

ASSESSMENT OF SEPTOPLASTY OUTCOME USING NASAL OBSTRUCTION SYMPTOM EVALUATION SCALE

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ABSTRACT

Nasal obstruction, the most common presenting symptom in nasal and sinus disease, is defined as patient discomfort manifested as a sensation of insufficient airflow through the nose. Nasal septal deviation is the most common anatomical cause of nasal obstruction. Surgical correction of a deviated septum, nasal septoplasty, is the definitive treatment for septal deviation. Many studies have discussed about outcomes of septoplasty. However, there is limited published literature on nasal septoplasty and its outcome in Nepal. The aim of this study is to evaluate the outcome of septoplasty using Nasal Obstruction Symptom Evaluation (NOSE) scale, a validated outcome instrument assessing quality of life (QoL) related to nasal obstruction. A total of 52 patients aged 18 years and above, with nasal obstruction at least for 3 months, undergoing septoplasty alone were included in the study. Baseline NOSE score was calculated a week before surgery. The patients were followed up after 3 months to record postoperative NOSE score. On statistical analysis, the mean NOSE scores before and 3 months after septoplasty were 45.58 ± 21.38 and 8.46 ± 8.37 respectively. The mean difference was 37.11 ± 21.22 and p value on paired t test was less than 0.001 (highly significant). The mean differences of each component of the NOSE scale questionnaire were also found to be highly significant statistically with p values less than 0.001. Gender and age did not seem to affect the outcomes. In conclusion, NOSE scale is a valid, reliable and responsive instrument that is brief and easy to complete and has potential use for outcome studies in adults with nasal obstruction. This instrument showed that septoplasty, if done in properly selected patients, results in significant improvement in nasal obstruction and disease specific quality of life with high patient satisfaction.

KEYWORDS

Septoplasty, nasal obstruction, NOSE scale

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INTRODUCTION

Nasal obstruction is the most common presenting symptom in nasal and sinus disease.¹ It is commonly defined as patient discomfort manifested as a sensation of insufficient airflow through the nose.² The etiology of nasal obstruction is generally divided into mucosal and anatomical causes. Nasal septal deviation is the most common anatomical cause of nasal obstruction.³ About 80% of the general population has a deviated nasal septum to some degree.⁴ Other common causes include mucosal congestion, turbinate hypertrophy, adenoid hypertrophy and nasal mass. Surgical correction of a deviated septum, nasal septoplasty, is the definitive treatment for septal deviation.^{5,6} It is also the most common ear, nose and throat (ENT) operation in adults.⁷

Nasal septal deviation may be congenital, as a part of a damaging process during in-utero development or during birth, or acquired, as a result of a traumatic impact in childhood or adult life. Childhood trauma brings more damage to the growing septum. These patients may present with a history of sinusitis, allergic rhinitis, obstructive sleep apnoea, atypical facial pain, previous nasal surgery or recent nasal trauma. They often complain of unilateral or bilateral nasal obstruction that is not relieved with nasal decongestants or steroid nasal sprays.⁸ If there is a visible nasal septal deviation with no other identifiable causes, septoplasty needs to be done in them. The indications for septoplasty vary. Nasal obstruction, crusting, rhinorrhea, postnasal discharge, recurrent sinus pressure or pain, epistaxis, headache, snoring and sleep apnoea are mentioned as indications for septoplasty.⁹ It can also be done to provide an access for FESS, as a part of cosmetic rhinoplasty and to access a pituitary tumour via the nose.

Many studies have discussed about outcomes of septoplasty.¹⁰⁻¹⁶ However, there is limited published literature on nasal septoplasty and its outcome in Nepal. This study attempts to fill that void. The aim of this study is evaluation of septoplasty outcome using NOSE (Nasal Obstruction Symptom Evaluation) scale. The NOSE scale is a validated outcome instrument assessing quality of life (QoL) related to nasal obstruction (Table 1).^{5,6}

MATERIAL AND METHODS

This prospective study was carried out at the department of Otolaryngology Head and Neck Surgery, Nepal Medical College and Teaching Hospital (NMCTH), Attarkhel, Kathmandu, Nepal from July 2017 to December 2018. Ethical approval was taken from the Institutional Review Committee (IRC) of NMCTH. Prior informed written consent was taken from all the subjects participating in the study. Inclusion criteria were as follows: at least 18 years old, septal deviation consistent with nasal obstruction at least for 3 months, persistent symptoms even after 4 weeks of medical management with nasal steroid, antihistaminic and/or oral decongestants. Exclusion criteria were as follows: sinonasal malignancy, septoplasty done along with other surgeries such as endoscopic sinus surgery, nasal valve surgery, turbinate surgery or as an approach to pituitary tumours, sinonasal infections, sinonasal inflammatory disease, prior nasal surgery, septal perforation, craniofacial syndrome, nasal trauma, fracture, adenoid hypertrophy and coexisting debilitating diseases/major systemic diseases. The consultant faculty members decided for indication of septoplasty operation with patients by doing a complete ENT examination. Baseline NOSE score was calculated a week before surgery. The patients were followed up for a minimum period of 3 months to record postoperative symptom improvement rate by NOSE scale at the end of 3 months. The results of our study were analyzed on SPSS-17 using "paired t test".

