

The role of ethmoid sinus surgery in the treatment of the twisted nose*

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SUMMARY

The correction of the twisted nose remains a challenge from both the functional and aesthetic points of view. It is well recognized that complete correction of this nasal deformity often necessitates not only reconfiguration of the external nasal framework, but also realignment of the septum. The occasional patient will, in addition, require concurrent middle turbinate resection and/or ethmoidectomy to enable one to achieve full correction of both his/her external and septal deformities. We will briefly outline the rationale for this approach with an illustrative case example.

Key words: ethmoid, sinus, twisted nose, nasal deviation, surgery

INTRODUCTION

Rhinoplasty continues to remain one of the most challenging of surgical procedures. To obtain consistently rewarding results, from both an aesthetic and a functional point of view, one must critically analyze the unique spectrum of deformities present in the individual patient. Vigilant analysis of the nasal framework is of the utmost importance in all nasal surgery, and, in particular, in surgery of the so-called "twisted nose" (Planas, 1977; Courtiss, 1978; Lawson, 1978; McKinney and Shiveley, 1979; Stucker, 1982; Constantian, 1989). The twisted nose, in fact, represents a common aesthetic endpoint arising from a plethora of possible underlying structural problems.

The ideal nasal contour is represented by a smooth symmetrical line curving from the medial brow, along the dorsum and into the area of the tip-defining point. Even a minor deflection of this contour line, either medially or laterally, will impart an apparent curvature of the external nasal framework, giving rise to the twisted nose.

The nasal framework is essentially a tripod configuration, consisting of the nasal bones in the upper one-third and the upper and lower lateral cartilages in the lower two-thirds. Both the bony and cartilaginous dorsum rest on the middle limb of the tripod, the nasal septum. The old adage "*as goes the septum, so goes the nose*" arises from the notion that significant long-term deviation of the septum will lead to, or be associated with, an external nasal deformity. This is especially true with short nasal bones. This is intuitively obvious if one recalls the firm attach-

ments of both the external nasal cartilages and nasal bones to the dorsal septum. If the septum is deflected, the external framework will, of necessity, be pulled along for the ride. If a twisted nose is a result of recent trauma, realignment of both the dorsum and the septum to their pre-morbid status can often be accomplished in a closed manner without significant difficulty and with an often rewarding result. Occasionally, full restitution of septal form following acute trauma may require an open septoplasty approach. Long-standing deformities may result in an activation of chondrocytes in the deflected septum, giving rise to septal spurs, duplications and cartilaginous excess that will have to be surgically addressed. Scar maturation within the soft-tissue envelope and remodelling of the osseo-cartilaginous framework will often lead to long-term molding of the nasal bones. This may give rise to a discrepancy in the height of the two nasal bones, with the nasal bone on the convex side usually longer than its counterpart on the concave side. This difference in height may be addressed by excising more of the nasal bone on the convex side during lowering of the nasal dorsum, prior to osteotomies (Toriumi and Ries, 1993). When there is an adequate nasal airway and the deviation from the ideal contour line is not major, simple camouflage techniques will often suffice in providing an aesthetically acceptable result. One may camouflage a deformity with the use of only grafts of bone, cartilage or synthetic material. Occasionally, spreader grafts may be utilized in the correction of twisting of the middle one-third of the nose, serving to both address cosmetic realign-

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ment concerns, as well as functional needs at the level of the nasal valve (Sheen, 1984).

Well recognized is the fact that if there is co-existent significant deviation of the nasal septum and the nasal framework, it is often not possible to correct a functional breathing problem by only bringing the septum to an anatomically-correct midline position. In fact, this may paradoxically serve to obstruct the patient's airway even further, as the septum now abuts the intranasal aspect of the external nasal concavity and, hence, closes the airway. Therefore, realignment of the external nasal framework to an anatomically more normal position is required to alleviate this problem, and establish an adequate nasal airway bilaterally after septoplasty. Similarly, the converse holds true. Occasionally, one is unable to treat the aesthetic concerns a patient may have with respect to significant twisting of the external nasal framework without concurrently addressing the underlying septal pathology. A major uncorrected deviation of the septum, besides often being of functional importance, may not allow the surgeon to satisfactorily realign the external nasal contour. Furthermore, surgically medializing the nasal bones and upper lateral cartilages against a deviated septum will inevitably compromise the patient's nasal airway. Thus, the rhinoplasty surgeon often needs to address both the septum and the external nose to fully correct the patient's aesthetic and functional concerns.

