

The role of extracorporeal septoplasty in management of crooked nose

• Mohamed R. Elhadidy¹ • Amr M. E. Khater¹



MOHAMED R. ELHADIDY

SUMMARY

Introduction: Deviation of the nasal pyramid from the midline results in functional and aesthetic concerns. In this case series, we evaluate the results of extracorporeal septoplasty in correction of crooked nose.

Patients and methods: Fifteen cases were included in this study. Preoperative evaluation included clinical, photographic and radiological evaluation. Extracorporeal septoplasty together with bilateral spreader graft were done for all cases. Postoperative evaluation was done after one year.

Results: Eight patients were females and seven cases were male. The causes of septal deviation were idiopathic (3 cases), traumatic (10 cases) and cleft lip nasal deformity (2 cases). The source of grafts were the nasal septum, the vomer or the ribs. Postoperatively, nasal obstruction was improved in all cases (in 93.3% of cases) and patients' satisfaction was high (in 86.7% of cases).

Discussion: Plastic surgeons correct the deformity of the crooked nose by many techniques. Galloway and Fomon used extracorporeal septoplasty. Toriumi and Ries used unilateral spreader graft on the concave side of the septum. Guyuron recommend the use of bilateral spreader grafts for more stable and fixed correction of the weak nasal septum.

Conclusion: Crooked nose correction can be achieved by the combined use of extracorporeal septoplasty together with bilateral spreader grafts. This technique resulted in functional and aesthetic improvements with stable results over one year.

KEYWORDS

rhinoplasty, nasal septum, crooked nose, vomer.

INTRODUCTION

We can describe the phrase «crooked nose» as deviation of the nasal's midline from the medline of the face. The deviated nose may be deviated completely to one side from the midline, or appears as either S shaped or C shaped. This condition results in both aesthetic concerns, breathing difficulties and psychological impacts [1].

The correction of the crooked nose entails proper identification and correction of the deviated nasal structures including the septum, nasal bones, the upper lateral cartilages and the lower lateral cartilages [2-4]. For correction of the crooked nose, there are many septorhinoplasty techniques including septal cartilage scoring, use of spreader grafts [5], Septal crossbar graft [6] and Extracorporeal septoplasty (ECS) [7].

Extracorporeal septoplasty (ECS) technique includes complete removal of the nasal

¹ Departments of Plastic & Reconstructive Surgery, Faculty of Medicine, Mansoura (Egypt)

septum, followed by reshaping of the septum and finally reinsertion of the septum back into the nose. Stable fixation of the reinserted septum is important for maintain successful outcomes. The reinserted septum should be fixed to the upper lateral cartilages and anterior nasal spine [8-9].

In this study, we evaluate the functional and aesthetic results of the usage of a modified extracorporeal septoplasty (ECS) technique in correction of the crooked nose deformity.

Patients and Methods

This study included 15 patients who were complained of deviated nose and were surged upon using open rhinoplasty and extracorporeal septoplasty. Patients' demographic data are shown in **table 1**.

→ Preoperative assessment

Included nasal history where we asked about allergic disorders, nasal obstruction, history of previous nasal trauma or operation, smoking, drug abuse and antiplatelet me-

dications. Then we examined the nose for the state of external nasal valves, internal nasal valve (Cottle test). By the use of nasal speculum, we searched for septal abnormalities including deviations, spurs, perforations and hypertrophy of the inferior turbinate.

CT scan was done to evaluate the condition of the nasal bones and nasal airway abnormalities. Standard digital photos were obtained including frontal, oblique, lateral and basal views followed by nasal analysis.

Table legends

Pat.	Age	Sex	Cause	Type of deviation	Type of grafts	Functional improvement	Aesthetic improvement
1	25	m	trauma	bone cartilage	septum	improved	satisfield
2	18	m	trauma	bone cartilage	septum	improved	not
3	19	m	congenital	bone cartilage	septum	improved	satisfield
4	20	f	trauma	bone cartilage	septum	improved	satisfield
5	25	f	CLND	maxilla, bone cartilage	vomer	not	satisfield
6	30	m	trauma	cartilage	septum	improved	satisfield
7	34	m	trauma	bone cartilage	septum	improved	satisfield
8	32	f	trauma	bone cartilage	rib	not	not
9	26	f	congenital	bone cartilage	septum	improved	satisfield
10	18	m	trauma	cartilage	septum	improved	satisfield
11	36	f	trauma	bone cartilage	septum	improved	satisfield
12	20	f	congenital	bone cartilage	septum	improved	satisfield
13	26	m	CLND	maxilla, bone cartilage	vomer	improved	satisfield
14	40	f	trauma	cartilage	septum	improved	satisfield
15	29	f	trauma	bone cartilage	septum	improved	satisfield

m: male; f: female; CLND: cleft lip nasal deformity

→ Surgical technique

Under general anesthesia, we placed the patient in the supine position and the patient was prepped and draped. We infiltrated the incision lines and the nasal septum with 1:100 000 units of Adrenaline and 1% Lignocaine solution. After 15 minutes, we start the surgery by making an inverted V transcolumellar incision and connect it to the bilateral marginal incisions.

