

The role of septoplasty in the management of nasal septum fracture: a randomized quality of life study

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A. Younes, S. Elzayat: *The role of septoplasty in the management of nasal septum fracture: a randomized quality of life study.* Int. J. Oral Maxillofac. Surg. 2016; 45: 1430–1434. © 2016 International Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

Abstract. Fracture of the nasal septum is a common injury. Fracture reduction using Ash forceps is the standard treatment for non-severely comminuted cases. In this study, septoplasty was compared to Ash forceps reduction of nasal septum fractures with regard to the quality of life outcome of patient breathing. Thirty consecutive patients with non-comminuted septal fractures were divided randomly into two groups. In group I, fractures were managed by closed reduction (using Ash forceps), while in group II, fractures were managed by septoplasty surgery. Each patient completed a validated quality of life scale for breathing (Nasal Obstruction Symptom Evaluation, NOSE) preoperatively and at 3 months postoperative. In group I, the mean difference between postoperative and preoperative NOSE scores was -28.33 (range -40 to -15), while in group II the mean difference was -44.33 (range -70 to -30). There was a significant improvement in nasal breathing quality of life in group II compared with group I (t -test, $P = 0.001$). The results of this study showed a significant improvement in quality of life outcome with the use of septoplasty compared to closed reduction for acute septal fractures. Septoplasty could be recommended for patients with acute nasoseptal fractures to ensure better nasal breathing outcomes.

Key words: maxillofacial trauma; craniofacial trauma; nasal trauma; septoplasty; fracture nose; nasal septum; NOSE score; quality of life.

Accepted for publication 2 June 2016
Available online 20 June 2016

Nasal trauma is a common facial injury because of the central and prominent facial position of the nasal structures. Car accidents and sports injuries are common causes of nasal trauma.¹ The nasal septum is attached to the nasal bones in the area of the perpendicular plate of the ethmoid bone. The latter is attached anteriorly to

the quadrilateral cartilage of the septum and inferiorly to the vomer. The septum gives the required support for the nasal dorsum and tip.

Fracture of the nasal septum is frequently associated with nasal trauma and may result in bilateral or unilateral nasal obstruction. The routine medical management

of the fractured septum in the emergency operating room is by closed reduction. This is a simple, rapid, and economical manoeuvre. Septoplasty surgery is recommended for severely deviated septal fractures. The reported rate of revision septoplasty or septorhinoplasty for a residual deformity is as high as 50%.^{2–4}

The hypothesis of this work is that a proper septoplasty should be done in the emergency management of a fractured nose with an associated fractured nasal septum. A proper septoplasty means that the septum is approached through a hemitransfixion incision, with the elevation of mucoperichondrial flaps, excision of septal spurs, and correction of the deviated parts. This can lead to improvements in patient quality of life outcomes regarding nasal breathing. Quality of life outcome measurement tools are increasingly used in otolaryngology. The American Academy of Otolaryngology–Head and Neck Surgery has approved the validated Nasal Obstruction Symptom Evaluation (NOSE) scale for the evaluation of nasal breathing. This scale has been used in many studies to evaluate different techniques in septoplasty.

The aim of this study was to assess patient satisfaction in terms of postoperative breathing, comparing two methods commonly used to manage fractures of the nasal septum. Patient satisfaction with breathing was determined using the validated NOSE scale developed by Stewart et al.⁵

Patients and methods

This randomized study was approved by the necessary ethics committee. The sample size was calculated considering a power of 80%, alpha of 0.05, and a minimum clinically relevant difference in NOSE score of 20. The planned sample size was 30 patients (two groups of 15 patients in each).

Inclusion criteria for the enrolment of patients were age ≥18 years, the presence

of a mild septal fracture without comminution, and patient agreement to participate in the study. Patients with open wound nasal fractures and those with severe comminuted septal fractures were excluded. A septal fracture was considered severe if it was grade IV or V in the classification of Ondik et al.⁶ It is less likely that good results will be achieved in these severe cases with a simple reduction without the septoplasty approach. Any patient who reported a history of chronic nasal obstruction prior to the nasal trauma was also excluded from the study.

Thirty consecutive patients requiring surgical management of a nasal septum fracture and meeting the inclusion criteria were enrolled in the study between 1 July 2013 and 30 June 2015. In order to be enrolled in the study, every patient had to provide signed informed consent. The consent form stated that the patient would be allocated randomly to a surgical method for the correction of their nasal septum fracture. The patients were assigned randomly to one of two groups. Randomization was done by the research coordinator by choosing a closed envelope containing details of the method of management. Blinding was not applicable.

The surgeries were performed in the otolaryngology department of a university hospital in Tanta, Egypt. All surgeries were done under general anaesthesia by the same surgeon (AY), who is a consultant in otolaryngology with particular experience in rhinoplasty. Fifteen patients were enrolled in group I and their septal fractures were managed by reduction using Ash forceps and a Boies elevator.

This was done by reducing the fractured septum with a twisting movement using the Ash forceps, or repositioning the displaced segments with the Boies elevator, without raising mucoperichondrial flaps. Fifteen patients were enrolled in group II and their septal fractures were managed by septoplasty. The septoplasty technique was as follows: after submucoperichondrial infiltration of 1/200 000 adrenaline, a hemitransfixion incision was made, following which bilateral mucoperichondrial and mucoperiosteal flaps were raised. Inferior and posterior chondrotomies were then performed, followed by excision of the deviated areas leaving at least 1–1.5 cm of L-strut. The excised deviated part was crushed and returned again between the flaps. Finally, the caudal end was fixed to the periosteum of the anterior nasal spine using a PDS 4–0 suture (Ethicon Inc., Somerville, NJ, USA) as a swinging door flap and the wound was closed with the application of septal stents for 5–7 days. The associated fractured nose was managed by reduction with Walsham forceps in 27 cases. A simple hand reduction was done in one case. The remaining two fractured noses were managed with medial and bilateral lateral osteotomies. All surgeries were done under general anaesthesia. Septal splints and external nasal splints were applied for 1 week in all cases. No major complications were recorded. Prolonged postoperative nasal crustations, up to 2 weeks, occurred in three cases in group I.

The NOSE scale (Fig. 1) was used to evaluate preoperative and postoperative

Nasal Obstruction Symptom Evaluation (NOSE) instrument

Please help us to better understand the impact of nasal obstruction on your quality of life by answering this survey. Thank you.

Over the past 1 month, how much a problem were the following conditions for you?

Please **circle** the most correct response:

	Not a problem	Very mild problem	Moderate problem	Fairly bad problem	Severe problem
1. Nasal congestion or stiffness	0	1	2	3	4
2. Nasal blockage or obstruction	0	1	2	3	4
3. Trouble breathing through my nose	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Unable to get enough air through my nose during exercise or exertion	0	1	2	3	4

Fig. 1. The NOSE score.

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