

Subjective Assessment of Outcomes of Septoplasty

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ABSTRACT

Septal deviation is the leading cause of chronic nasal obstruction. The procedure of choice for treating these patients is septoplasty. We aimed at assessing the disease-specific quality-of-life outcomes of septoplasty by means of a questionnaire.

Ours was a retrospective study where 100 patients who underwent septoplasty between 2014 and 2015 in the Department of Otorhinolaryngology were analyzed. A modification of the nasal obstruction symptom evaluation (NOSE) scale was used to compare the pre- and postoperative symptoms.

We found that nasal obstruction was seen in all patients. A significant improvement was seen in all symptoms of the modified NOSE scale. An improvement in the general condition of the patients was seen postsurgery.

The modification in the NOSE scale addresses a wider range of symptomatology and is a good tool for subjective assessment of septoplasty.

Keywords: Nasal obstruction, Nasal obstruction symptom evaluation scale, Septoplasty.

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INTRODUCTION

Nasal obstruction is a common presenting complaint in the field of otolaryngology. Its prevalence is 26.7% in urban centers.¹ It can be due to septal deviation, turbinate hypertrophy, adenoid hypertrophy, and nasal polyposis. Septal deviation is one of the most common causes of nasal obstruction and can only be corrected surgically.

The outcome after nasal surgery can be assessed subjectively or objectively. There is no agreement on the tool for objective assessment of nasal obstruction.²⁻⁵ At present, in agreement with the guidelines of the "Oxford Centre for Evidence-based Medicine," there is no basis to

attribute more importance to the value of objective outcomes over subjective patency symptoms either in routine rhinologic practice or for the evaluation of therapeutic interventions. Hence, there is only limited justification for the use of rhinomanometry or acoustic rhinometry.⁶ The NOSE scale for subjective assessment of treatment outcome was developed by Stewart et al⁷ as a part of a prospective multicenter study published in 2004.

Septal surgery is performed for reasons apart from nasal obstruction, such as access to nasal sinus tumors, pituitary surgery, and a part of sleep apnea treatment. These patients were excluded and only those with nasal obstruction were analyzed.

The aim of this study was to compare the outcome of nasal septal surgery with available published standards and compare a number of different outcome measures in the evaluation of nasal surgery.

MATERIALS AND METHODS

Study Design

This is a retrospective study where 100 patients who underwent septoplasty between 2014 and 2015 in the Department of Otorhinolaryngology were analyzed. The NOSE scale assesses the presence of nasal congestion or stuffiness, nasal obstruction, trouble breathing through the nose, trouble sleeping, and inability to get enough air through the nose during the exercise of exertion (Table 1). In our modification of the NOSE scale, additional questions were added, which included presence of snoring, poor sense of smell, feeling panicky that enough air is not entering the nose, irritation in the throat, nocturnal

Table 1: Nasal obstruction symptoms evaluation scale

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

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Table 2: Statistical analysis of our observation

		<i>n</i>	Mean (SD)	Min	Max	Median (Q1–Q3)	Z	<i>p</i> -value
Nasal obstruction	Pre	100	3.07 (0.82)	1	4	3 (3–4)	-8.34	<0.001*
	Post	100	0.87 (0.94)	0	4	1 (0–1)		
Sense of smell	Pre	100	0.58 (1.12)	0	4	0 (0–1)	-3.68	<0.001*
	Post	100	0.20 (0.51)	0	3	0 (0–0)		
Snoring	Pre	100	1.21 (1.39)	0	4	0.50 (0–2)	-5.38	<0.001*
	Post	100	0.42 (0.86)	0	4	0 (0–1)		
Trouble sleeping	Pre	100	1.12 (1.37)	0	4	0.50 (0–2)	-5.50	<0.001*
	Post	100	0.35 (0.74)	0	3	0 (0–0)		
Unable to get air	Pre	100	0.98 (1.27)	0	4	0 (0–2)	-4.97	<0.001*
	Post	100	0.33 (0.67)	0	3	0 (0–0)		
Feeling panic	Pre	100	0.69 (1.27)	0	4	0 (0–1)	-4.52	<0.001*
	Post	100	0.12 (0.38)	0	2	0 (0–0)		
Throat irritation	Pre	100	0.81 (1.29)	0	4	0 (0–1)	-3.35	0.001*
	Post	100	0.46 (0.99)	0	4	0 (0–0.75)		
Nocturnal cough	Pre	100	0.56 (1.11)	0	4	0 (0–1)	-3.89	<0.001*
	Post	100	0.22 (0.58)	0	3	0 (0–0)		
Common cold	Pre	100	2.21 (1.49)	0	4	2 (1–4)	-6.60	<0.001*
	Post	100	1.02 (0.97)	0	4	1 (0–2)		
Daytime sleepiness	Pre	100	0.55 (1.19)	0	4	0 (0–0)	-3.02	0.003*
	Post	100	0.25 (0.70)	0	4	0 (0–0)		
Blocking sensation in ear	Pre	100	0.46 (1.03)	0	4	0 (0–0)	-1.95	0.051 (NS)
	Post	100	0.32 (0.86)	0	4	0 (0–0)		
General health	Pre	100	1.26 (1.30)	0	4	1 (0–2)	-5.39	<0.001*
	Post	100	0.55 (0.89)	0	4	0 (0–1)		
Headache	Pre	100	1.19 (1.55)	0	4	0 (0–2.75)	-4.29	<0.001*
	Post	100	0.57 (1.07)	0	4	0 (0–1)		
Bleeding from nose	Pre	100	0.14 (0.70)	0	4	0 (0–0)	-2.07	0.04*
	Post	100	0.03 (0.30)	0	3	0 (0–0)		