We start the elevation of the skin from the lower lateral cartilage (LLC) and nasal tip until we reach the anterior septal angle. We continue the dissection until complete exposure of the upper lateral cartilage (ULC) in the supraperiochondrial plane and nasal bones in the subperiosteal plane.

Next, deep dissection the ULC and nasal bones with preservation of the mucoperichondrium was done. Then, removal of dorsal hump was achieved by the use of No. 15 scalpel to remove the cartilaginous hump and nasal rasp to remove the bony hump. Later, both ULCs were separated from the dorsal septum and we start elevation of mucoperichondrial flaps on both sides of the nasal septum (**figure 1**) in order to perform complete removal of the nasal septum including the quadrilateral cartilage.

In case of displacement of the anterior nasal spine (ANS) to one side, it should be realigned in the sagittal plane before reattachment of the new septum. L-shaped septal strut with width ranges from 5-10 mm is created from the excised septum. Incomplete partial thickness incision are made on the concave side in order to straighten the septum and bilateral spreader grafts are fabricated from the residual septal cartilage are sutured back to the L-shaped septal strut as in **figure 2**.

The reconstructed septal cartilage is returned back to the nose and sutured to the anterior nasal spi-

ne and the upper lateral cartilages using 5/0 Prolene mattress sutures.

Later, we start modification of the nasal tip by fixation of a columellar strut, previously fashioned from the resected septal cartilage, between the medial crura of the lower lateral cartilages (LLC).

More tip definition can be achieved by cephalic trim of the lateral crus. Then, we performed medial and lateral nasal osteotomies followed by complete mobilization and narrowing of the nasal bones. In case of cleft lip nasal deformity, hypoplastic maxilla can be corrected by insertion of Vomerine bone graft. Finally, skin closure and application of nasal packings filled with adrenaline solution and gentamycin ointment, internal and external nasal splints.

Figure 1.

Interazione gene-ambiente nell'invecchiamento on mi avesse spiegato a cosa sarei andata incontro. Sì, psoriasi non era un termine nuovo, l'avevo sentita nominare dai miei familiari, mio nonno



Figure 2.

Reconstructed new septum including a L shaped strut and bilateral spreader grafts just before its reinsertion in the patient.

Results

Eight patients were females and seven cases were male. Age ranged from 18-40 years (mean 26.36 years). The causes of septal deviation were congenital (3 cases), traumatic (10 cases) and cleft lip nasal deformity (2 cases).

We performed extracorporeal septoplasty in all cases. The source of grafts were the nasal septum, the vomer or the ribs.

We used rib graft in one case because the patient had previous surgery at her septum and had previous septal perforation.

However, this patient was not satisfied about the results of surgery. Postoperatively, nasal obstruction was improved in 93.3% of cases and patients' satisfaction about the sha-



Figure 3.
Case number 1, 25 years old male figure: preoperative view (A) and postoperative view (B).



Figure 4.
Case number 11, 36 years old female: preoperative view (A) and postoperative view (B).

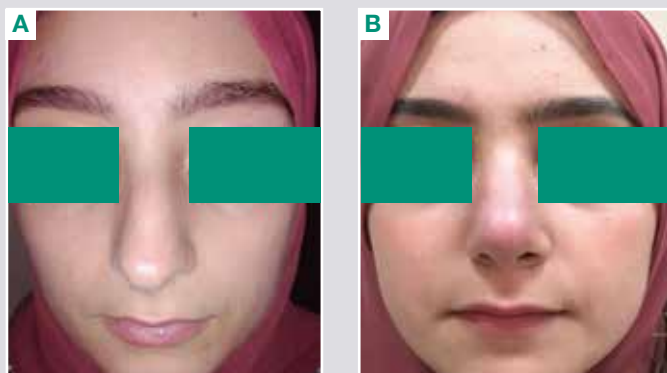


Figure 5.
Case number 12, 20 years old female: preoperative view (A) and postoperative view (B).

pe of their noses was high (in 86.7% of cases), **figures 3-5.**

Discussion

In this study, we used the modified extracorporeal septorhinoplasty through an open approach in correction of nasal septal deviations. This technique improved the aesthetic and functional conditions of our patients.

Routine septoplasty techniques seldom succeeded in improving the aesthetic outcome in cases of crooked due to difficulty in doing complete septal deviation correction and elastic memory of the deviated cartilages. Septal suturing, scoring and splinting cannot improve cases with crooked nose [10]. Boccheri used crossbar graft for correction of the deviated nasal septum [11].

In 1951, King and Ashley published the concept of extracorporeal septorhinoplasty by taking out a deviated septum from the nose, remolding it, and reinserting it back into the nose [12]. Rees [13], Jugo [14] and Most [15] popularized the use of extracorporeal septorhinoplasty in correction of crooked nose. Gubisch [16] used this technique, add valuable modifications as removal of the cartilaginous septum together with the bony septum and recommend secure attachment of the reconstructed septum to upper lateral cartilages, nasal bones and the anterior nasal spine. He also advocated the use of fixation of the implanted septum to a microplate placed at the site of anterior nasal spine and performed nasal bone osteotomies before septal implantation [17].

