

## Quality of Life Assessment after Septoplasty

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### Abstract

#### Background:

The majority of patients with deviated nasal septum (DNS) are asymptomatic, but when they are symptomatic, surgical repair, also known as septoplasty, is the only therapy option. However, patient perceptions of the advantages of septoplasty range from complete symptom relief to total failure. For outcome analysis, a pre- and post-operative symptom evaluation is required

**Objective:** Evaluation of the effect of septoplasty on quality of life by comparing NOSE questionnaire scores pre-operatively three and six months after the surgery

#### Methods:

It is a prospective study that carried out on 75 patients. All included patients had nasal obstruction due to septal deviation and they were admitted and operated in Rizgary Teaching Hospital, Erbil/Iraq. The study carried out between Jan 2021-Jan 2022. All patients evaluated preoperatively and then some (n=45) evaluated 3 and others (n=30) evaluated 6 months after the operation using NOSE questionnaire

#### Results:

Out of the 75 patients enrolled in the study, male to female ratio was 1.6:1. The patients mean age was 28.8 (range: 17 - 54) years. In post 3 months follow up of patients, a statistically significant improvement was found when comparing preoperative NOSE score (mean =58.8) with post 3 months NOSE score (mean= 23.0), (P. value <0.001). Also a statistically significant improvement was reported at 6 months follow up of patients when comparing preoperative NOSE score (mean=58.8) with post 6 months NOSE score (mean = 30.0), (P. value <0.001).

#### Conclusion:

Septoplasty is an effective surgical method in the management and improvement of quality of life for patients with nasal obstruction due to nasal septal deviation.

**Keywords:** Nasal obstruction , Septoplasty, Quality of Life , Nose score

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## 1. INTRODUCTION

The nasal septum performs a variety of roles, such as dividing the nasal passage into two separated cavities supporting the dorsal aspect, rather than maintaining the columella shape and tip of the nose (1). Humans normally breathe through their noses. The passage of the air through the nose accounts for about half of resistance of the airway, which is necessary for proper physiology of the respiratory system (2). Nasal obstruction refers to the sensation of a blockage or insufficient airflow via the nose and it can have a substantial influence on a person's quality of life (QL). It is found in 26.7 percent of urban centers (3). Poor airflow can result in a reduction in oxygen inflow, as well as poor olfaction, humidification, and filtration of the passing air (1). Nasal blockage can be caused by a variety of factors, including rhinitis, adenoid hypertrophy, turbinate hypertrophy, and sinonasal polyps. Nasal septum deviation is a common cause of nasal obstruction that is easy to diagnose and is corrected with septoplasty (3). Chronic sinus disease can be caused by anatomic septal deviation, which can potentially contribute to an external nose deformity. Nasal airway obstruction and aesthetic deformities can result from traumatic deviation or developmental anomalies of the nasal septum (1). Nasal septum deviation is a common cause of unilateral nasal airway obstruction and can occur as a result of nasal and midfacial trauma. Trauma at birth, such as the use of forceps or passage via a narrow pelvic canal, can result in injuring the septum, which can lead to early septal deviation or deviation that is not visible until later in adolescence. Minor damage received early in childhood frequently results in microfractures of the septal cartilage, which repair to cause the cartilage to bend away from the side of injury. When this happens early in childhood, chondrocyte formation might be disrupted, resulting in asymmetric growth of the entire nasal structure (4). Overgrowth of the inferior turbinate, which takes up a lot of space in the contralateral nasal cavity, is commonly accompanied with a deviated nasal septum to one side. Many experts suggest that compensatory hypertrophy regresses on its own after septoplasty. Other writers, on the other hand, suggest that turbinate hypertrophy affects both bone and mucosa, and that these alterations are not reversible and should be treated in combination with nasal septal surgery (5). The majority of DNS patients are asymptomatic, but when they are symptomatic, surgical repair,

also known as septoplasty, is the only therapy option. However, patient perceptions of the advantages of septoplasty range from complete symptom relief to total failure. For outcome analysis, a pre- and post-operative symptom evaluation is required (6). Objective and subjective tools can be used to determine nasal airway patency or resistance (1). Rhinomanometry and Acoustic Rhinometry can be used to objectively determine the severity of nasal blockage. However, majority of the times, patient's pre- and post-operative complaints are shown to be unrelated to physical findings and objective measures. Because the patient's impression of nasal airflow is of key importance, an improvement in the patient's subjective score of symptoms is unquestionably a significant outcome parameter of the therapeutic plan for addressing the problem. In 2004, Stewart et al. established the NOSE (Nasal Obstruction & Symptom Evaluation) scale. This is a disease-specific quality-of-life measure for assessing nasal obstruction subjectively. It comes in the form of a questionnaire with five symptoms that progress in intensity (6). The purpose of this study is to see how septoplasty affects the disease-specific quality of life of individuals who have nasal obstruction due to a nasal septum deviation (3).

