

## State of Art in Management of the Twisted Nose

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### INTRODUCTION

Management of the twisted nose remains one of the most challenging problems in rhinoplasty [1,2]. This is due to the fact that: Two thirds of the nose is made of cartilage which doesn't "stay put" but tends to spring back to its former position - extensive septal surgery will be required - asymmetry of the bony side wall may not be corrected by the usual medial and lateral osteotomies. Asymmetric noses typically are characterized by deviation of the bony upper third and/or the cartilaginous lower two thirds of the nose [3]. There are two descriptive types of nasal deviation, C-type and I-type twisted noses, the tip may or may not be midline. Neglected or partially reduced nasal fractures usually result in a crooked nose associated with surface depressions and irregularities [4]. Birth trauma may result in nasal septal deviation. Nasal septal deformities are estimated to occur in 1.25-23% of newborns. Forceps-assisted or breech delivery often is mentioned as the etiology of injury. Because cartilage has a definable intrinsic stress system that when disturbed by fractures, develops an imbalance that can lead to its bending. Patients with external nasal deformities frequently experience progressive nasal obstruction. Offending trauma leads to both septal deviation and disruption of traditional nasal support mechanisms. With loss of nasal support, internal and external nasal valve collapse may result [5].

When faced with a twisted nose, rhinoplasty surgeons tend to be divided into those who perform an anatomic reconstruction and those who prefer camouflage techniques. Correction of twisted nose represents the convergence of two procedures, augmentation and reduction; this marriage is fragile and demands careful pre-operative evaluation, an understanding of anatomic form and physiologic function and surgical finesse [6]. The use of cartilage

[2,7], bone [8], Medpore [9], Alloderm dermograft [10] as pillars, struts, camouflage, or filler is implanted selectively to augment, buttress, amplify or contour. Equally common in the surgical theater are techniques of reduction. Cartilage is trimmed, humps are removed, osteotomies are completed and the septum is abbreviated [11].

### PATIENTS AND METHODS

This study was done on 35 patients with deformed nose. Their ages were ranged from 21 to 45 years (mean  $30\pm 6$ ). 25 males and 10 were females. 30 out of the 35 patients had definite history of trauma. Pre and post-operative assessment was including 1- Clinical assessment of the external nasal appearance, light reflection between the medial end of the eyebrow and nasal tip definition point on the same side, the pattern of the nasal deformity and the angle of deviation of the nasal dorsum from the midline before and 6 months after the operation. 2- E.N.T. examination to analyze the nature of the of septal deviation and its relation to the turbinate. Measurement of the attaching angle of the upper lateral cartilage. Complete internal nasal examination using telescope (Zero degree, 30 degrees) after application of nasal decongestant to allow better visualization of the septum, turbinate, meati, nasal floor and posterior nasal aperture. 3- Radiological assessment included pre operative 3D CT, traditional and rendering. 4- Photography pre and post-operative was done in 4 views antero-posterior, lateral, three-quarter and warm-eye view.

*Surgical technique:* We used general anesthesia for all the cases. The surgical approach was through infra-cartilaginous incision and membranous septal incision. Upper sulcus incision was done in cases needed septal re-orientation.

Separation of the upper lateral cartilage from the septum and from the lower lateral cartilage was carried out. Submucoperichondrial degloving of the septum was undertaken. Septoplasty was done for 30 cases through scoring the cartilaginous part and placement multiple inverting stitches while septal resection was done for 5 cases to correct the deviated nasal septum, scoring of the L-strut also was carried out followed by its straightening using cartilage strut graft. Correction of the deviated perpendicular plate of ethmoid was carried out in 10 patients. Re-insertion of the septum to the anterior nasal spine was done in 3 patients. Basal and dorsal osteotomies were done either equal or unequal according to the present deformity. Resection of the nasal hump or pseudo-hump was done in 26 patients. Augmentation was carried out using septal cartilage (5 patients), choncal cartilage (25 patients), Med pore (3 patients) and Dermofat graft (2 patients). It was done to the dorsum and the root of the nose. Fixation was done by per-cutaneous tie-over of the graft.