The nasal septum, of course, does not exist in isolation within the nasal vault. It shares this limited space with the nasal turbinates and the ethmoid system of air cells. In the majority of patients, one can achieve adequate anatomical restitution of both septal and external nasal framework positions without specifically surgically correcting the turbinates and ethmoid sinus. However, in some patients, adequate correction of the twisted nose can only be accomplished if enough room is made intranasally to allow for repositioning of the septum and the nasal bones. Most often, one is dealing with a grossly enlarged middle turbinate or a concha bullosa (aeration of the middle turbinate) that seems to expand into the concavity of the septum. An enlarged, obstructing concha bullosa is generally of no functional significance of itself, but will need to be either resected or otherwise reduced in size (e.g. in-fracturing). We prefer to partially resect the obstructing middle turbinate and, thus, preserve a valuable landmark for any future endoscopic nasal surgery that the patient may require. Out-fracture of the middle turbinate may compromise the ostiomeatal complex. Furthermore, the cribriform plate attachment of the middle turbinate may be disrupted, leading to CFS leaks, dural tears, et cetera. Occasionally, the ethmoid air cell system fills the concavity of the twisted septum. Adequate movement of both the nasal bones and the septum to the midline is really not possible in such a circumstance without first completing an intranasal partial or total ethmoidectomy, which allows the middle turbinate to move laterally, permitting the septum to rest in the midline. Only at this point, will there be enough of a void created to allow for this correction. Deformities or hypertrophy of the inferior turbinate have often been associated with septal deformities. The necessity of addressing such inferior turbinate pro-

blems when correcting the septum, has been well established. Although far less common, deformities within the middle turbinate or ethmoid sinuses should be addressed utilizing these same principles.

The need for ethmoid sinus surgery will, of necessity, have to be assessed pre-operatively. A thorough intranasal examination is of utmost importance in the patient with the twisted nose. An enlarged, obstructing concha bullosa can be easily visualized (and palpated after topical anaesthesia) with a nasal speculum. Decongestion of the nasal vault is usually needed to allow clear visualisation of the anterior and superior extent of the ethmoid sinus air cell system. Nasal endoscopy may also be required to help determine whether an ethmoidectomy is necessary to perform at the time of corrective nasal surgery (Messerklinger, 1978). If the need for ethmoidectomy appears to be present, a coronal CT scan of the sinuses may help in clearly visualising the problem at hand as well as serving as a useful guide to surgical correction. Intranasal ethmoidectomy - whether performed under direct vision or with the use of an endoscope - is a simple procedure, with few complications if performed by an experienced sinus surgeon following well-established anatomical landmarks (Wigand et al., 1978; Kennedy et al., 1987; Stankiewicz, 1989).

The following case example will be used to demonstrate some of the typical findings in this subset of patients with the twisted nose.

CASE REPORT

K.D. is an otherwise healthy 17-year-old male who presented to our office for aesthetic correction of his external nasal deformity. Upon physical examination, he was noted to have a classically twisted nose, with significant asymmetry and malalignment of the nasal bones and upper and lower lateral cartilages (Figure 1). On three-quarter view, one notes an excessively generous nasal dorsum as well as microgenia (Figure 2).

Intranasal examination revealed caudal septal deflection into the right nasal airway. This deflection continued posteriorly and was associated with both reduplication of the septum as well as the presence of some septal spurs. After nasal decongestion with topical oxymetazoline spray, one could visualize the ethmoid air cell system impinging on the septal concavity high on the patient's right side. Inability to clearly visualize the left side and the desire to have more preoperative information in handling this complex problem, led us to obtain a coronal CT-scan of the sinuses (Figure 3). The patient had no radiological evidence of chronic sinus disease. The CT scan did, however, confirm our impression that the ethmoid air cells would have to be addressed at the time of corrective nasal surgery to allow for full correction of the patient's problem. Thus, he underwent an uneventful bilateral, intranasal endoscopic ethmoidectomy with partial middle turbinate resection to allow the septum to be brought into an anatomically acceptable and functionally important midline position. Once this had been accomplished, we were able to address the external nasal contour problems. An external rhinoplasty approach was used to provide the patient with more tip symmetry, definition (cephalic trimming

