

# Septoplasty - Does It Change the Quality of Life in Patients Having Nasal Obstruction?

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Priyanka Debbarma,<sup>1</sup> Sonali Jana,<sup>1</sup> Ruma Guha,<sup>1</sup> Kumar Shankar De,<sup>1</sup> Bivas Adhikary<sup>1</sup>

## ABSTRACT

### Introduction

Deviated nasal septum (DNS) is one of the most common causes of nasal obstruction. However, there are several other etiologies which cause difficulty in nasal breathing. The definitive treatment of symptomatic DNS is septoplasty. The efficacy of septoplasty remains controversial as there are no solid tools for clinical evaluation of patients for establishment of reliable statistical data. Our aim was to evaluate patients who have undergone septoplasty for symptomatic DNS, by following them up with the NOSE questionnaire for predicting the surgical efficacy of septoplasty.

### Materials and Methods

This was a prospective observational study, conducted over 1 year. 50 cases of either sex of 18-65 years, having symptomatic DNS not relieved by medical management, and corrected by isolated septoplasty were included. The primary outcome was measured by the NOSE questionnaire, applied before surgery, and 6<sup>th</sup> week and 12<sup>th</sup> week after the procedure from which the 12<sup>th</sup> week nasal score was taken into consideration.

### Results

The paired T test done among the variables showed a clear significance, proving the efficacy of the NOSE score in predicting the symptom reducing efficiency of septoplasty

### Conclusion

The NOSE score can be used as a regular quality scoring system in analysing the outcomes of septoplasty.

### Keywords

Deviated Nasal Septum; Septoplasty; Diagnostic Nasal Endoscopy; NOSE score

Deviated nasal septum (DNS) is one of the most common causes of nasal obstruction. However, there are several other etiologies which cause difficulty in nasal breathing.<sup>1</sup> Nasal obstruction is an immensely subjective sensation. Many patients are asymptomatic and live with it, until it hampers their daily life. DNS can have a significant deleterious effect on a patient's quality of life.<sup>2</sup> Nasal valve collapse often co-exists and may interfere with proper airflow.<sup>3</sup> The definitive treatment of DNS is septoplasty, and DNS is often associated with overgrowth of inferior turbinates, which regress on their own after septoplasty.<sup>4</sup> The efficacy of septoplasty for treatment of DNS remains controversial as there are no solid tools for clinical

evaluation of patients for establishment of reliable statistical data. As patient's perception of nasal airflow is of primary concern, the improvement in subjective score of patient's symptoms is definitely an important outcome parameter of management. There are many questionnaires available; some of them only contain items related to nasal symptoms whereas others include general quality of life. NOSE (Nasal Obstruction & Symptom Evaluation) scale was introduced by Stewart et al in

*1 - Department of ENT and Head Neck Surgery, Calcutta National Medical College and Hospital, West Bengal*

### **Corresponding author :**

Dr Kumar Shankar De

email: kumarshankarde@gmail.com

2004.<sup>5</sup> This is a disease specific quality of life scale for subjective assessment of nasal obstruction. It is in the form of a questionnaire containing five symptoms (nasal congestion, nasal obstruction, trouble breathing through nose, trouble sleeping and unable to get enough air through during exertion) in increasing severity. The NOSE scale has been validated as a Quality of Life (QOL) instrument for septoplasty and functional rhinoplasty. There are several studies on the QOL after septoplasty using the NOSE score.<sup>6, 7</sup>

The aim of our study is to evaluate patients who have undergone septoplasty for a symptomatic DNS, by following them up through with the NOSE questionnaire for predicting the surgical efficacy and QOL after septoplasty.

## Materials and Methods

This was a prospective observational study, conducted in the department of ENT and Head-Neck surgery of a tertiary care hospital, Kolkata, over a period of one year from February 2019 to January 2020. 50 cases of either sex in age group of 18-65 years, having symptomatic DNS that was not relieved by medical management (topical nasal decongestants and steroids, oral antihistamines and decongestants) and therefore corrected by isolated septoplasty operation were included in this study.

Cases having associated sinonasal diseases (acute and chronic rhinosinusitis, granulomatous conditions of nose, sinonasal polyp, atrophic rhinitis, sinonasal malignancy), uncontrolled asthma and diabetes mellitus or history of nasal trauma in the recent past were excluded from the study. A comprehensive history taking and thorough physical examination including anterior rhinoscopy as well as Diagnostic Nasal Endoscopy was performed in each and every case to exclude other sinonasal diseases. Examination was followed by radiological images (Computed Tomography Nose and Paranasal sinus) in all the cases. Patients were then asked to fill questionnaires relating to severity of their symptoms using NOSE scale. It asks patients to rate on a 0–4 scale. The total score is then multiplied by 5 for a maximum score of 100, with 0 being asymptomatic and 100 being the worst-case scenario. (0 - no problem, 1- very mild problem, 2 - moderate problem, 3 - fairly bad problem,

4 - severe problem.<25 suggestive of mild obstruction, 25-50 moderate obstruction, >50 - severe obstruction.)