Nasal pack was done and removed after 48 hours. In cases of Septoplasty (30 cases), internal splint was done by X-ray film which was fixed to the membranous septum and removed after 3 weeks. External fixation was done by Thermoplast for 2 weeks.

## RESULTS

Analysis of our data revealed that male to female ratio was 2.5: 1. The interpretation between the clinical, 3D CT scanning and reading 3D CT scanning, showed that there were 4 patients diagnosed as deviated nasal bone, while scanning represented bone resorption. The pattern of deformity was I in 20 patients (57%), the angle of deviation from the midline were ranged from 20-30 degrees (M  $23\pm 17$ ). S or C shaped deformity of the nasal dorsum in 5 patients (14%), the remaining 10 patients (29%) presented by depressed nasal dorsum and complex deformity. Examination of our patients 6 months post-operatively revealed that from the functional point of view there was no recurrence of manifestation especially nasal obstruction. While from the esthetic point of view, there were 7 (20%) out of 35 patients on study will need secondary surgery to correct recurrence or remaining deformity. The I pattern of septal deviation showed recurrence in 4 patients (25%), however the angel of deviation from the midline reduced to be from 5-15 degrees. One patient with S deformity (20%) needed secondary surgery to improve the results, While the remaining 2 (20%) out of the 10 patients presented with the complex type of nasal deformity

showed unsatisfactory esthetic results after the primary surgery. However, the percentage of patient satisfaction was 91.5% (32 patients) as 3 only out of the 7 patients having incomplete correction, from the surgical point of view, were asking for secondary surgery.

Fig. (1)

Fig. (1): "T" pattern twisted nose. A,C, Pre-operative antero-posterior view and three quarter view. B,D, Post-operatively. E, Warm eye view showing the deviation of the columella. F, Post-operatively the columella straightened after translocation of the cartilaginous septum and its reinsertion to the anterior nasal spine. G,I,K Pre-operative views of 3D CT with coronal surface and bony rendering reformat demonstrate the external nasal deformity with deviation of the nasal septum and right lateral nasal bone. H,J,L post-operative view showing the deformity after correction. Note: Surface & Bony rendering view very helpful to analyze the deformity and its components which may be bony, cartilaginous, or soft tissue.

Fig. (2): C pattern twisted nose due to bone resorption rather than bone deviation as shown in 3D surface rendering bony reformat A, Pre-operative. B, Post-operative.

