

Extracorporeal Septoplasty: A Boon for Correction of Crooked Nose

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Facial asymmetry,
Nasal bone, Nasal cartilage,
Osteotomy, Splint, Vomer.

ABSTRACT

Crooked nose is one of the most challenging deformities presenting to a plastic surgeon. Severe nasal septal deformities are responsible for functional and aesthetic impairments. Classical techniques can, sometimes, lead to disappointing results or relapse. We recount our experience of extracorporeal septoplasty (ECS) for correcting a post-traumatic case of severely deviated nose. A 32-year-old male presented to our outpatient department with complaints of trauma one year back, with gradually increasing nasal obstruction (right > left) and gross deviation of nasal dorsum and tip. Computed tomography revealed S-shaped deviation of nasal septum in both axes, synechiae between right lateral wall and septum, hypertrophy of left inferior turbinate and deviation of bony septum. We performed ECS, used rib cartilage for septal extension graft, columellar strut graft and spreader graft and diced cartilage for minor dorsal irregularity. There was improvement in both obstruction symptoms and aesthetic outcomes. Strong reattachment of the neoseptum is the most essential step in ECS. ECS has been shown to provide long-lasting results with minimal revision rates.

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INTRODUCTION

Crooked nose is one of the most challenging deformities presenting to a plastic surgeon. Crooked nose deformity can be defined as the deviation of the nasal bone and cartilage pyramid relative to the facial sagittal plane.¹ A crooked nose is a complex cosmetic and functional problem involving multiple structures, such as bone, cartilage, and skin. The case becomes even more demanding when the crooked nose results from previous trauma. Growth superimposed on preexisting scars and deformed cartilages leads to grotesque disfigurement.²

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The septum directs the form and function of the nasal suprastructure.³ The septum alone or the septum with the bony vault is responsible for the deviation of the nasal unit. Releasing all the intrinsic and extrinsic pathological subunits and relocating them appropriately is essential.

In-situ septal corrections, by applying radial incisions on cartilage, or removal of deviated segments, can correct minor aberrations. Due to the property of cartilage memory, these procedures cannot remedy extreme deviations.² Extracorporeal septoplasty (ECS) is a radical method for correcting a severely deviated septum.¹ In ECS, the entire septal cartilage is harvested, and a new septum is built extracorporeally. This achieves septum straightening and increase of tip projection simultaneously. We recount our experience with ECS for correcting a post-traumatic severely deviated nose.

CASE

A 32-year-old male presented to our outpatient department with complaints of trauma one year back,

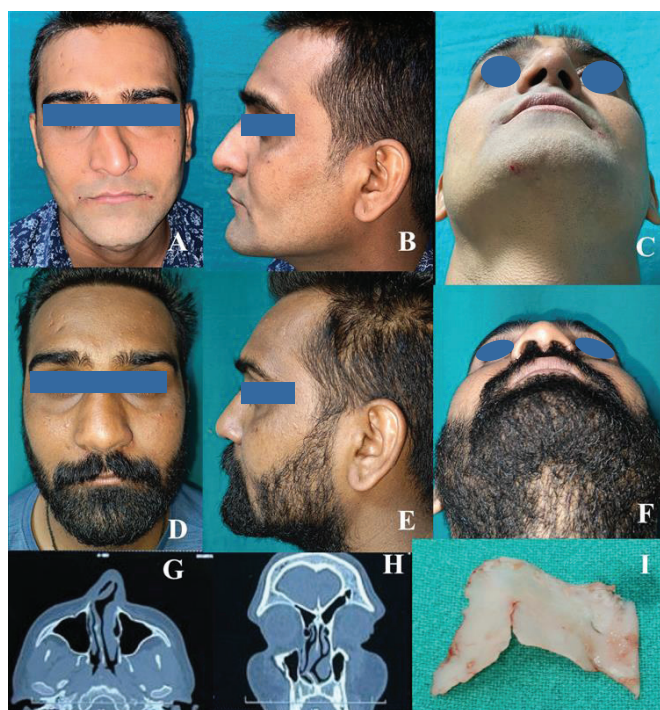


Figure 1 A. Preoperative, frontal view; B. Left lateral view; C. Worm's eye view; D. Three months postoperative, frontal view; E. Left lateral view; F. Worm's eye view; G. CT Scan axial section demonstrating gross deviation of septum in left-right and anteroposterior directions; H. CT Scan coronal section demonstrating gross deviation of septum in craniocaudal direction; I. The septal cartilage is thinned and grossly deformed.

with gradually increasing nasal obstruction (right > left) and gross deviation of the nasal dorsum and tip. (Figures 1 A, B, C) Facial computed tomography revealed S-shaped deviation of the nasal septum in both the cephalo-caudal and anteroposterior axis, synechiae between the right lateral wall and septum, hypertrophy of left inferior turbinate and deviation of the bony septum. (Figures 1 G, H) The cottle test was positive on both sides. The patient was planned for open septorhinoplasty. Written and informed consent was obtained for the patient's photography, publication, and surgery.