## **2. METHODOLOGY**

This was a prospective study that carried out on a total of 82 patients, of whom 7 were missed in the follow up and excluded because they didn't completed the survey, the remaining 75 patients enrolled into the study. The patients complained of nasal obstruction due to nasal septal deviation and are admitted to Rizgary Teaching Hospital, Erbil/Iraq, from January 2021 to January 2022.

### **Inclusion criteria:**

1. Adult patients aged 18 years and above.
2. Patients with chronic nasal obstruction caused by nasal septum deviation with or without nasal conchae hypertrophy.
3. Symptoms persisting for over 12 weeks.
4. No response to the clinical treatment with topical steroids and anti-histaminic agents associated with nasal decongestants (only for patients with concurrent allergic rhinitis),
5. Surgical indication for septoplasty

**Exclusion criteria:**

1. Patients with a history or diagnosis of sinonasal tumors
2. Head and neck radiotherapy.
3. Septoplasty done with rhinoplasty or as an entry point to other sites.
4. Patients with one or more of the following were also excluded; anterior nasal surgery; chronic rhinosinusitis; nasal septum perforation; craniofacial congenital bone changes; nasal trauma or fracture; adenoid hypertrophy; sarcoidosis or another granulomatosis; asthma without clinical control; gestation.

**Study protocol and procedure**

All patients evaluated preoperatively using NOSE questionnaire, then patients underwent Septoplasty operation. They divided into two groups; a group evaluated 3 months and the other group 6 months after the operation. The evaluation was to observe the effect of surgery on the disease specific quality of life by correlating preoperative score and postoperative improvement.

**Data analysis:**

Data were entered and analyzed using statistical package for social sciences (SPSS) version 28. Data presented as mean, standard deviation, frequency and percentage according to the type of variables. Appropriate statistical tests were applied accordingly at level of significance of P. value  $\leq 0.05$  considered to be significant.

**3. RESULTS**

This study included seventy five patients with nasal obstruction following septoplasty presented with a mean age of (28.8 years) and range of 17-54 years; 22.7% of patients were in age group <20 years, 36% of them were in the age group 20-29 years, 33.3% of them were in the age group 30-39 years and 8% of them were in the age group of 40 years and more. Male patients were more than females with a male to female ratio of 1.6:1. (Table 1). The nasal obstruction symptom evaluation (NOSE) score before septoplasty for studied patients regarding nasal congestion or stuffiness, nasal blockage or obstruction, trouble breathing through my nose, trouble sleeping and unable to get enough air through my nose during exercise or exertion were (12.5, 16.3, 13.3, 7 and 9.5, respectively), while for the 3 months postoperative patient (n = 45) following septoplasty, the nasal congestion or stuffiness, nasal

blockage or obstruction, trouble breathing through my nose, trouble sleeping and unable to get enough air through my nose during exercise or exertion scores were (9.1, 6.6, 6.3, 0.11 and 0.78, respectively) with an obvious significant decline ( $p < 0.001$ ). The mean total NOSE score of patients with nasal obstruction was (58.8) that significantly declined to (23) three months after septoplasty ( $< 0.001$ ). (Table 2 and Figure 1). For the 6 months post-operative group ( $n=30$ ), the nasal congestion or stuffiness, nasal blockage or obstruction, trouble breathing through my nose, trouble sleeping and unable to get enough air through my nose during exercise or exertion scores were (7.8, 5.6, 5.3, 5 and 6.1, respectively) with an obvious significant decline ( $p < 0.001$ ). The mean total NOSE score of patients with nasal obstruction was (58.8) that significantly declined to (30) six months after septoplasty ( $< 0.001$ ). (Table 3 and Figure 2).

Table 1. Demographic characteristics of patients underwent septoplasty.

Variable		No.	%
Age (year)	<20	17	22.7
	20-29	27	36.0
	30-39	25	33.3
	$\geq 40$	6	8.0
	Mean (SD): 28.8 (8.4)		
Gender	Male	47	62.7
	Female	28	37.3

SD: standard deviation of mean

Table 2. Nasal obstruction symptom evaluation pre and post-3-months after septoplasty.