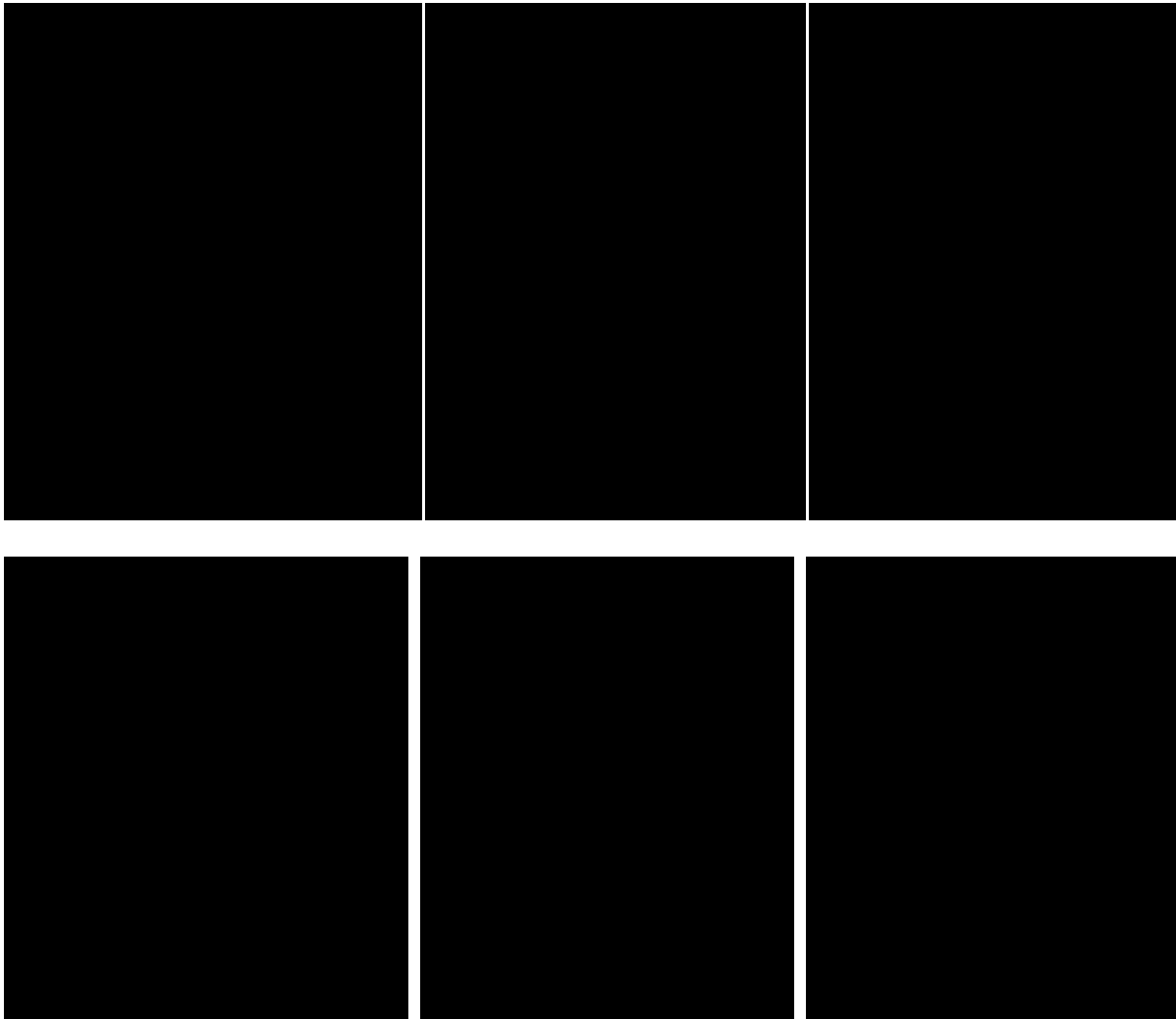


Fig. (3): Complex pattern of nasal deformity. A,B,C, pre-op. D,E, F post-operative view after correction by Medpor, it corrects both saddling and deviation. G 3D CT.