Under general anesthesia and after infiltration of adrenaline, a transcolumellar inverted V incision was applied, which was extended to bilateral infracartilaginous incisions. Carefully preserving the medial crurae of both lower lateral cartilages, dissection was done through the supraperichondrial plane upto the bony vault. Dissecting through the membranous septum, the caudal end of the septum was located, and dissection of the septum was done

in the submucoperichondrial plane, taking care to not perforate the mucosa. The upper lateral cartilages were separated from the septum. Septal mucosa was completely elevated from cartilage. The septum was seen to be grossly deformed at multiple sites (Figure 1 I). We realized that leaving a dorsal strut would not correct the deformity. So, we proceeded to do ECS. The whole septal cartilage was delivered. The dorsal hump was rasped.

The left sixth rib cartilage was harvested. The rib cartilage was cut to create a septal extension graft, columellar strut graft, and spreader graft. The anterior nasal spine was dissected. The columellar strut graft was sutured to the anterior nasal spine using 4-0 polydioxanone sutures in the figure eight fashion. The septal extension graft and spreader graft were fixed in position between the upper lateral cartilages using 26G needles and sutured with 4-0 polydioxanone sutures. Lateral low-to-high osteotomies were performed. The left nasal bone was out fractured, and the right nasal bone was infractured. The septal extension graft was sutured to the middle crura of both lower lateral cartilages. Interdomal sutures were applied with 4-0 polydioxanone sutures. The skin was draped, and the stability of the construct was ensured. A slight depression was palpated on the dorsum. The rest of the cartilage was diced, wrapped in Surgicell to create Turkish delight, and placed in the depression. The skin was closed with 5-0 polydioxanone and 6-0 Nylon sutures. Quilting sutures were applied in the mucoperichondrial part of the septum.

Merosil was placed in both nasal cavities, and a dorsal splint was applied. Merosil was removed on day 3, and nasal decongestants were started. Sutures were removed on day 5. The splint was continued for 1-month. The degree of nasal obstruction was graded before and after surgery for 3-months on visual analog scale between 0 to 10. Preoperatively, our patient had grade of 8, which reduced to 2 at 1-month postoperatively and zero at 3-months postoperative. The subjective aesthetic satisfaction of the patient was excellent at 3-months postoperatively (Figures 1 D, E, F). In the first month, the patient complained of mild obstruction in the contralateral airway, which could be attributed to the hypertrophied inferior turbinate. This complaint subsided over the next two months.

DISCUSSION

The correction of septum is a must for successful treatment of deviated nose.⁴ The complications following the use of the native septum are basically due to insufficient or weak cartilage and thick skin, both common in Asian patients.⁵ ECS is useful when in-situ septoplasty may be inadequate or lead to recurrence. There is no well-defined indication for either technique in the current medical literature, except for some subjective considerations. This is because the disease itself is so complex. Most surgeons decide by looking at the condition of the septal cartilage. Gode *et al.* performed a randomized controlled study to answer this decade-old question. They concluded that both functional and aesthetic outcomes improved significantly in both groups, but the improvement was much more in the ECS group.⁶

ECS was first described in 1952 by King and Ashley. Much work has been done since then. Gubisch performed ECS in 2119 patients over two decades and chronicled his experience of successful results in ~90% of patients.² He emphasizes that the most critical point in ECS is reimplanting the new septum. This requires stable and strong reunion of both the cranial and caudal ends of the neoseptum. Either of two surgical techniques are used to fix the cranial dorsal neoseptum to the bony-cartilaginous transition zone: classical U-shaped sutures to the upper lateral cartilages or the criss-cross sutures. Gubisch also described the transcutaneous transosseous cerclage suture, in cases of very short nasal bones, which do not permit the criss-cross suturing. Criss-cross or transcutaneous cerclage sutures are essential with lateral nasal bone osteotomies, as the nasal framework is very unstable. When osteotomies are not done, fixation to the upper lateral cartilages alone may suffice.⁶

Neo-L-strut should be minimum 30–35 mm broad at the cranial end and 20–25 mm at the caudal border.⁷ Lack of sufficient septal cartilage is an indication for rib cartilage graft. One significant disadvantages of the rib cartilage is its tendency to warping. Warping is reduced by sectioning the cartilage, keeping the cartilage hydrated, and using the core sections for straight grafts. Other options for neoseptum reconstruction are the use of bone and artificial substitutes. Bone has tendency of resorption. Synthetic materials such as polydioxanone foil, act as scaffolding

and guide cartilage regeneration.⁸ However, these biomaterials are prone to foreign body reaction. Need of nonstructural grafts, such as for supratip, nasion, or lateral nasal wall camouflage, can be met by conchal cartilage. Conchal cartilage is not reliable for structural grafting.⁷

The most common complication noted by Gubisch was contour irregularity on the dorsum.² We, too, had contour irregularity of the dorsum and identified it intraoperatively. We tackled it using the diced cartilage “Turkish delight” technique. The result obtained was stable and satisfactory. Most surgeons, including us, use the open method to approach the septum and dorsum. The closed technique of ECS is also possible but technically challenging. It is significantly more challenging to securely fix the neoseptum on the keystone area and graft the internal nasal valve, with a closed approach.²

CONCLUSION

Severe nasal septal deformities lead to functional and aesthetic impairments. Correction of these deformities can be complex, and restoring perfect nasal shape and function is challenging. ECS is an effective method to correct severe deviations. Fixing the neoseptum to the keystone area and the anterior nasal spine properly is vital for long-lasting results.

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