RESULTS

A total of 52 patients were included in the study of which 31 (59.6%) were males while 21 (40.4%) were females with male to female ratio of 1.4:1. Genderwise, the preoperative NOSE score was more in females (48.33 ± 22.93) compared to males (43.71 ± 20.45). Both males and females showed statistically significant improvement in mean NOSE scores after septoplasty with p values less than 0.001 for both groups while applying paired t test (Table 2).

Table 1: The NOSE scale

Over the past one month, how much of a problem were the following conditions for you? Please circle the most correct response					
	Not a problem	Very mild problem	Moderate problem	Fairly severe problem	Severe problem
1. Nasal congestion or stuffiness	0	1	2	3	4
2. Nasal blockage or obstruction	0	1	2	3	4
3. Trouble breathing through nose	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Unable to get enough air through nose during exercise or exertion	0	1	2	3	4

Table 2: Genderwise comparison of NOSE scores before and 3 months after septoplasty

Gender	Preoperative Mean±SD	Postoperative Mean±SD	Difference Mean±SD	p value
Males (n=31)	43.71±20.45	6.94±8.33	36.77±21.03	<0.001
Females (n=21)	48.33±22.93	10.71±8.10	37.61±22.00	<0.001
Total=52				

Table 3: Agewise comparison of NOSE scores before and 3 months after septoplasty

Age range	Preoperative Mean±SD	Postoperative Mean±SD	Difference Mean±SD	p value
≤30 years (n=34)	44.85±20.76	7.21±7.99	37.64±21.71	<0.001
31 to 45 years (n=11)	41.82±26.29	9.09±8.89	32.72±22.06	0.001
>45 years (n=7)	55±15.27	13.57±8.52	41.42±19.08	0.001
Total=52				

The ages of patients ranged from 19 to 60 years with a mean age of 30.3±10.9 years. Majority of the patients (65.4%) were below 31 years. The mean NOSE score before septoplasty was highest in >45 years age group (55±15.27). All three age groups (<30 years, 31 to 45 years and >45 years) showed statistically significant improvement in mean NOSE scores after septoplasty (Table 3).

The overall preoperative NOSE scores of all the patients were compared to the post-operative NOSE scores to know the functional outcome of the surgical procedure. On statistical analysis, the mean NOSE scores before and 3 months after septoplasty were 45.58±21.38 and 8.46±8.37 respectively. When paired t test was calculated, the mean difference was 37.11± 21.22 and t value was 12.61 which was highly significant (p < 0.001). The mean differences of each component of the NOSE scale questionnaire were also compared before and after surgery and were found to be highly significant statistically with p values less than 0.001 for all the components (Table 4).

DISCUSSION

Septoplasty is a surgical procedure done to correct the deviated nasal septum. At present, otorhinolaryngologists usually consider nasal obstruction to be the chief indication to perform septoplasty. Although the literature shows a prevalence of nasal septal deviation in up to 80 % of population, in clinical practice, however, only a minority of individuals is actually found to suffer from nasal obstruction. Literature also suggests that there are not many scientific publications on the effects of septoplasty and most of them are inconclusive indicating that there is paucity of hard evidence as to whether this procedure actually provides any benefit to the patient.¹⁷ Currently, the effectiveness of septoplasty in adults with nasal obstruction and a deviated nasal septum remains uncertain.

