

A COMPARISON STUDY OF SYMPTOMATIC IMPROVEMENT FOLLOWING REVISION SEPTOPLASTY VERSUS PRIMARY SEPTOPLASTY USING NOSE SCALE

Otorhinolaryngology

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ABSTRACT

Introduction: Deviated Nasal Septum is one of the commonest causes of nasal obstruction in patients coming to otorhinolaryngology department. Septoplasty is commonly performed surgical procedure for relieving nasal symptoms in patients with deviated nasal septum. Studies shows, in patient with recurrence of symptoms post primary septoplasty, revision septoplasty would be required to ensure relief of symptoms. There are several methods to quantify the degree and severity of the nasal obstruction. In this study, the popular NOSE scale (Nasal Obstruction Symptom Evaluation) has been used. This questionnaire consists of 5 symptoms - nasal obstruction, nasal congestion, trouble in sleeping, unable to get enough air through the nose during exercise or exertion, and trouble breathing through the nose. **Objectives:** To compare the symptomatic improvement in patients undergoing revision septoplasty post primary septoplasty and to assess the preoperative and postoperative NOSE SCORE in both groups. **Methodology:** During study 35 patients with nasal obstruction due to Deviated Nasal Septum post primary septoplasty were selected. A detailed history, clinical examination, Diagnostic Nasal Endoscopy (DNE) and NOSE Score were calculated for all patients. The patients were evaluated preoperatively and post operatively. The patients had follow-up at 1 week and 2 weeks and the NOSE score were again calculated at 2 weeks, 1 month and 3 months postoperatively. **Results:** In this study, the mean age of patients was 26 ± 5 for Group A and 26.6 ± 7 for group B. Majority presented with complaints of nasal obstruction followed by nasal congestion and trouble sleeping. While both surgeries improved symptoms, it was found that patients in group B had significantly more improvement in post operative NOSE scores than group A with $p < 0.01$ at 2 weeks, 1 month and 3 months postoperatively. **Conclusion:** Revision septoplasty is an effective surgical procedure for persistent deviated septum after septoplasty. It provides significant symptomatic relief for the patient. Nasal obstruction symptom evaluation (NOSE) questionnaire effectively assessed the improvement in quality of life among the symptomatic patients.

KEYWORDS

Deviated nasal septum; NOSE scale; Septoplasty; Revision septoplasty.

INTRODUCTION

Deviated Nasal Septum is one of the commonest causes of nasal obstruction in patients coming to otorhinolaryngology department. Septoplasty is commonly performed surgical procedure for relieving nasal symptoms in patients with deviated nasal septum.

The main functions of the nose include olfaction, heat exchange, humidification and defence. All these functions require good interaction between the inspired air and the mucous membranes or the sensory cells of the olfactory system.

This is achieved by complicated aerodynamics that depends on the geometry of the internal nose. The septum helps to preserve this geometry. The septum also supports the dorsum, columella and the tip of the nose and as such it contributes to cosmesis.

The nose which is the most prominent part of the face is very much vulnerable starting from life in utero, in which the septum is mainly involved. Therefore, in adulthood a straight septum is more of an exception than the rule.¹

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There are several methods to quantify the degree and severity of the nasal obstruction. In this study, the popular NOSE scale (Nasal Obstruction Symptom Evaluation) has been used. This questionnaire consists of 5 symptoms - nasal obstruction, nasal congestion, trouble in sleeping, unable to get enough air through the nose during exercise or exertion, and trouble breathing through the nose.

MATERIALS AND METHOD

The data was collected from 35 patients with nasal obstruction, who are evaluated to have Deviated Nasal Septum post primary septoplasty from the inpatient ENT department at the Chigateri District Hospital and Bapuji Hospital, J.J.M. Medical College in Davangere, Karnataka.

- **Sample Size:** 35 cases.
 - o Group A: consist of patients who had undergone Septoplasty.
 - o Group B: consist of the same patient post Revision Septoplasty
- **Sampling Method:** Patients were selected based on random sampling method.

Postoperatively merocel nasal pack was removed after 48 hours.

Postoperative treatment included antibiotics for 7 days, topical decongestants and nasal douching for 10 days.