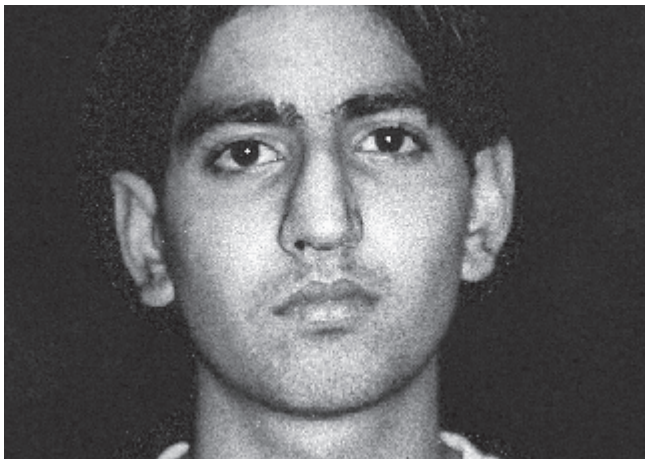


Figure 1. Frontal pre-operative view of patient K.D. Note severe twisting of upper two-thirds of nasal framework.

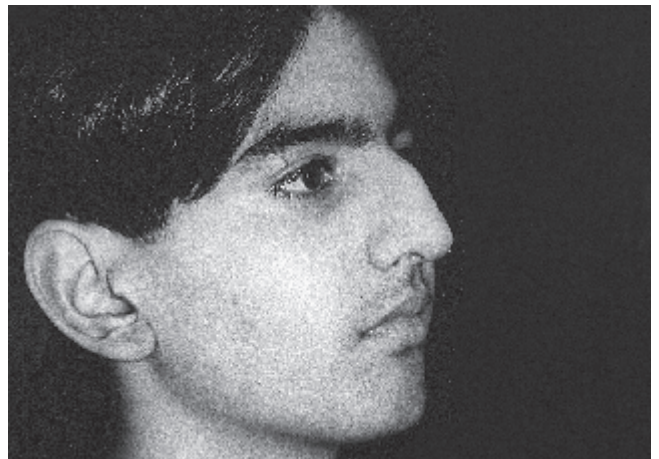


Figure 2. Three-quarter view of K.D. pre-operatively. Note dorsal hump and relative microgenia.

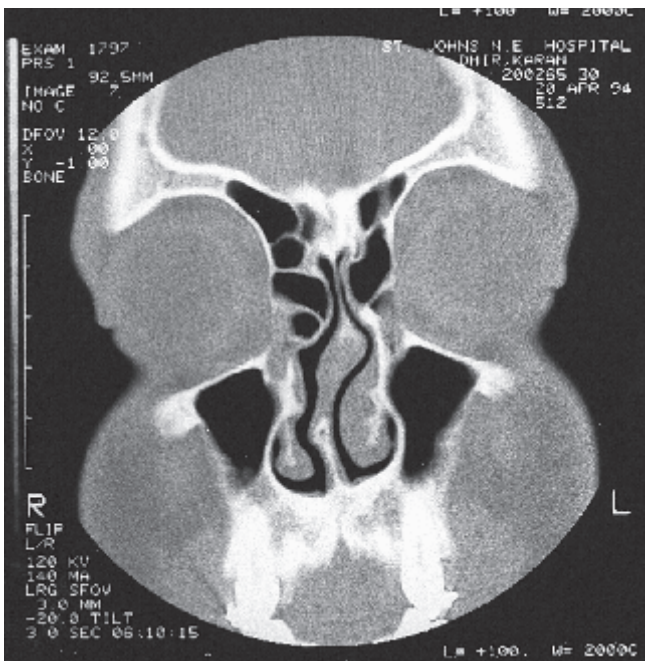


Figure 3. Pre-operative coronal CT-scan confirming septal deviation and ethmoid sinus obstruction.