Nasal complaints can be assessed by many disease-specific QoL questionnaires available in literature like the "Chronic Sinusitis Survey (CSS)",

Table 4: Comparison of components of NOSE score before septoplasty and at 3 months follow up

Components of NOSE	Preoperative Mean±SD	Postoperative Mean±SD	Difference Mean±SD	p value
Nasal congestion	2.12±0.73	0.77±0.58	1.34±0.78	<0.001
Nasal blockage	2.15±0.89	0.52±0.61	1.63±0.9	
Trouble breathing through nose	1.83±1.04	0.21±0.41	1.61±1.08	
Trouble sleeping	1.48±1.05	0.08±0.26	1.40±1.05	
Unable to get enough air through nose during exercise	1.54±1.09	0.13±0.34	1.40±1.14	
Total score (out of 100)	45.58±21.38	8.46±8.37	37.11±21.22	

the “Rhinosinusitis Disability Index (RSDI)”, the “Sino-Nasal Outcome Test (SNOT-20)”, the “Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ)”, and the “Allergy Outcome Survey (AOS)”. However, none of these is specific to assess the nasal obstruction only. The CSS, the RSDI and the SNOT-20 were made to assess the chronic rhinosinusitis whereas the RQLQ and the AOS were mainly designed for allergic rhinoconjunctivitis. These questionnaires have some relationship in showing the nasal obstruction, but still fail to meet the necessity to have a specific instrument for nasal obstruction.¹⁸⁻²³ Therefore, the NOSE questionnaire was designed to assess the specific QoL associated with the nasal obstruction. It is a simple and fast questionnaire to answer. Its score varies between 0 and 100, with higher scores meaning greater nasal obstruction.⁶

In our study, females showed slightly higher mean NOSE scores both before and after septoplasty compared to males though not significant statistically. This might be a result of greater concern of health among females. However, both genders showed statistically significant improvement in mean NOSE scores after septoplasty with p values less than 0.001 for both groups. Majority of the patients (65.4%) in our study were below 31 years. This corresponds to the most productive years of an individual and therefore is quite understandably the period when one would want to have the best of health and quality of life. The mean NOSE scores before and after septoplasty were highest in >45 years age group though not significant statistically. However, all three age groups (≤30 years, 31 to 45 years and >45 years) showed statistically significant improvement in mean NOSE scores after septoplasty. These findings were comparable to several other studies which showed that age range or gender did not influence septoplasty outcomes.^{5,24,25}

Multiple physiological and psychological factors affect patients’ perception of nasal obstruction. The perception of nasal obstruction and outcomes of surgery also depend on operative technique, conditions of vascular and nerve supplies and expectations of patients from surgery.²⁴ In our study, all patients showed very significant improvement in nasal obstruction at 3 months. Similar results were obtained in other studies.^{5,13,24,26-28} Although our sample size was small, our results show that the effect of septoplasty in improving nasal obstruction is very powerful. This could be due to very precise patient selection for septoplasty in our institution where we choose to perform septoplasty only on grossly deviated nasal septum causing troublesome subjective nasal obstruction. Some investigators believe that, regardless of the magnitude of septal deviation, most patients benefit from its surgical correction because it eliminates a possible contributing factor to the pathogenesis of chronic rhinosinusitis.²⁹ This factor could also be taken into consideration for such high level of satisfaction achieved in our study. Nevertheless, inappropriate selection of surgery as a therapeutic option and inappropriate choice of surgical modality do seem to be major causes for dissatisfaction.^{30,31}

The coexistence of allergy or sinonasal disease with septal deviation is also statistically associated with higher rates of dissatisfaction after surgery.¹⁰ Because we excluded septoplasties done along with any other surgeries and included only those patients with nasal obstruction who failed a prior 4 week trial of medical management with nasal steroid, antihistaminic and/or oral decongestants, these possible sources of dissatisfaction were eliminated to a large extent in our study. This could also be another reason for high level of satisfaction observed in our study.

It is important to highlight that the prospective design, the use of a validated questionnaire, patient assessment based on results and the lack of follow up losses were the strengths of our study.

The use of a small non-randomized sample, single institutional set up and lack of long term follow up can be considered as limitations of our study. In future, larger multicentric studies with randomised probabilistic sampling process and long term follow up protocols could influence the result, its external validity and help us understand better about the outcomes of septoplasty in treating nasal obstruction. One of the weaknesses of our study is also the lack of a control group. However, there is no alternative treatment for a deviated nasal septum other than surgical correction, so clinical equipoise does not allow for randomization away from septoplasty to sham or placebo surgery or nonsurgical treatment.^{5,26} Of course, the inclusion criteria used in our study required that medical therapy had failed for each patient; therefore, all patients in the study had a trial of nonsurgical treatment before septoplasty.

In conclusion, nasal obstruction is one of the symptoms which is hard to evaluate. NOSE scale could be used for the evaluation of this symptom. NOSE scale is a valid, reliable and responsive instrument that is brief and easy to complete and has potential use for outcome studies in adults with nasal obstruction. This instrument showed that septoplasty, if done in properly selected patients, results in significant improvement in nasal obstruction and disease specific QoL with high patient satisfaction.

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