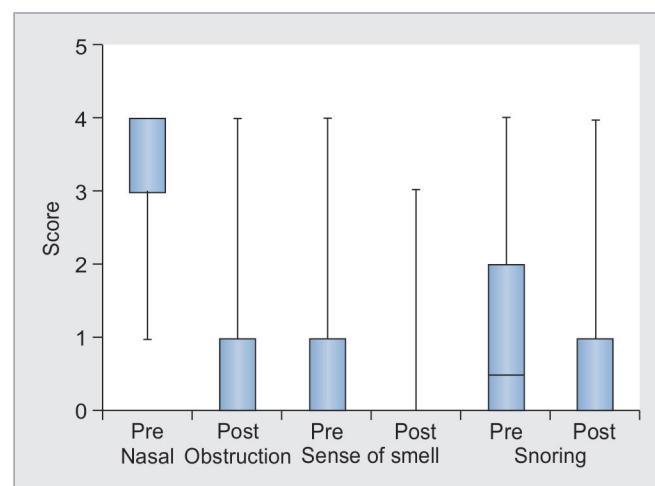
Wilcoxon signed-rank test; * $p < 0.05$, statistically significant; $p > 0.05$; NS: Nonsignificant; SD: Standard deviation

cough, frequency of common cold, daytime sleepiness, blocked sensation in the ear, general health condition, headache, and epistaxis. Inclusion criteria for the study were as follows: Age at least 18 years; septal deviation causing chronic nasal obstruction; and symptoms lasting at least 3 months. Exclusion criteria were septoplasty performed with concurrent sinus surgery, sleep apnea surgery, and rhinoplasty; sinonasal malignancies; septoplasty done for access to other sites; nasal fracture; adenoid hypertrophy; history of chronic sinusitis; prior nasal surgery; and uncontrolled asthma.

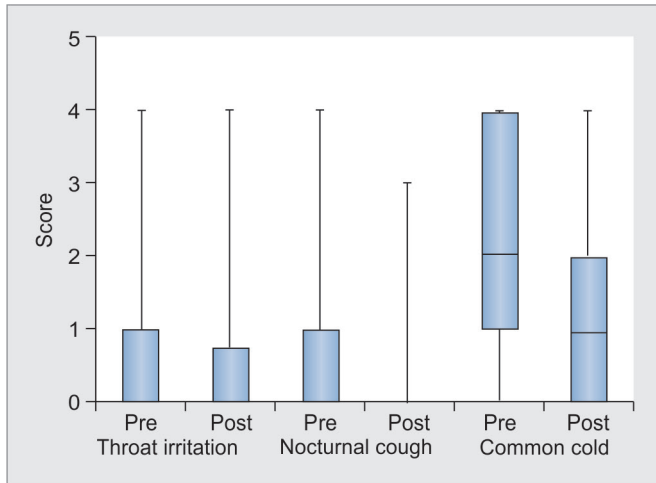
RESULTS

A total of 100 patients were included in the study. Mean age of the patients was 36 years. Of them, 83 were males and 17 were females. The modified NOSE scale was used to assess the severity of symptoms. A score of 0 to 4 was given for each symptom, 4 being the most severe. Nasal obstruction was seen in all patients. Wilcoxon signed-rank test was used to analyze the data. A change in the distribution of the median was seen postsurgery (Table 2). Preoperative mean score for nasal obstruction was 3.7 and a significant improvement was seen postoperatively, with the

