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A Comparative Study of Septoplasty with and Without Inferior Turbinate Reduction in 50 Patients Using NOSE Score

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ABSTRACT

Background: Nasal obstruction is one of the most common presenting complaints in otolaryngology, with a deviated nasal septum (DNS) being the leading structural cause. Although septoplasty remains the standard surgical treatment, nasal obstruction is frequently multifactorial, and inferior turbinate hypertrophy often contributes significantly to persistent airflow limitation. Failure to address turbinate hypertrophy at the time of septoplasty may result in suboptimal postoperative outcomes and residual symptoms. The Nasal Obstruction Symptom Evaluation (NOSE) score is a validated patient-reported outcome measure for assessing the severity of nasal obstruction and treatment efficacy. This study compared the clinical outcomes of septoplasty alone with septoplasty combined with inferior turbinate reduction.

Methods: A prospective comparative observational study was conducted among 50 patients aged 18–55 years with symptomatic DNS. Patients were allocated into two groups: Group A (n = 25) underwent septoplasty alone, while Group B (n = 25) underwent septoplasty with inferior turbinate reduction by outfracture and submucosal resection. Patients with previous nasal surgery, nasal polyps, allergic rhinitis, chronic rhinosinusitis, or other conditions affecting nasal airflow were excluded. NOSE scores were recorded preoperatively and at 15 days, 1 month, and 3 months postoperatively. Statistical analysis was performed using Student's *t*-test, with a *p*-value <0.05 considered statistically significant.

Results: Baseline demographic characteristics and preoperative NOSE scores were comparable between the groups. Both surgical approaches resulted in significant postoperative improvement; however, patients undergoing combined septoplasty and inferior turbinate reduction demonstrated significantly greater reductions in NOSE scores at all follow-up intervals ($p < 0.05$). At 3 months, the combined procedure achieved superior symptomatic relief with lower mean NOSE scores. Persistent nasal obstruction and postoperative synechiae were more frequent following septoplasty alone, whereas the addition of turbinate reduction improved functional outcomes without increasing postoperative complications.

Conclusion: Septoplasty combined with inferior turbinate reduction provides significantly greater improvement in nasal obstruction and patient-reported quality of life than septoplasty alone. Routine assessment and appropriate management of inferior turbinate hypertrophy should be considered during septoplasty to optimize surgical outcomes. Further large-scale studies with longer follow-up are warranted to validate these findings.

Keywords*: Deviated Nasal Septum, Septoplasty, Inferior Turbinate Reduction, Nasal Obstruction, NOSE Score, Turbinate Hypertrophy.*

INTRODUCTION

Nasal obstruction is one of the most common presenting complaints in otolaryngology practice and significantly affects quality of life, sleep, and overall well-being. Among the structural causes, deviated nasal septum (DNS) is the most frequently encountered abnormality leading to compromised nasal airflow. Septoplasty remains the standard surgical procedure for correcting septal deviation and improving nasal patency.[1]

However, nasal obstruction is often multifactorial. Inferior turbinate hypertrophy frequently coexists with DNS and plays a crucial role in increasing nasal airway resistance. In many patients, failure to address turbinate hypertrophy during septoplasty may result in persistent postoperative symptoms, thereby reducing patient satisfaction and surgical success rates.[2]

Inferior turbinate reduction techniques, such as outfracture and submucosal resection, have been widely used to improve nasal airflow by reducing turbinate bulk while preserving mucosal function. Several studies have suggested that combining septoplasty with inferior turbinate reduction yields better functional outcomes compared to septoplasty alone. Nevertheless, the necessity of routinely performing turbinate reduction remains a subject of ongoing debate.[3]

The assessment of surgical outcomes in nasal obstruction has evolved from purely objective measures to include patient-reported outcome measures. The Nasal Obstruction Symptom Evaluation (NOSE) score is a validated, disease-specific instrument that provides a reliable assessment of subjective improvement following nasal surgery.[4]

In this context, the present study aims to compare the outcomes of septoplasty alone versus septoplasty combined with inferior turbinate reduction using the NOSE score, thereby evaluating whether the addition of turbinate surgery provides significant clinical benefit.

