11 of the 20 patients, we used a cephalic resection material of alar cartilage. In 9 of the 20 patients, we used septal cartilage.

To determine the ultimate value of the described method, conventional osteotomy control group data should be available. However, unfortunately, we were unable to obtain data for a control group, and thus, further study that aimed at resolving this limitation is required. Nevertheless, we are confident of the advantages offered by the described technique over the conventional method of treating posttraumatic nasal deviation.

CONCLUSIONS

Although the unilateral osteotomy technique is not a new concept, it has not received enough interest. In select patients, unilateral osteotomy could be preferred with lessened surgical trauma, lessened intraoperative bleeding, lessened postoperative edema, and lessened recurrence of the deviation. In this study, we presented unilateral osteotomy that is effective and safe technique for correcting external bony deviation with a hump.

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