The patients had a follow up at 1 week and 2 weeks and the NOSE score was calculated again at 2 weeks, 1 month and 3 months postoperatively. The data was subjected to statistical analysis and results were obtained.

Statistical Analysis

- Categorical data will be represented in the form of frequency and percentage Association between variables will be assessed with Chi Square Test and Fishers Exact test if the cell values were small.
- Quantitative data will be represented as Mean & Sd. Comparison between groups will be done with Unpaired t test.
- A P value of < 0.05 will be considered statistically significant.
- Data will be analysed with IBM SPSS Version 28 for windows.

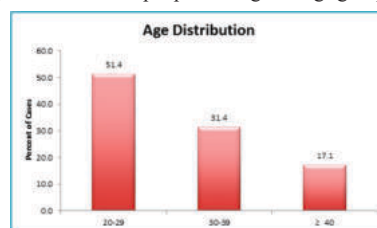
RESULTS

In the present study, 35 patients who underwent septoplasty with persistent nasal obstruction was taken as Group A and Group B consisted of same patient after revision septoplasty. NOSE score was used to evaluate the efficacy of the treatment.

Table 1: Age Distribution

Age	No of cases	Percent
20-29	18	51.4
30-39	11	31.4
≥ 40	6	17.1
Total	35	100.0

In this study most number of people belonged to age group of 20 to 29.

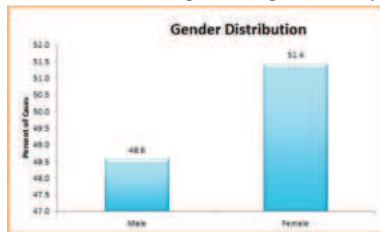


Graph 1: Age Distribution

Table 2: Gender Distribution

Gender	No of cases	Percent
Male	17	48.6
Female	18	51.4
Total	35	100.0

Gender Distribution was almost equal in the present study.

**Graph 2: Gender Distribution****Table 3: Intergroup Comparison Preoperative NOSE Score and Postoperative 2nd Week NOSE Score**

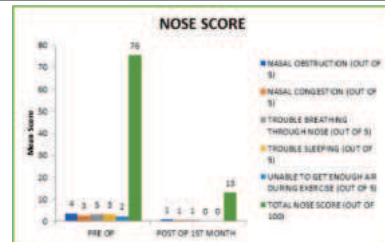
NOSE Score	Pre. Op Nose Score		Post Op 2nd Week Nose Score		Mean difference	Paired t test	
	Mean	Sd	Mean	Sd		t Value	P Value
Nasal Obstruction (Out Of 5)	3.60	0.60	2.09	0.66	1.51	10.502	P<0.001
Nasal Congestion (Out Of 5)	2.66	0.94	1.66	0.64	1.00	5.916	P<0.001
Trouble Breathing Through Nose (Out Of 5)	3.26	0.66	1.71	0.57	1.54	11.702	P<0.001
Trouble Sleeping (Out Of 5)	3.26	0.66	1.49	0.51	1.77	11.125	P<0.001
Unable To Get Enough Air During Exercise (Out Of 5)	2.34	0.68	1.17	0.62	1.17	8.087	P<0.001
Total Nose Score (Out Of 100)	75.57	7.35	40.57	7.55	35.00	22.044	P<0.001

Overall, a significant improvement in the total NOSE score ($P<0.001$) was noted at end of 2nd postoperative week.

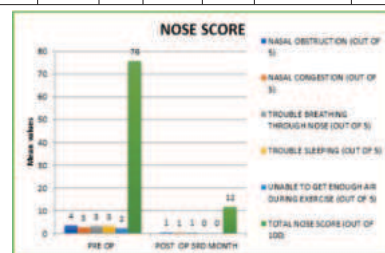
**Graph 3: Intergroup Comparison Preoperative NOSE Score and Postoperative 2nd Week NOSE Score****Table 4: Intergroup Comparison Preoperative NOSE Score and Postoperative 1st Month NOSE Score.**