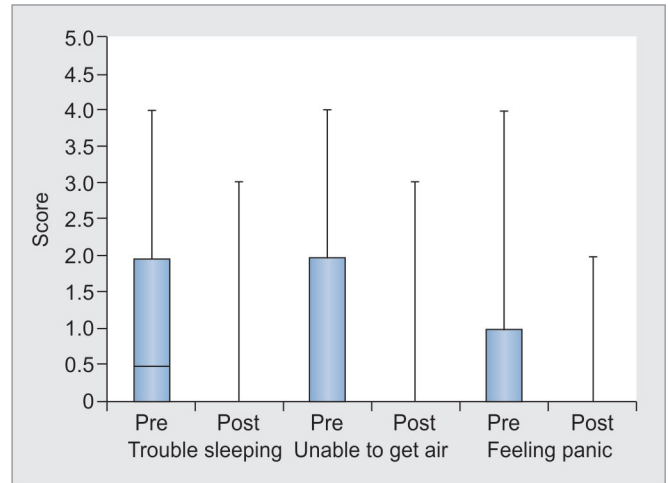
score being 0.87 (p -value < 0.001 ; Graph 1). The mean preoperative score was frequency of common cold at 2.21 and postoperative was 1.02 (Graph 2). Snoring reduced from a score of 1.21 to 0.42. An improvement in the general health was seen, with a preoperative score of 1.26 and postoperative score of 0.55. The other symptoms analyzed were poor sense of smell, trouble sleeping, inability to get air through



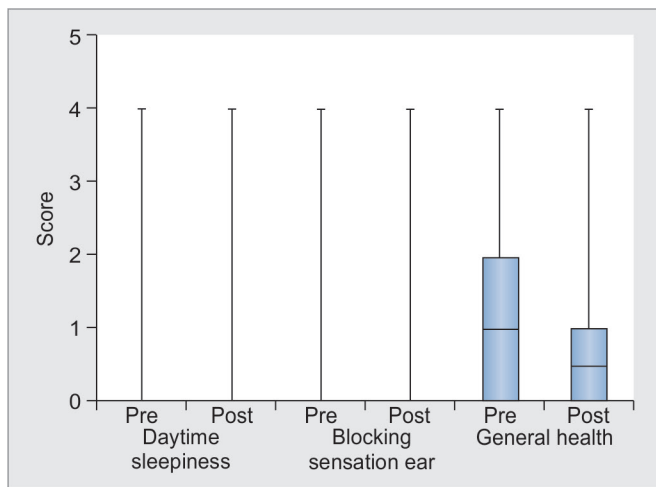
Graph 1: Comparison between preoperative and postoperative symptoms of nasal obstruction, sense of smell, and snoring



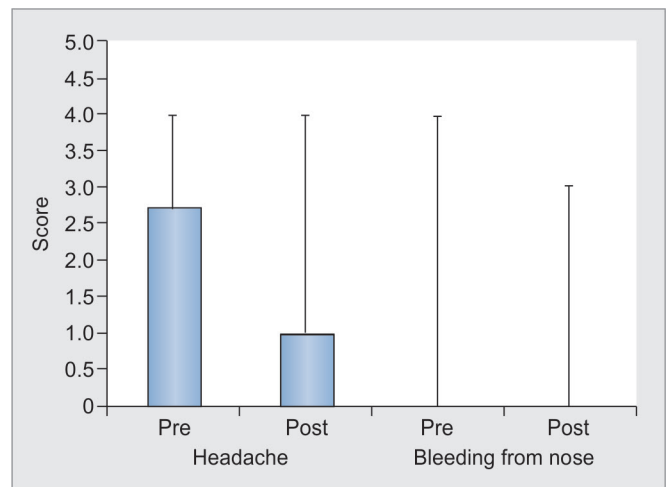
Graph 2: Comparison between preoperative and postoperative symptoms of throat irritation, nocturnal cough, and common cold



Graph 3: Comparison between preoperative and postoperative symptoms of trouble sleeping, unable to get air, and feeling of panic



Graph 4: Comparison between preoperative and postoperative symptoms of daytime sleepiness, blocking sensation of ear, general health



Graph 5: Comparison between preoperative and postoperative symptoms of headache and bleeding from nose

the nose during exercise or exertion, feeling panicky that enough air is not getting into the nose, irritation in the throat, nocturnal cough, daytime sleepiness, blocked sensation in the ear, headache, and epistaxis (Graphs 3 to 5).