METHODOLOGY

This prospective comparative observational study was conducted in the Department of Otorhinolaryngology at PIMS over a period of six months. A total of 50 patients aged between 18 and 55 years presenting with symptomatic nasal obstruction due to deviated nasal septum (DNS) were included in the study after obtaining informed consent. Patients with a history of previous nasal surgery, nasal polyps, allergic rhinitis, sinusitis, septal perforation, or those who were immunocompromised were excluded from the study.

The selected patients were divided into two equal groups of 25 each. Group A patients underwent septoplasty alone, while Group B patients underwent septoplasty combined with inferior turbinate reduction using outfracture and submucosal resection techniques. All procedures were performed under standard operative protocols.
The primary outcome measure was the Nasal Obstruction Symptom Evaluation (NOSE) score, a validated subjective assessment tool for nasal obstruction. NOSE scores were recorded preoperatively and postoperatively at 15 days, 1 month, and 3 months follow-up.

The collected data were analyzed using Statistical Package for the Social Sciences (SPSS) software. The mean NOSE scores between the two groups were compared using Student's t-test, and a p-value of less than 0.05 was considered statistically significant.

Each of the 5 symptoms is rated on a 5-point Likert scale, ranging from 0 (not a problem) to 4 (severe problem).

- Nasal congestion or stuffiness
- Nasal blockage or obstruction
- Trouble breathing through the nose
- Trouble sleeping
- Unable to get enough air during exercise/exertion

The points are added together and multiplied by 5 to create a final score between 0 and 100.

Interpretation

- 0 - 25: Mild obstruction
- 30 - 50: Moderate obstruction
- 55 - 75: Severe obstruction
- 80 - 100: Extreme obstruction

RESULT

Variable	Group A Septoplasty Alone (n = 25)	Group B Septoplasty + Inferior Turbinate Reduction (n = 25)	p-value

Age (years), Mean ± SD	30.84 ± 8.27	31.68 ± 7.95	0.72
Gender			0.76
• Male, n (%)	16 (64.0)	15 (60.0)	
• Female, n (%)	9 (36.0)	10 (40.0)	
Side of Septal Deviation			0.81
• Right	12 (48.0)	11 (44.0)	
• Left	13 (52.0)	14 (56.0)	
Type of Septal Deviation			0.69
• C-shaped	13 (52.0)	12 (48.0)	
• S-shaped	7 (28.0)	8 (32.0)	
• Spur/High deviation	5 (20.0)	5 (20.0)	
Inferior Turbinate Hypertrophy Grade*			0.84
• Grade I	6 (24.0)	5 (20.0)	
• Grade II	13 (52.0)	14 (56.0)	
• Grade III	6 (24.0)	6 (24.0)	
Duration of Symptoms (months), Mean ± SD	18.3 ± 7.6	19.1 ± 8.1	0.73
Preoperative NOSE Score, Mean ± SD	73.8 ± 8.4	74.6 ± 7.9	0.74

Time point	**Group A (Mean Nose +/- SD)**	**Group B (Mean Nose +/- SD)**	**P-VALUE**
Pre-op	72.4 +/- 8.3	73.1 +/- 7.9	0.72
15 days	48.2 +/- 6.4	38.5 +/- 5.7	<0.01**
1 month	39.3 +/- 6.0	24.7 +/- 4.9	< 0.01**
3 months	35.6 +/- 5.5	18.3 +/- 3.8	<0.001 **

A total of 50 patients were included in the study, with 25 patients in each group. Both groups were comparable in terms of age distribution and baseline characteristics. All patients completed the follow-up period of 3 months. Table 1 shows the baseline demographic and clinical characteristics of the study participants. There were no statistically significant differences between the two groups with respect to age, gender distribution, side or type of septal deviation, inferior turbinate hypertrophy grade, duration of symptoms, or preoperative NOSE scores ($p > 0.05$). This indicates that both groups were comparable at baseline, allowing valid comparison of postoperative outcomes.