Parameters	Preoperative	Post -3 months	P. value*
	Mean ± SD	Mean ± SD	
Nasal congestion or stuffiness	12.5 ± 3.8	9.1 ± 3.4	<0.001
Nasal blockage or obstruction	16.3 ± 3.2	6.6 ± 3.9	<0.001
Trouble breathing through my nose	13.3 ± 3.8	6.3 ± 2.9	<0.001
Trouble sleeping	7 ± 3.4	0.11 ± 0.74	<0.001
Unable to get enough air through my nose during exercise or exertion	9.5 ± 4.7	0.78 ± 1.8	<0.001
Total NOSE score	58.8 ± 14.6	23 ± 9	<0.001

SD: standard deviation of mean

\*P. value is significant in all comparisons

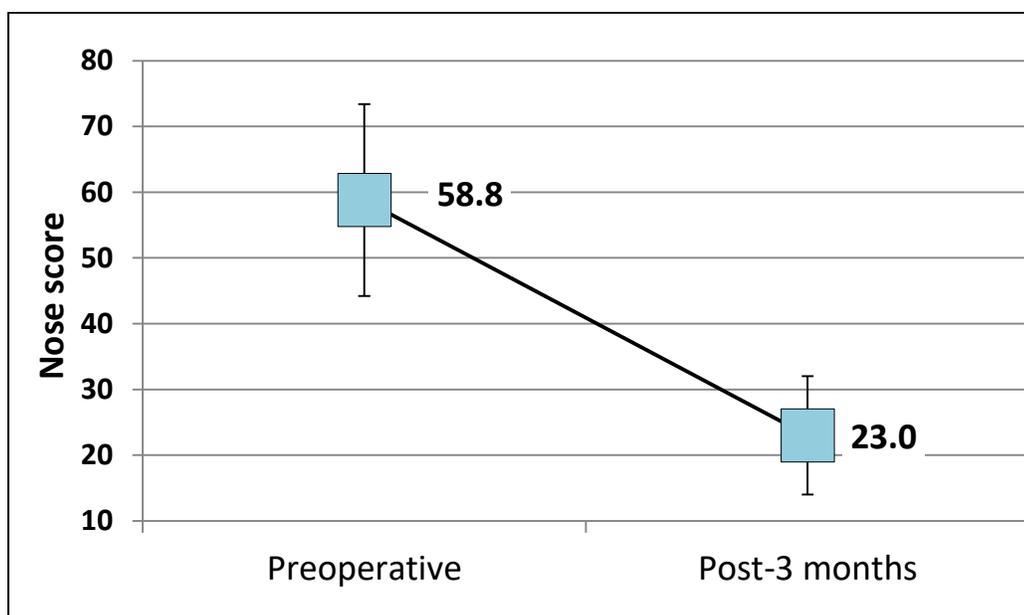


Figure 1. Total NOSE score pre and Post-3 months after septoplasty.

Table 3. Nasal obstruction symptom evaluation pre and Post-6 months after septoplasty.

Parameters	Preoperative	Post -6 months	P. value*
	Mean $\pm$ SD	Mean $\pm$ SD	
Nasal congestion or stuffiness	12.5 $\pm$ 3.8	7.8 $\pm$ 5.2	<0.001
Nasal blockage or obstruction	16.3 $\pm$ 3.2	5.6 $\pm$ 5.3	<0.001
Trouble breathing through my nose	13.3 $\pm$ 3.8	5.3 $\pm$ 4.7	<0.001
Trouble sleeping	7.0 $\pm$ 3.4	5.0 $\pm$ 5.7	<0.001
Unable to get enough air through my nose during exercise or exertion	9.5 $\pm$ 4.7	6.1 $\pm$ 4.8	<0.001
Total NOSE score	58.8 $\pm$ 14.6	30 $\pm$ 22.4	<0.001