NOSE Score	Pre. Op Nose Score		Post Op 1st Month Nose Score		Mean difference	Paired t test	
	Mean	Sd	Mean	Sd		t Value	P Value
Nasal Obstruction (Out Of 5)	3.60	0.60	0.91	0.74	2.69	15.540	P<0.001
Nasal Congestion (Out Of 5)	2.66	0.94	0.54	0.56	2.11	12.234	P<0.001
Trouble Breathing Through Nose (Out Of 5)	3.26	0.66	0.60	0.55	2.66	18.755	P<0.001

Trouble Sleeping (Out Of 5)	3.26	0.66	0.34	0.54	2.91	21.081	P<0.001
Unable To Get Enough Air During Exercise (Out Of 5)	2.34	0.68	0.23	0.49	2.11	15.714	P<0.001
Total Nose Score (Out Of 100)	75.57	7.35	13.14	7.48	62.43	48.538	P<0.001

**Graph 4: Intergroup Comparison Preoperative NOSE Score and Postoperative 1 Month NOSE Score****Table 5: Intergroup Comparison Preoperative NOSE Score and Postoperative 3rd Month NOSE Score**

NOSE Score	Pre. Op Nose Score		Post Op 3rd Month Nose Score		Mean difference	Paired t test	
	Mean	Sd	Mean	Sd		t Value	P Value
Nasal Obstruction (Out Of 5)	3.60	0.60	0.60	0.55	3.00	23.141	P<0.001
Nasal Congestion (Out Of 5)	2.66	0.94	0.51	0.66	2.14	11.108	P<0.001
Trouble Breathing Through Nose (Out Of 5)	3.26	0.66	0.60	0.65	2.66	16.767	P<0.001
Trouble Sleeping (Out Of 5)	3.26	0.66	0.31	0.53	2.94	20.772	P<0.001
Unable To Get Enough Air During Exercise (Out Of 5)	2.34	0.68	0.29	0.46	2.06	15.169	P<0.001
Total Nose Score (Out Of 100)	75.57	7.35	11.57	5.91	64.00	41.068	P<0.001

**Graph 5: Intergroup Comparison Preoperative NOSE Score and Postoperative 3rd Month NOSE Score****Table 6: Intergroup Comparison Preoperative and Postoperative NOSE Score**

NOSE Score	MEAN NOSE SCORE			
	PRE. OP	Post OP 2nd Wk	Post OP 1 Month	Post OP 3 Months
Nasal Obstruction (Out Of 5)	3.60	2.09	0.91	0.60
Nasal Congestion (Out Of 5)	2.66	1.66	0.54	0.51
Trouble Breathing Through Nose (Out Of 5)	3.26	1.71	0.60	0.60
Trouble Sleeping (Out Of 5)	3.26	1.49	0.34	0.31

Unable To Get Enough Air During Exercise (Out Of 5)	2.34	1.17	0.23	0.29
Total Nose Score (Out Of 100)	75.57	40.57	13.14	11.57



Graph 6: Intergroup Comparison Preoperative and Postoperative NOSE Score

Inference

- Nasal Obstruction improved significantly from a mean of 3.60 (Pre-op) to 0.60 at 3 months post-op.
- Nasal Congestion also improved from 2.66 (Pre-op) to 0.51 at 3 months.
- Trouble Breathing Through the Nose decreased from 3.26 (Pre-op) to 0.60 at 3 months.
- Trouble Sleeping improved from 3.26 (Pre-op) to 0.31 at 3 months.
- Unable to Get Enough Air During Exercise showed improvement from 2.34 (Pre-op) to 0.29 at 3 months.

Overall significant improvement in symptoms were noted at end of 2 week, 1st month and 3 months.

Finally, the Total NOSE Score also shows a major reduction from 75.57 (Pre-op) to 11.57 at 3 months with p value <0.001 which is highly statistically significant.

DISCUSSION

The findings of this study highlight the effectiveness of revision septoplasty in addressing persistent nasal obstruction following primary septoplasty. Using the NOSE (Nasal Obstruction Symptom Evaluation) scale, the study assessed symptomatic improvement over a period of three months postoperatively. The results demonstrated a significant reduction in nasal obstruction symptoms in the revision septoplasty group.