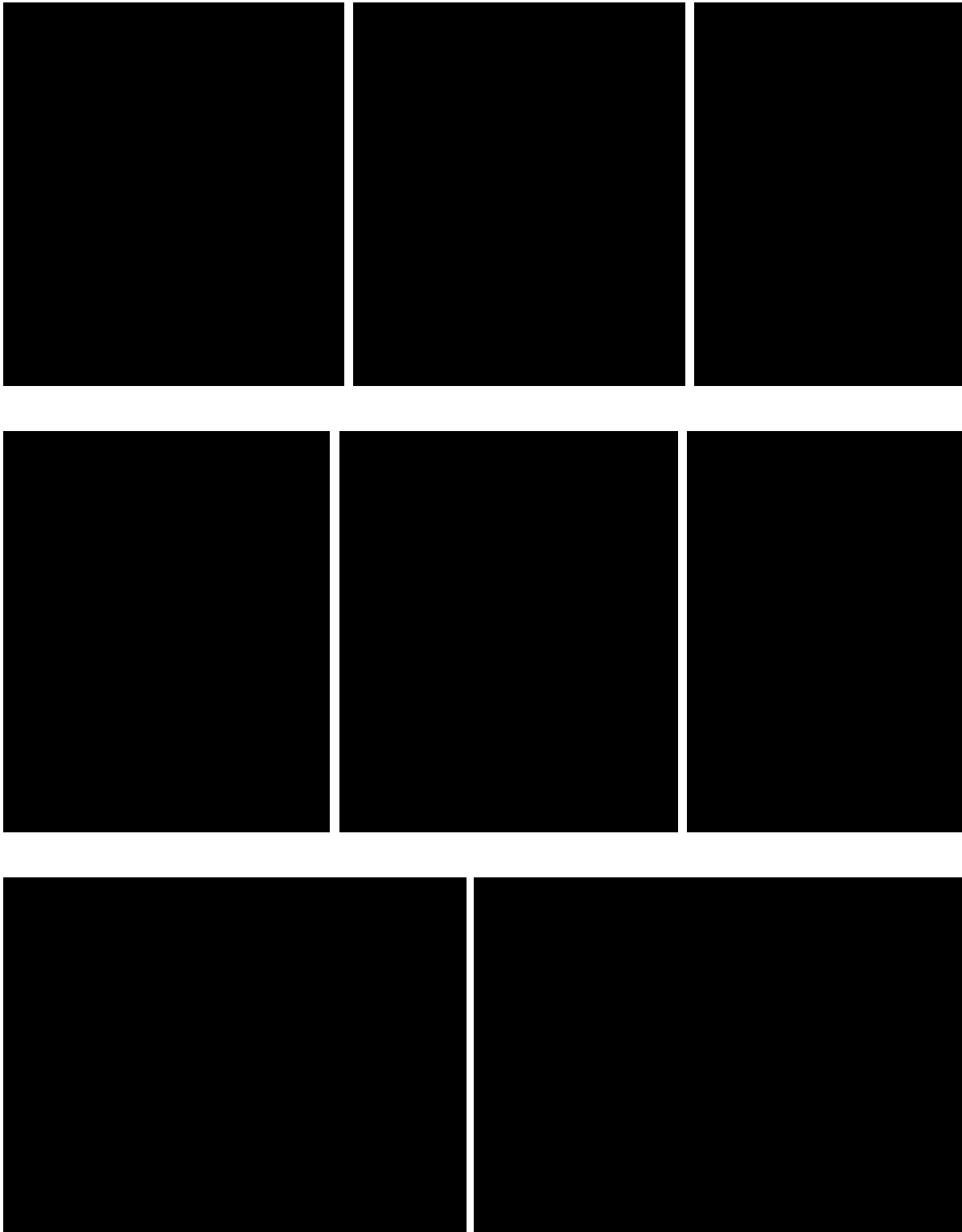


Fig. (4): Complex type of nasal deformity. A,B,C pre-operative view showed deformed middle vault together with deviation. D,E,F, Post-operative views G, Conchal cartilage, its length about 3 cm which could bridge the depression after bilateral basal osteotomies of the nasal bone. Its convexity increase the three dimensional size. H showed the site of per-cutaneous basal osteotomies unnoticed.

## DISCUSSION

Repair of the twisted nose presents a challenge, as often functional problems as well as aesthetic deformities must be addressed. It stills a theatre of discussion and comments [4].

First, who is the best surgeon? From the functional point of view, dealing with septal deviation, nasal valves, choncal state was best done by the ENT surgeon, while the esthetic lines of the nose and camouflaging the defect and the deviations is the field of plastic surgeon. So, the best solution of such problems could be achieved through the merge between the two specialties in a team work, rather than division of treatment strategy into anatomical repair and camouflaging techniques. Our policy associated with increased the incidence of patients satisfaction and reduced the number of surgeries.