The preoperative NOSE scores were comparable between Group A (septoplasty alone) and Group B (septoplasty with inferior turbinate reduction), with no statistically significant difference ($p > 0.05$), indicating similar baseline severity of nasal obstruction.

Postoperatively, both groups demonstrated significant improvement in NOSE scores at 15 days, 1 month, and 3 months follow-up compared to preoperative values. However, the improvement was significantly greater in Group B at all postoperative intervals. The mean NOSE score reduction was more pronounced in patients who underwent combined septoplasty with inferior turbinate reduction, and the difference between the two groups was statistically significant ($p < 0.05$).

Additionally, patients in Group A showed a higher incidence of persistent nasal obstruction and postoperative synechiae compared to Group B. In contrast, Group B patients experienced better symptomatic relief and improved nasal airflow without a significant increase in complications.

Overall, the results indicate that combining inferior turbinate reduction with septoplasty provides superior functional outcomes compared to septoplasty alone.

DISCUSSION

Nasal obstruction due to deviated nasal septum (DNS) is frequently associated with inferior turbinate hypertrophy, both of which contribute significantly to increased nasal airway resistance. While septoplasty is the standard surgical treatment for

DNS, the role of concurrent inferior turbinate reduction remains a topic of debate. The present study was conducted to evaluate whether combining inferior turbinate reduction with septoplasty offers superior symptomatic relief compared to septoplasty alone.[5]

In this study, both groups showed significant postoperative improvement in NOSE scores, indicating that septoplasty itself is effective in relieving nasal obstruction. However, patients who underwent septoplasty with inferior turbinate reduction (Group B) demonstrated significantly greater improvement at all follow-up intervals (15 days, 1 month, and 3 months), suggesting an additive benefit of turbinate surgery.[6]

The improved outcomes in the combined surgery group can be attributed to better correction of nasal airflow dynamics. Inferior turbinate hypertrophy contributes to persistent obstruction even after septal correction, and failure to address it may lead to suboptimal surgical outcomes. By reducing turbinate bulk through outfracture and submucosal resection, airway patency is further enhanced while preserving mucosal function.[7]

Our findings are consistent with previous studies. Liu et al., 2020 reported that septoplasty alone may not adequately relieve symptoms in patients with associated turbinate hypertrophy.[8] Similarly, Hakami et al., 2023[9] demonstrated superior outcomes in patients undergoing combined septoplasty and turbinectomy compared to septoplasty alone. These studies support the concept that nasal obstruction is multifactorial and requires a comprehensive surgical approach.

Another important observation in this study was the higher incidence of persistent nasal obstruction and postoperative synechiae in the septoplasty-only group. This may be due to ongoing mucosal contact and inadequate airway space when turbinate hypertrophy is not addressed. In contrast, the combined procedure group showed better postoperative healing and fewer complications, indicating that inferior turbinate reduction is a safe adjunct to septoplasty when performed appropriately.[10]

Although the combined procedure may involve slightly longer operative time and additional surgical manipulation, no significant increase in complications was observed in this study. This highlights the safety and feasibility of routinely incorporating inferior turbinate reduction in selected patients.[11]

CONCLUSION

Septoplasty combined with inferior turbinate reduction is more effective than septoplasty alone in relieving nasal obstruction. It leads to:

- Greater reduction in NOSE scores
- Faster symptomatic relief
- Improved quality of life

Routine evaluation and management of inferior turbinate hypertrophy should be considered during septoplasty planning. However, the study has certain limitations, including a relatively small sample size and short follow-up duration of 3 months. Long-term outcomes and objective measures such as rhinomanometry could further strengthen the findings.

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