

A Questionnaire-Based Assessment of the Association between Subjective and Objectives Parameters of Septoplasty

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Abstract

Aims: The objective of this study was to assess the disease outcomes of patients undergoing septoplasty by means of a questionnaire using modified NOSE scale.

Methods: A prospective study was conducted at, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar in the department of ENT for a period of 1 year in 60 patients who underwent septoplasty. Preoperative and postoperative data were documented and analysed to get the results.

Results: Post-op subjective evaluation by evaluating mean modified nose obstruction symptom evaluation (NOSE) score also depicted a significant improvement ($p < 0.5$). Most common type of patients seen in our study was type II (36%) followed by type IV (27%) and type VII (12%). There was no patient which fell into type V of this classification.

Conclusions: There was improvement in both subjective and objective outcomes postoperatively. Study concluded that modified NOSE scale addresses wider range of symptomatology and is a good tool for subjective assessment of septoplasty.

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Introduction

Nasal blockage is one of the most common complaints that people have when they go to the otolaryngology OPD. Septal deviation is one of the most common reasons for a nose that won't drain. The only way to fix a deviated nasal septum is with surgery, which is called septoplasty. [1,2] How a patient feels about a blocked nose is complicated and depends on many mental and physical factors.

There are many things that can cause nasal obstruction, and there are also many ways

to measure it. Subjectively or objectively, you can judge how well nasal surgery worked. Subjective evaluations are done based on scores for symptoms like quality of life, which are measured with the NOSE scale and the visual analogue scale (VAS). [3,4]

Imaging studies like CT and MRI can be used as anatomic outcome measures to directly measure the volume and area of the nasal airway. Imaging is a static measurement, so the area and volume can

change depending on how stuffed up your nose is. This is a very big problem with imaging. [5-7] Still, there isn't a tool that everyone agrees on to objectively measure nasal obstruction. Patient-reported outcome measures (PROM) look at the patient's own thoughts and feelings. It also looks at the patient's own opinion of how well the treatment worked, without any interpretation from the doctor or anyone else. [8] It gives a number-based evaluation of the results, which would not be possible otherwise. Those used for nasal obstruction are specific to the disease because the results of nasal surgery may be too subtle to be used for global quality of life measures. [9]

Global quality of life and health status instruments play an important role in the assessment of health status. Most widely used validated PROM for evaluation currently is NOSE scale. [10] It includes set of 5 questionnaire based on a 4-point scale, with scores reported on scale of 0 to 100 by multiplying the raw score by 5. A severity classification of the NOSE scale was developed (mild: 5-25, moderate: 30-50, severe: 55-75, extreme: >80) which had almost 90% sensitivity and specificity in evaluation of patients with nasal airway obstruction. [11]

It has been proven to work for groups of patients, not for a single patient. So, it can be used to compare the effects of different treatments, like medical vs. surgical. It can be used to compare how healthy someone was before treatment and how healthy they are after treatment. It can also be used to see how different surgical techniques affect the outcome.

The objective of this study was to assess the disease outcomes of patients undergoing septoplasty by means of a questionnaire using modified NOSE scale.

Methods

A prospective study was conducted at Anugrah Narayan Magadh medical college and hospital, Bihar in the department of

ENT for a period of 1 year in 60 patients who underwent septoplasty. Analysis of symptoms of all these patients undergoing septoplasty was done preoperatively and postoperatively. NOSE scale assesses the presence of nasal congestion, nasal obstruction, and trouble breathing through the nose, trouble sleeping and inability to get enough air through nose during exercise or exertion. In our study modified NOSE scale was used for analysis with additional questions which included presence of snoring, poor sense of smell, feeling panicky that enough air is not entering the nose, irritation in throat, nocturnal cough, frequency of common cold, daytime sleepiness, blocked sensation in ear, general health condition, headache and epistaxis. A score of 0 to 4 was given for each symptom, 4 being the most severe.

Inclusion criteria

Patients with age at least 14 years, septal deviation causing chronic nasal obstruction and symptoms lasting at least 3 months were included in the study.

Exclusion criteria

Patients with age below 14 years, septoplasty performed with concurrent sinus surgery, sleep apnea surgery and rhinoplasty and nasal fracture, adenoid hypertrophy, history of chronic sinusitis, allergic rhinitis, prior nasal surgery and uncontrolled asthma were excluded from the study.

Statistical methods

Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. The association between pre-operative and post-operative outcomes was assessed by cross tabulation. $P < 0.05$ was considered statistically significant. IBM SPSS version 22 was used for statistical analysis.