The NOSE score analysis revealed substantial symptomatic relief in the revision septoplasty group. Nasal obstruction, nasal congestion, trouble breathing through the nose, trouble sleeping, and difficulty getting enough air during exertion all showed marked improvement postoperatively, with statistically significant reductions in NOSE scores at 2 weeks, 1 month, and 3 months ($p < 0.001$).

The findings align with prior studies on revision septoplasty outcomes.

Lipani MJ et al.² developed a classification system for nasal obstruction using the validated NOSE (Nasal Obstruction Symptom Evaluation) questionnaire, which was retrospectively studied between July 2011 and May 2012. The study, conducted at a university-based tertiary medical center, included data from 345 patients. A NOSE score of 30 was found to be the optimal threshold for distinguishing between patients with and without nasal obstruction. This threshold was used to define different severity levels, categorizing patients into mild (5-25), moderate (30-50), severe (55-75), and extreme (80-100) nasal obstruction based on their responses. The study concluded that the NOSE scale is a crucial tool for assessing symptoms in patients with nasal obstruction, and the proposed classification system enhances patient care by providing clarity regarding symptom severity and aiding in treatment planning. Furthermore, using this classification in future outcome research could help physicians gain a better understanding of patient populations and the effects of treatment on different severity levels.

Siller MJ et al.³ focused on various surgical techniques for revision septoplasty, emphasizing the importance of accurate and comprehensive diagnosis to ensure effective nasal structural and functional correction.

A study by Gillman et al.⁴ demonstrated that patients who underwent

revision septoplasty experienced significant improvement in nasal obstruction symptoms, supporting the necessity of secondary surgery in cases where primary septoplasty failed to provide adequate relief. Similarly, Jeong JI et al.⁵ found that while primary septoplasty improved nasal airflow, revision septoplasty was necessary to address persistent or recurrent symptoms, particularly in cases with residual dorsal and posterior deformities.

Additionally, Derin et al.⁶ emphasized that persistent nasal obstruction post-septoplasty can be attributed to residual deviations, scarring, or incomplete correction during the primary procedure, reinforcing the need for a meticulous surgical approach during revision surgeries.

The study findings have significant clinical implications. They underscore the importance of careful preoperative evaluation and patient selection for revision septoplasty. Diagnostic nasal endoscopy and computed tomography (CT) scans can help identify structural abnormalities that were either unaddressed or developed postoperative.

Jeong JI et al.⁵ explored the temporal differences in nasal obstruction improvement between primary and revision septoplasty. Their subjective and objective evaluations indicated that dorsal and posterior deformities remained unchanged, despite previous surgeries. Daniel M. et al.⁷ in his study discusses failure patterns in primary septoplasty and surgical strategies to improve outcomes in revision cases.

Becker SS et al.⁸ highlighted the importance of assessing nasal valve pathologies prior to revision surgeries to ensure better results and alleviate symptoms of nasal obstruction.

Chambers KJ et al.⁹ evaluated nasal obstruction improvement in patients who underwent nasal valve correction after failed septoplasty. They observed that addressing nasal valve dysfunction prior to septoplasty resulted in significant improvement in nasal obstruction symptoms.

Edward N et al.¹⁰ conducted a study on 35 patients who underwent revision septal surgery, suggesting that revision surgery is a more conservative approach with fewer complications.

The NOSE score has also been utilized to assess outcomes in nasal valve surgery. A study by Rhee S et al., in 2005, involving 20 patients who underwent nasal obstruction surgery, demonstrated a statistically significant improvement in the mean NOSE score over a six-month period following surgery.¹¹

In the present study, NOSE scale was used to evaluate the efficacy of difference in symptoms pre and postoperatively, supported by a study by Kahveci OK et al.,¹² stating that NOSE scale is an effective tool for assessing septal surgery outcomes. Neither acoustic rhinometry (AR) nor rhinomanometry were effective in determining and evaluating the need for surgery for nasal blockage.

CONCLUSION

The study concludes that revision septoplasty is an effective procedure for patients with persistent nasal obstruction following a primary septoplasty. The NOSE scale proved to be a valuable tool for evaluating postoperative outcomes, showing a significant reduction in nasal obstruction and associated symptoms over time. The findings suggest that revision septoplasty can provide substantial symptomatic relief and improve patient's quality of life.

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