DISCUSSION

Patients' perspective of nasal obstruction depends on many psychological and physiological factors. Operative techniques, condition of vascular and nerve supply, and expectation of the patient play a major role in the assessment of satisfaction level postseptoplasty.⁸

Postoperative physical examination and objective tools have been used in previous studies to assess the effectiveness of septoplasty.⁹ However, these have drawbacks. Physical examination is subjective and depends on the examiner's perspective, whereas objective tools have a little role in clinical setting.^{3,10}

The NOSE scale is a disease-specific instrument used to assess nasal obstruction in groups of patients. It can be

used to compare the effect of medical *vs* surgical therapy. It can assess the outcome of different surgical procedures. The NOSE scale can compare symptom severity between different groups of patients.⁷

Stewart et al¹⁰ reported that patients undergoing septoplasty have very significant improvement in nasal obstruction at 3 months, and this result is sustained at 6 months after surgery.

Similar results were obtained by Gandomi et al.¹¹ They also stated that younger patients who have nasal obstruction with septal deviation benefit more from septoplasty. Nasal obstruction of these patients may be more anatomically dependent, so this group may gain more success from surgery; and in older patients, dynamic causes may be more important.

A study done by Arunachalam et al¹² found 74% improvement in nasal obstruction postseptoplasty. The Fairley nasal symptom score was used to assess the postoperative nasal symptoms. General quality-of-life

measured using the Nottingham health profile and general health questionnaire found no significant improvement. Grymer and Rosborg,¹³ in a retrospective study of 42 patients, noted that alar insufficiency accounted for lack of postoperative improvement in nasal obstruction.

Kahveci et al¹⁴ studied the efficiency of NOSE scale to assess for septoplasty results and the correlation between NOSE scores and visual analog scale for examination findings, acoustic rhinometry, and coronal computed tomography. There was no correlation between NOSE scores and acoustic rhinometry. Rhinometry can only show volume and area changes inside of the nose. Its clinical use is limited. Correlation was found between NOSE scores and examination and computed tomography findings.

There are other disease-specific quality-of-life questionnaires available to assess nasal complaints, but none of them is specific to assess the nasal obstruction only: the "Sino-Nasal Outcome Test (SNOT-20)",¹⁵ the "Chronic Sinusitis Survey (CSS)",¹⁶ the "Rhinosinusitis Disability Index (RSDI)",¹⁷ the "Rhino-conjunctivitis Quality of Life Questionnaire (RQLQ)",¹⁸ and the "Allergy Outcome Survey (AOS)".¹⁹ The CSS, the RSDI, and the SNOT-20 were made to assess the chronic rhinosinusitis, just as the RQLQ and the AOS for allergic rhinoconjunctivitis.

Persistence of nasal obstruction following septoplasty can be due to various factors. It is seen that 42% of the population have septal deviation with compensatory turbinate hypertrophy. However, only 25% of these patients suffer from nasal obstruction.²⁰ This indicates that not every nasal obstruction coming along with septal deviation is due to the deviation. Other factors like concha bullosa or protruding inferior concha can also act as breathing barriers.²¹ Insufficient nasal valve functioning that is not diagnosed prior to surgery can also contribute to the persistence of nasal obstruction.²²

In our study, a significant improvement was seen in all symptoms of the modified NOSE questionnaire except for blocked sensation in the ear. This can be due to the fewer number of patients complaining of blocked sensation in the ear preoperatively. The most common presenting complaint was nasal obstruction, which was seen in all patients. A significant improvement was seen in the general condition of the patient following surgery. A limitation of this study is a lack of control group. However, as there is no alternative management for a deviated nasal septum apart from surgery, a nonsurgical control group is not possible.

CONCLUSION

In patients with septal deformity, significant improvement was seen following septoplasty. A high patient

satisfaction and decreased medication use were noted in a majority of patients. The modification in the NOSE scale addresses a wider range of symptomatology and is a good tool for subjective assessment of septoplasty.

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