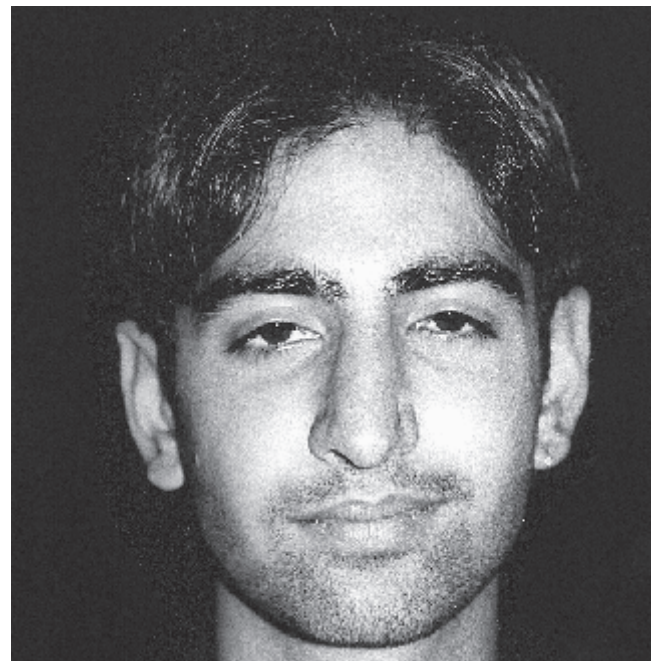


Figure 4. Post-operative frontal view revealing amelioration of external nasal appearance with straightening of upper two-thirds of nasal framework.



Figure 5. Post-operative three-quarter view revealing amelioration of dorsal hump.

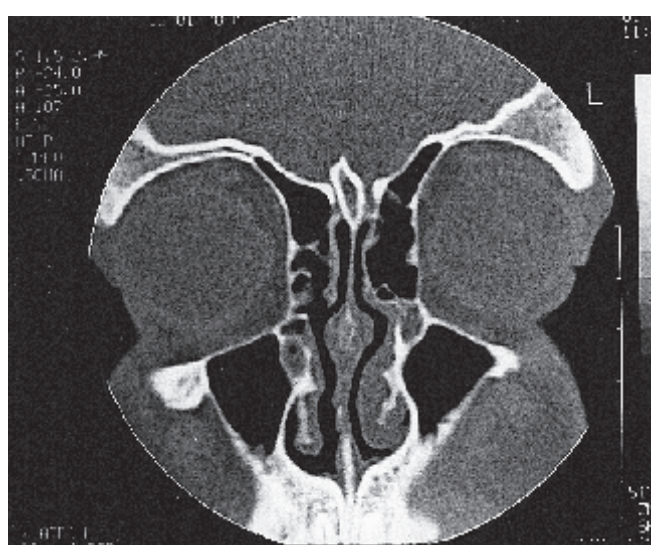


Figure 6. Post-operative coronal CT-scan revealing septal straightening made possible through partial middle turbinate resection.

of the lower lateral cartilages and interdomal suture restitution) and support (columellar strut), as well as to allow for reduction of his dorsal height. The upper lateral cartilages were separated from the septum and then sutured to the dorsal cartilaginous septum, after the dorsum had been reduced. Finally, osteotomies were utilized to bring the nasal bones to a more aesthetically-pleasing midline position. The repositioning of the nasal bones was only possible due to the enlargement and re-orientation of the intranasal space created by the ethmoidectomy and septal realignment. A 6-month follow-up result reveals improvement in external nasal appearance and nasal breathing (Figures 4-5). The patient was quite satisfied with his result from both an aesthetic and functional point of view. Follow-up coronal CT-scan of the sinuses reveals a section through the level of the partially resected middle turbinate, allowing midline placement of the nasal framework (Figure 6).

DISCUSSION

Certainly, the vast majority of patients presenting for correction of their external nasal deformity do not require concurrent ethmoid or turbinate surgery. However, one should always be wary of the patient with the twisted nose. These patients require analysis of not only their framework but, in addition, a thorough intranasal evaluation. Should a deviated septum prevent pleasing nasal bone reconfiguration, septoplasty will need to be performed. Likewise, should concha bullosa or ethmoid sinus air cells be felt to be preventing corrective nasal framework or septal manipulation, partial turbinate resection or ethmoidectomy will need to be performed. In the occasional patient with the twisted nose, this will be the only definitive method of complete functional and aesthetic correction.

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