We performed extracorporeal septoplasty through an open approach rhinoplasty in order to have excellent visualization of the nasal structures, accurate modification of all deviated structures and stable fixation of the nasal reconstructed

septum. The use of the spreader grafts [18] together with extracorporeal septoplasty prevented postoperative collapse of the internal nasal valve and maintained the patency of the airway in our patients. We used bilateral spreader grafts in all of our patients.

Kantas et al [19] recommended that extracorporeal septoplasty should not be done in secondary rhinoplasty due to absence of available cartilage grafts and high incidence of occurrence of septal perforation. One case of our series was

revision rhinoplasty and already had a septal perforation. We used rib graft in correction of septal deviation in this case. However, the results was not satisfying to the patient. In correction of cleft lip nasal deformity, the condition of the crooked nose became more complicated by the presence of deficient premaxilla. Taub et al. reported the use of the vomer bone graft for maxillary augmentation [20]. We used vomer bone graft in two cases of cleft lip nasal deformity for correction of the alar base depression.

There are some limitation in this study including few number of patients, limited follow up period and variable indications for extracorporeal septorhinoplasty.

Conclusion

Crooked nose can be corrected by the use of extracorporeal septorhinoplasty in a safe and effective manner. Reliable functional and aesthetic improvements were obtained using this technique.

REFERENCES

1. Toriumi DM, Ries WR. Innovative surgical management of the crooked nose. *Facial Plast Clin North Am* 1993; 1:63-78.
2. Foda HMT. The Role of Septal Surgery in Management of the Deviated Nose. *Plast. Reconstr Surg.* 2005; 115: 406.
3. Byrd HS, Salomon J and Flood J. Correction of the crooked nose. *Plast Reconstr Surg* 1998; 102:2148-57.
4. Courtiss EH. Septorhinoplasty of the traumatically deformed nose. *Ann Plast Surg* 1978; 1:443-52.
5. Seyhan A, Ozden S, Gungor M, et al. A Double-Layered, Stepped Spreader Graft for the Deviated Nose. *Ann Plast Surg.* Jun 2009; 62 (6), 604-8.
6. Bocchieri A and Pascali M. Septal crossbar graft for correction of the crooked nose. *Plast Reconstr Surg.* 2003; 111:629-38.
7. Gubisch W. The extracorporeal septum plasty: a technique to correct difficult nasal deformities. *Plast Reconstr Surg.* 1995; 95:672-82.
8. Gubisch W. Extracorporeal septoplasty for the markedly deviated septum. *Arch Facial Plast Surg.* 2005; 7:218-26.
9. Jang YJ and Kwon M. Modified Extracorporeal Septoplasty Technique in Rhinoplasty for Severely Deviated Noses. *Ann Otol Rhinol Laryngol.* 2010; 119 (5), 331-5.
10. Andre RF and Vuyk HD. Reconstruction of dorsal and/or caudal nasal septum deformities with septal battens or by septal replacement: an overview and comparison of techniques. *Laryngoscope* 2006; 116:1668-73.
11. Bocchieri A. The crooked nose. *Acta Otorhinolaryngologica Italica.* 2013; 33:163-168.
12. King ED and Ashley FL. The correction of internally and externally deviated nose. *Plast Reconstr Surg* 1952; 10:116-20.
13. Rees TD. Surgical correction of the severely deviation nose by extramucosal excision of the osseocartilaginous septum and replacement as a free graft. *Plast Reconstr Surg* 1986; 78(3):320-30.
14. Jugo S. Total septal reconstruction through decortication (external) approach in children. *Arch Otolaryngol Head Neck Surg* 1987; 13:173-86.
15. Most SP. Anterior septal reconstruction: outcomes after a modified extracorporeal septoplasty technique. *Arch Facial Plast Surg* 2006; 8:202-7.
16. Gubisch W. Aesthetic and functional reconstruction after nose trauma by septum replantation. *Indian J Otolaryngol* 1984; 36:1-5.
17. Gubisch W. Treatment of the Scoliotic Nose with Extracorporeal Septoplasty. *Facial Plast Surg Clin N Am.* 2015; 23: 11-22.
18. Sheen JH. Spreader graft: A method of reconstructing the roof of the middle nasal vault following rhinoplasty. *Plast Reconstr Surg* 1984; 73:230-7.
19. Kantas I, Balatsouras DG, Papadakis CE, Marangos N, Korres SO, Danielides V. Aesthetic reconstruction of a crooked nose via extracorporeal septoplasty. *J Otolaryngol Head Neck Surg* 2008; 37:154-9.
20. Taub PJ, Lampert JA, Silver L et al. Vomer bone graft to augment the deficient cleft maxilla. *J Craniofac Surg.* 2009; 20(8 SUPPL. 2):1882-1885.