Patients were prepared with nasal decongestion using 4% lignocaine with adrenaline 10 minutes prior to surgery. After infiltration with 2% lignocaine with adrenaline (1:200000) into the septum, a vertical hemitransfixion incision was made 2-3 mm posterior to the caudal end of septum on concave side along the entire height of the septum. Sub perichondrial and subperiosteal flaps were elevated from both sides of septum. Deviated part of both cartilage and bony septum were removed. Caudal and dorsal L struts having width of at least 10 mm were preserved. Elevated flaps were repositioned to the original site and haemostasis achieved. Nasal polyvinyl alcohol sponge packs were placed for 48 hours. Patients were given parenteral antibiotics, analgesics and antihistamines. They were discharged following pack removal after 48 hours.

All patients were reviewed after the 1<sup>st</sup> week, 3<sup>rd</sup> week, 6<sup>th</sup> week and 12<sup>th</sup> week post operatively for objective assessment by performing nasal endoscopy for adhesion or any other complication. The primary outcome measure was the disease-specific QOL score, measured by the NOSE questionnaire, applied before surgery and 6<sup>th</sup> week and 12<sup>th</sup> week after the procedure from which the 12<sup>th</sup> week nasal score was taken into consideration for the study.

The data obtained from the study subjects was entered in Microsoft Excel and further analysis was done by the drawn data from Excel and running it in IBM SPSS, PYTHON VERSION 25, USA. The data was tabulated and statistically analysed using paired 't' test. Final resultant variable taken into analysis was the total sum of the NOSE score before and after surgery, thereby comparing the statistical significance and surgical success rate in reducing symptoms. With a confidence interval of 95% (CI), alpha value <0.05 was taken as statistically significant in predicting the efficacy of septoplasty in reducing symptoms.

## Results

In our study of 50 patients aged between 18-65 years, 34 patients were male and 16 were female.

**Table I : Mean, Std deviation and Std error mean of pre-op and post-op value of all the five components of NOSE score.**

		MEAN	N	STD DEVIATION	STD ERROR OF MEAN
Pair 1	Preop nasal congestion score	1.08	50	.986	.140
	Postop nasal congestion score	.02	50	.141	.020
Pair 2	Preop nasal blockage score	1.56	50	.907	.128
	Postop nasal blockage score	.04	50	.198	.028
Pair 3	Preop nasal breathing score	1.48	50	.953	.135
	Post op nasal breathing score	.04	50	.198	.028
Pair 4	Preop nasal score of trouble sleeping	2.42	50	.971	.137
	Postop score of trouble sleeping	.10	50	.303	.043
Pair 5	Preop score of unable to get enough air through during exercise	2.56	50	.812	.115
	Post op score of unable to get enough air through during exertion	.46	50	.542	.077

**Table II : Correlation and p value of NOSE score variables both pre- and post-operatively**

		N	CORRELATION	P VALUE
Pair 1	Preop nasal congestion score & postop nasal congestion score	50	.427	.002
Pair 2	Preop nasal blockage score & postop nasal blockage score	50	.214	.136
Pair 3	Preop nasal breathing score & post op nasal breathing score	50	.437	.002
Pair 4	Pre op nasal score of trouble sleeping & postop score of trouble sleeping	50	.409	.003
Pair 5	Preop score of unable to get enough air through during exercise & post op score of unable to get enough air through during exertion	50	.561	.000

**Table III : Mean, Std deviation and Std error mean of total pre-op and post-op NOSE score**

		MEAN	N	STD. DEVIATION	STD. ERROR MEAN
Pair 1	Total preop score	45.30	50	15.728	2.224
	Total post op score	3.30	50	3.587	.507

**Table IV : Correlation and significance of total preop and postop NOSE score**

		N	CORRELATION	P VALUE
Pair 1	Total pre op score & Total post op score	50	.769	.000

Table I shows the mean, std. deviation and std. error calculated for all 5 components of the NOSE score, for both pre-operative as well as the post-operative period. The standard deviation for the study components varied from (0.14-0.98) from the mean and the standard error of the mean varied between (0.02-0.14).