Result

Table 1: Comparison between pre-op and post-op symptom by modified NOSE score

		Mean	SD	P value
Nasal obstruction	Pre	2.18	0.5	0.001 (S)
	Post	0.9	0.46	
Sense of smell	Pre	1.13	0.56	0.001 (S)
	Post	1.74	0.96	
Snoring	Pre	1.43	0.75	0.001 (S)
	Post	0.23	0.74	
Trouble sleeping	Pre	2.05	1.05	0.001 (S)
	Post	0.43	0.76	
Unable to get air	Pre	2.73	0.81	0.001 (S)
	Post	0.49	0.62	
Feeling panic	Pre	1.44	0.62	0.001 (S)
	Post	0.23	0.18	
Throat irritation	Pre	0.78	0.16	0.001 (S)
	Post	0.16	0.09	
Nocturnal cough	Pre	0.9	0.87	0.001 (S)
	Post	0.46	0.15	
Common cold	Pre	1.74	0.89	0.001 (S)
	Post	0.61	0.76	
Day time sleepiness	Pre	1.84	0.89	0.001 (S)
	Post	0.55	0.16	
Blocking sensation in ear	Pre	0.57	0.08	0.001 (S)
	Post	0.13	0.05	
General health	Pre	1.38	0.74	0.001 (S)
	Post	0.47	0.53	
Headache	Pre	1.53	0.88	0.001 (S)
	Post	0.43	0.43	
Bleeding from nose	Pre	0.37	0.18	0.001 (S)
	Post	0.05	0.1	

Similarly, the improvement in modified NOSE score was significant for all the symptoms post operatively ($p < 0.5$)

Objective outcome

Preoperative assessment of all the patients was done objectively with help of diagnostic nasal endoscopy and were classified in seven different types on basis of Mladina's classification of septal deviation. Most common type of patients seen in our study was type II (36%) followed by type IV (27%) and type VII (12%). There was no patient which fell into type V of this classification.

Discussion

This study was an attempt to evaluate the subjective and objective outcomes of septoplasty using modified NOSE scale and diagnostic nasal endoscopy respectively.

In our study maximum patient were observed in type II (36%) followed by type IV (27%) and type VII (12%). Hubballi et al in his study mentioned the most common type as type II (33%) followed by type V (45%). [12] In another study conducted by Sam et al, found type VII (29%) to be most common. In our study least common was type V with no patients falling into this type. [13]

Preoperative mean modified NOSE score were calculated for all patients and were calculated again postoperatively for all. Amongst all the symptoms as per modified NOSE scale used, almost all the patients had nasal obstruction of different severity as one of the symptoms. Similar results were observed in study conducted by Hubballi et al using NOSE scale. [11] Similar results were seen in study conducted by Konstantinidis et al. Mean scores of modified NOSE scale were compared and all showed a significant reduction in mean score ($p < 0.5$). In our study a significant improvement was seen in all the symptoms of the modified NOSE score. Percentage improvement in mean modified NOSE score for symptoms of throat irritation, bleeding from nose and blocking sensation in ear was less than that of others mainly because fewer patients reported them as a symptom preoperatively and those who did, reported them of mild severity on modified NOSE scale. Similar results of improvement in subjective outcome of septoplasty were reported from several previous studies. Gandomi et al published similar results and said that there was improvement in symptomatology following septoplasty. [14,15]

Fairley nasal symptom score is also used by Arunachalam et al. to say the same thing. [16] Eren et al. said that after septoplasty, the Visual Analogue Scale (VAS) and NOSE scores were much better. [17] In our study, we looked at the objective results by dividing the patients into four groups after the surgery. These were anatomical deviations that had been completely fixed, partially fixed, not fixed at all, or made worse by complications. There were only two people with type II, and all of them showed full improvement after surgery. In type II, 82% showed full correction and 18% showed partial correction. In type III, all of the patients had some improvement. In type IV, 13% showed full correction and 87% showed partial correction. Type VI showed that

100% of the mistakes were fixed. In type VII, both full correction and partial correction were worth 50%.