SD: standard deviation of mean

\*P. value is significant in all comparisons

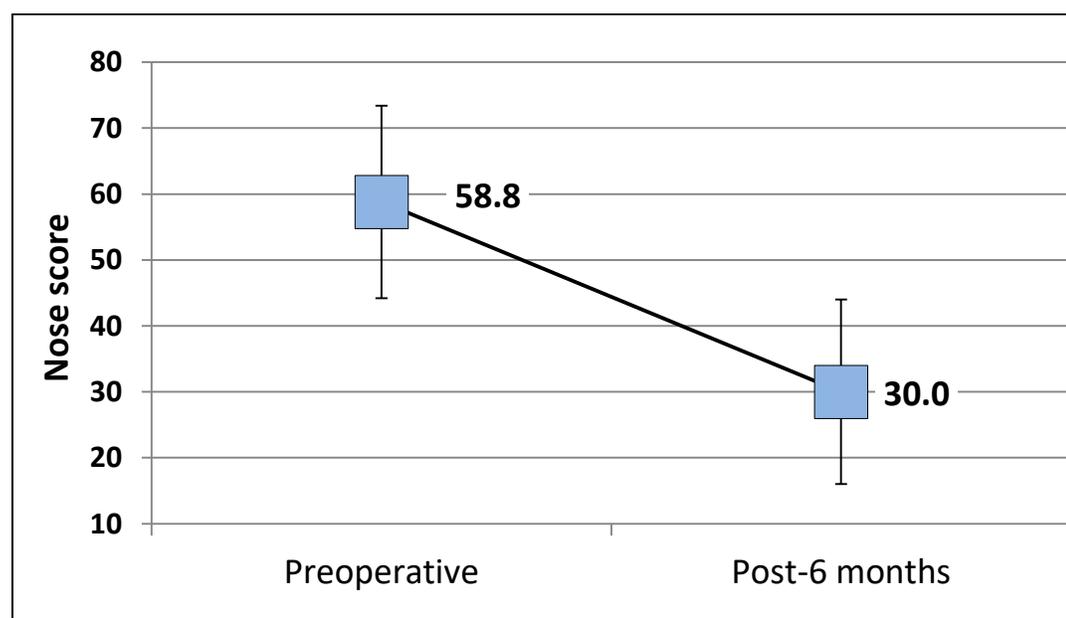


Figure 2. Total NOSE score pre and Post-6 months after septoplasty.

#### 4. DISCUSSION

Although the important role of septoplasty in nasal obstruction, the benefits of this surgical operation is questionable and many health authorities recommended further studies in evaluating the outcomes of septoplasty (8,9). The present study showed that mean age of studied patients underwent septoplasty in Erbil city was (28.8 years). This mean age is close to that of (26.9 years) reported by Abbas and Tawfique prospective case series study (10) in Erbil city (Kurdistan/Iraq) for patients underwent septoplasty. It was shown that septoplasty could be implemented successfully in all age groups, but the satisfaction in outcomes was declined with increasing the age of patients (11). In present study, male gender patients underwent septoplasty was prevalent. This finding is similar to results of Alotaibi et al. (12) study in Saudi Arabia which found that about two thirds of patients presented for septoplasty were males. Despite the discussions regarding anatomical differences between both genders, Gillanders et al. (13) study in Turkey revealed no statistically significant differences in preoperative symptom, symptoms changes and satisfaction between male and female patients underwent septoplasty.

In the current study, the means of evaluating symptoms preoperatively for studied patients were significantly declined at 3 months after septoplasty ( $p < 0.001$ ). These findings are in agreement with results of Gandomi et al. (14) study in Iran which revealed a significant decline in symptoms scores used in septoplasty evaluation (NOSE score parameters) three months following septoplasty. Our study found that mean total NOSE score of patients with nasal obstruction was (58.8) that significantly declined to (23) three months after septoplasty ( $< 0.001$ ). This finding is consistent with results of Shrestha et al. (15) study in Nepal on 52 adult patients underwent septoplasty alone which reported a significant decline in mean total NOSE score for patients three months following septoplasty. In Brazil, a study carried out by Resende et al. (16) reported a significant decline in NOSE score three months after implementing septoplasty with bilateral out fracture of the inferior turbinate.

In the present study, the means of evaluating symptoms preoperatively for studied patients were significantly declined 6 months after implementing septoplasty ( $p < 0.001$ ). This finding coincides with results of Hsu et al. (17) retrospective individual cohort study in Taiwan which

revealed a significant decline in symptoms evaluation scores 6 months after implementing septoplasty and stated also that subjective and objective symptoms of nasal obstruction had improved one year following septoplasty alone. Our study showed that mean total NOSE score of patients with nasal obstruction was (58.8) that significantly declined to (30) six months after septoplasty (<0.001). This finding is similar to results of Valsamidis et al. (18) prospective observational study in Greece which reported that septoplasty is accompanied by increasing nasal patency and a significant decline of nasal obstruction symptoms score (NOSE score) six months after septoplasty. In our study, a slight increase was observed in mean total NOSE score between three and six month's evaluation periods. Alotaibi et al. (19) study in Saudi Arabia documented that better quality of life following septoplasty begins three months following septoplasty but ultimate benefit may occur after one year. However, Kuduban et al. (20) study in Turkey revealed that patients' dissatisfaction might affect their symptoms perception after septoplasty.

## 5. CONCLUSIONS

This study concluded that septoplasty is accompanied by good short and long term quality of life improvement. The nasal obstruction symptoms evaluation scores for patients are declined three and six months following septoplasty. Encouraging surgeons to use this tool in their scheduled evaluation of septoplasty as it is reliable and responsive instrument that is brief and easy to complete and has potential use for outcome studies in adults with nasal obstruction due to septal deviation.

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**Ethical Clearance:**

All ethical issues approved by authors. Confidentiality and anonymity of data were ensured. Patients enrollment and data collection were in accordance with the [World Medical Association \(WMA\), declaration of Helsinki](#), The Ethical Principles for Medical Research Involving Human Subjects, 2013

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