The involvement of 3D CT scanning as an essential maneuver for assessment of the twisted nose was mentioned in the literature. We added the use of rending view which allowed better interpretation between 1- The component of the nasal deformity (Bone, Cartilage and/or Soft tissue). 2- The presence of deviation or defects and 3- The effect of all these changes on the overlying skin. These will affect the decision making as correction of deformed nose differs from restoration of bone defect, although externally both abnormalities were the same. Computer assisted correction could be done through the rending view to see the suspected results.

Second, what is the best approach? An anatomic correction of the twisted nose through an open approach was performed [18]. The septum was freed from the extrinsic forces of the deformed nasal bones and upper and lower lateral cartilages [12]. We convenient that the best approach depend on the surgeon preference and experience. The infra-cartilaginous and membranous septal incision was sufficient to do all the maneuvers (separation of the cartilages, resections, implantations and dealing with the septum). Upper sulcus incision was carried out in cases where septal translocations were indicated. Lateral nasal osteotomy was done through a per-cutaneous approach.

Third, Septoplasty or submucous resection?. We preferred Septoplasty as it is more physiologic, less risky as regard septal perforation and there was no hematoma. The compression induced by the X-ray film in one side and the cartilage in the other (2 firm surfaces) allowed adequate compression. On the other hand, there was no need to

excessive packing of the nose, the later may lead to displacement of the lateral nasal wall after the lateral osteotomy [13]. Submucous resection (SMR) for the deviated nasal septum had been criticized to have a higher complication rate and less patient satisfaction than septoplasty [14]. However, still there was a place for the submucous resection especially if there was sever septal deviation and/or involvement of its bony part [15].

Fourth, the type of material used to correct the nasal defect, this may be Cartilage, Bone, Dermofat, or Med bore. Each has its own advantages and disadvantages, our study did not include the comparison between the results of these material. We concentrate on the indications of each. The comonest was the choncal cartilage, although it did not offer block as rib or the cartilaginous septum, it has a natural curves and it is concave so that allow three dimensional reconstructions without the need of more cartilage. There was no donor site morbidity; it was easy to harvest specially if one will not going to do submucous resection of the cartilaginous septum [16]. However, if the amount of defective bone or cartilage is big, both choncal cartilages may be insufficient. Septal cartilage was considered an excellent source for cartilage graft especially if one going to do submucous resection for the septum. However, we must take care that in post traumatic deviated nose, part or most of the septum may be replaced by fibrous tissue. We have no experience of bone grafting in reconstruction of the nasal deformity, especially in the presence of Medbore which solved many problems in nasal reconstruction [17]. We think that impregnation of the Med bore in antibiotic solution prior to its use will prevent the infection with subsequent rejection. Dermofat graft was used to reconstruct small defect and camouflaging recurrence.

The incidence of patient satisfaction (91.5%) was within the incidence mentioned the literature [2,18,19,20]. Also, the incidence of functional results was concomitant with. Of course the surgeon's eyes can see higher incidence of recurrence 20% (7 patients) but not all of them well agree to do secondary minor surgeries specially with good function of the nose.

### Conclusions:

Repair of the twisted nose presents a challenge, as often-functional problems as well as aesthetic deformities must be addressed.

First, the best solution of such problems could be achieved through the merge between the two

specialties (Plastic & Reconstructive Surgery) in a team work.

Second, rendering CT view allowed better interpretation between 1- The component of the nasal deformity (Bone, Cartilage, or Soft tissue). 2- The presence of deviations or depressions and 3- The effect of all these changes on the overlying skin. The 3D, spiral and rendering surface and bony scanning change the balance between augmentation and reduction.

Third, we preferred septoplasty as it is more physiologic, less risky as regard septal perforation, there was no hematoma because the compression induced by the X-ray film in one side and the cartilage in the other (2 firm surfaces) allowed adequate compression, on the other hand, there was no need to excessive packing of the nose, the later may lead to displacement of the lateral nasal wall after the lateral osteotomies.

Fourth, when septal cartilage reserves are limited, auricular cartilage is a good alternative.

Fifth, in severely twisted noses the possibility of secondary surgery should be considered from the start.

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