In type V, there was no case. Siegel et al., who looked at the success rate of septoplasty, found that it was between 43% and 85%. [18] Diagnostic nasal endoscopy has not been used in many studies to look at the objective results of septoplasty. [19]

Even though all types of patients in both the fully corrected and partially corrected groups got better, the fully corrected group got better faster than the partially corrected group. So, the results were consistent, and there was a clear link between how people felt about the surgery and how well it worked. In his study, Eren et al. also found a link between subjective and objective results. [17] Even though he used the NOSE scale, the visual analogue scale, and the Acousticrhinometry, Rhinomanometry and peak nasal inspiratory flow for objective evaluation. A limitation of our study was lack of control group but as there is no alternative management for deviated nasal septum other than the surgical option and a non-surgical control group was not possible.

Conclusion

In patients with septal deformity objective assessment with diagnostic nasal endoscopy showed significant improvement following septoplasty. A high patient satisfaction was also noted in symptomatology using modified nose scale.

References

1. Denholm SW, Sim DW, Sanderson RJ. Otolaryngological indicator operations: one year's experience. *JR Coll Surg Edinb.* 1993; 38:1-3.
2. Gliklich RE, Metson R. Effect of sinus surgery on quality of life. *Otolaryngol. Head Neck Surg.* 1997; 117:12-7.
3. Stewart MG, Witsell DL, Smith TL. Development and validation of the

- Nasal Obstruction Symptom Evaluation (NOSE) scale. *Otolaryngol Head Neck Surg.* 2004; 130:157-63.
4. Eccles R. Nasal airway resistance and nasal sensation of airflow. *Rhinol Suppl.* 1992; 14:86-90.
 5. Rhee JS, Weaver EM, Park SS. Clinical consensus statement: diagnosis and management of nasal valve compromise. *Otolaryngol Head Neck Surg.* 2010;143(1):48-59.
 6. Dastidar P, Numminen J, Heinonen T. Nasal airway volumetric measurement using segmented HRCT images and acoustic rhinometry. *Am J Rhinol.* 1999;13(2):97-103.
 7. Cakmak O, Coskun M, Celik H. Value of acoustic rhinometry for measuring nasal valve area. *Laryngoscope.* 2003;113(2):295-302.
 8. Lasch KE, Marquis P, Vigneux M. PRO development: rigorous quantitative research as the crucial foundation. *Qual Life Res.* 2010; 19(8):1087-96.
 9. Biggs TC, Fraser LR, Ward M. Patient reported outcome measures in septorhinoplasty surgery. *Ann R Coll Surg Engl.* 2015;97(1):63-5.
 10. Stewart MG, Witsell DL, Smith TL. Development and validation of the Nasal Obstruction Symptom Evaluation (NOSE) scale. *Otolaryngol Head Neck Surg.* 2004; 130:157-63.
 11. Lipan MJ, Most SP. Development of a severity classification system for subjective nasal obstruction. *JAMA Facial Plast Surg.* 2013;15(5):358-61.
 12. Hubballi R, Koujalagi S. Association of external nose deformity in individuals with nasal septal deviation. *Int J Otorhinolaryngol Head Neck Surg.* 2019;5(5):1372-8.
 13. Sam A, Deshmukh PT, Patil C, Jain S, Patil P. Nasal septal deviation and external nasal deformity: a correlative study of 100 cases. *Indian J Otolaryngol Head Neck Surg.* 2012; 64(4):312-8.
 14. Konstantinidis I, Triaridis S, Triaridis A, Karagiannidis K, Kontzoglou G. Long term results following nasal septal surgery. Focus on patients' satisfaction. *Auris Nasus Larynx.* 2005; 32(4):369-74.
 15. Gandomi B, Bayat A, Kazemei T. Outcomes of septoplasty in young adults: The Nasal Obstruction Septoplasty Effectiveness study. *Am J Otolaryngol.* 2010;31(3):189-92.
 16. Arunachalam PS, Kitcher E, Gray J, Wilson JA. Nasal septal surgery: evaluation of symptomatic and general health outcomes. *Clin Otolaryngol Allied Sci.* 2001;26(5):367-70.
 17. Eren SB, Tugrul S, Dogan R, Ozucer B, Ozturan O. Objective and subjective evaluation of operation success in patients with nasal septal deviation based on septum type. *Am J Rhinol Aller.* 2014;28(4):e158-62.
 18. Siegel NS, Gliklich RE, Taghizadeh F, Chang Y. Outcomes of septoplasty. *Otolaryngol Head Neck Surg.* 2000; 122 (2):228-32.
 19. Kafaji M. S. A. A.-., & Alsaadi Z. H. Pinworms Infection: Review. *Journal of Medical Research and Health Sciences,* 2022;5(8), 2182–2189.