Table II shows the sample size and correlation with associated significance by paired T test. Except pair 2, all other pairs show an alpha value of <0.05 with 95% CI. The alpha value for pair 2 (i.e., pre and post op nasal blockage score) is 0.136 which is higher than our target value of 0.05. The remaining parameters are lower than our target alpha thereby showing significance.

The pre-op and post-op total NOSE score sum SD is +/-13.5 and +/-3.5 from the mean of 45.3 and 3.3, with the correlation of 0.769 and significance <0.05.

The paired T test done among the variables showed clear significance, proving the efficacy of the NOSE score in predicting the symptom reducing efficiency of Septoplasty.

## Discussion

We conducted a prospective study in 50 patients with septal deviation. The primary goal of our study was to assess the quality of life after septoplasty. There are several studies showing the effectiveness of septoplasty

by comparing preoperative and postoperative score of patients symptom improvement in a patient of DNS. QOL can be assessed with the Sino-Nasal Outcome-Test-20 (SNOT 20) questionnaire which is a validated disease specific Quality of life questionnaire for rhino-sinusitis.<sup>8,9</sup> Since we excluded acute and chronic rhino-sinusitis from our study, we are not going in details about SNOT-20 score. NOSE questionnaire was first developed by Stewart MG et al.<sup>10</sup> followed by another study by them in the same year to see outcomes after nasal septoplasty: results from the Nasal Obstruction Septoplasty Effectiveness (NOSE) study.<sup>11</sup> The NOSE score has become a valuable measure of outcome of nasal obstruction treatment. It is a brief, simple, and easily administered quality-of-life instrument specific to nasal obstruction. We used NOSE questionnaire in our study for predicting the surgical efficacy and quality of life after septoplasty.

Patients were asked to fill questionnaires relating to severity of their symptoms using Nasal Obstruction Symptom Evaluation (NOSE) scale. Follow up of the patient was done in post operative weeks. A predicted nose score was achieved at 12th week postoperatively by using NOSE score to calculate the outcome and we found an improvement in both symptoms and score. Stewart et al<sup>11</sup> and Gandomi et al<sup>12</sup> have shown that nasal obstruction improves significantly within the first three

postoperative months and this symptom stabilizes by six months after surgery. In our study improvement in symptom was significant in 12th postoperative week. So, our study was consistent with the above mentioned study. Jessen et al<sup>13</sup> concluded that an initial improvement of nasal obstruction in the first months to years after surgery becomes progressively undervalued, especially when other causes of obstruction are present, such as chronic rhinitis and sinusitis. We did not follow up patients for a long term as mentioned in many studies. There are some retrospective studies that have reported that symptoms either remained or worsened 3 to 6 years after septoplasty.<sup>14-17</sup> During our 3 months postoperative follow up period we did not find any recurrence of the disease or any symptoms.

The patient's perception of the nasal obstruction is more complex and may be affected by a variety of physiologic and psychological factors. The operative technique, an inappropriate indication for nasal septoplasty,<sup>18</sup> the condition of the vascular and nerve supply inside the nasal cavity and the expectations of the patients regarding the surgery may affect the perception of nasal obstruction and the outcome of the surgery.<sup>19</sup>

Dinesh Kumar R et al<sup>4</sup> in their study showed highly significant positive result for post operative improvement for septoplasty with partial inferior turbinectomy group. According to NOSE score, patients undergoing partial inferior turbinectomy with septoplasty have more symptomatic relief compared to those undergoing septoplasty alone. On the other hand, Velasco LC et al<sup>20</sup> in their prospective study, focused on the evaluation of the main nasal symptoms, including nasal obstruction. They found that septoplasty, with or without turbinectomy, resulted in improvement of all symptoms regressed more markedly within the first seven postoperative days; then patients improved more gradually until the 60th postoperative day with regards to most symptoms. The later study is corroborative with ours where we performed isolated septoplasty operation in each patient and found an improvement in their symptom score.

Small size sample, short duration of study and short duration of follow up were the limitations of our study. Since the sample size was smaller the power of the study

might vary and the same applies for significance of the study.

## Conclusion

The definitive treatment of DNS is the universally accepted surgical correction or septoplasty. However, the benefits of septoplasty, as perceived by the patient, widely vary over different grades of satisfaction, ranging from complete alleviation of symptoms to a total failure. NOSE score is effective in subjective evaluation of patients in the early postoperative period. Surgical correction of obvious anatomic deviation can significantly improve symptoms. There are various factors based on which patient satisfaction rate will vary. NOSE score can be used as a subjective tool for assessment of patients with nasal symptoms preoperatively and postoperatively in addition to existing methods of evaluation.

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