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Comparative Study of Improvement in Nasal Symptoms Following Septal Correction with Partial Inferior Turbinectomy vs Septal Correction Alone

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Abstract

Nasal septal deviation is a common anatomical abnormality that can lead to nasal airway obstruction and other nasal symptoms. While septal correction is a well-established treatment, the effectiveness of this approach compared to septal correction combined with partial inferior turbinectomy is not well understood. This study aims to compare the improvement in nasal symptoms following these two surgical approaches.

Objectives:

This prospective comparative study aims to assess the symptomatic relief of nasal complaints in patients who underwent septal correction with partial inferior turbinectomy versus those who had septal correction alone.

Methods:

Sixty patients with septal deviation and contralateral inferior turbinate hypertrophy were enrolled in the study. Participants completed questionnaires using the Nasal Obstruction Symptom Evaluation scale to assess the severity of their symptoms. The patients were then randomly assigned to two groups. Individuals in Group A underwent septal correction combined with partial inferior turbinectomy, while those in Group B received septal correction alone. Post-operatively, the patients' symptoms were re-evaluated using the NOSE scale at 15, 30, and 60-day intervals. The data was thoroughly analyzed using tables, graphs, percentages, and statistical tests such as paired t-tests and ANOVA to determine the significance of the findings.

Results:

The findings of the study indicated that patients who underwent septal correction combined with partial inferior turbinectomy experienced more substantial improvement in their symptoms compared to those who received septal correction alone.

Conclusions: Septal correction with PIT should be a standard protocol in patients with DNS with inferior turbinate hypertrophy.

Keywords: Septal Correction, Partial Inferior Turbinectomy, Nose Scale, Deviated Nasal Septum

Introduction

Chronic nasal obstruction is a prevalent issue encountered by otolaryngologists, with various underlying causes like deviated nasal septum, turbinate hypertrophy, and other conditions. Among these, the deviated nasal septum is the most common culprit. Inferior turbinate hypertrophy secondary to chronic rhinitis may become irreversible, potentially due to dilated submucosal veins, fibrosis, or bony

expansion, rendering these patients resistant to medical management[1].

Despite the clinical significance of this phenomenon, it has received limited attention in the literature, with a lack of quantitative and qualitative data on the histological features of hypertrophic turbinates compared to normal ones. Similarly, there is insufficient evidence to determine whether these changes are permanent or reversible[2].

Many otolaryngologists perform septoplasty with or without turbinate reduction surgery, but the effectiveness of these procedures and the appropriate indications remain largely based on clinical judgment, as the literature lacks comprehensive data[3].

This prospective, randomized clinical study aimed to evaluate the subjective improvement in nasal symptoms using the Nasal Obstruction Symptom Evaluation scale, comparing the outcomes of septal correction alone versus septal correction combined with partial inferior turbinectomy[4]. The findings of this study can provide valuable insights to guide otolaryngologists in determining the most appropriate surgical approach for patients with nasal obstruction.

Materials And Methods:

The study enrolled 60 patients with septal deviation and contralateral inferior turbinate hypertrophy. The objectives were to:

1. Compare the symptomatic improvement in nasal complaints between patients who underwent septal correction with partial inferior turbinectomy and those who had septal correction alone.
2. Compare the surgical outcomes between the two groups.
3. Assess nasal patency before and after surgery using the cold spatula test.

After obtaining informed consent, detailed patient histories and clinical examinations were performed. Participants completed questionnaires using the Nasal Obstruction Symptom Evaluation scale to assess symptom severity. Patients were then alternately assigned to Group A or Group B. Group A underwent septal correction combined with partial inferior turbinectomy, while Group B received septal correction alone. Postoperatively, the patients' symptoms were re-evaluated using the NOSE scale at 15, 30, and 60-day intervals. The data was analyzed using statistical methods such as paired t-tests and ANOVA.

Grading of inferior turbinate size

Grade 1 Mild enlargement with no obvious nasal obstruction.

Grade 2 The inferior turbinate occupies half of the nasal cavity with nasal

Obstruction

Grade 3 Complete occlusion of nasal cavity[5].

Following the study, patients were counseled and written informed consent was obtained. Patients presenting with upper respiratory tract infection received a 5-day course of antibiotics. Preoperatively, an intramuscular injection of 0.5 ml tetanus toxoid was given, and lignocaine sensitivity tests were performed. Cotton strips soaked in 4% lignocaine with 1:100,000 adrenalin were packed in both nasal cavities 10 minutes prior to surgery.

In Group B, only septal correction surgery was performed, under either local or general anesthesia, with the patient in a reclining position with the head end of the table raised. Patients in Group A underwent septal correction combined with partial inferior turbinectomy.

After 48 hours, the nasal packs were removed, and 0.1% xylometazoline nasal drops were instilled, initially 3 drops in each nostril every 30 minutes for the first 2 hours, followed by 3 drops three times daily for the remaining 5 days.

On postoperative day 3, proper nasal douching was performed. Patients were advised to continue frequent nasal douching throughout the day. They were then discharged and asked to return for regular follow-up visits at 15, 30, and 60 days.

The Nasal Obstruction Symptom Evaluation scale was utilized to subjectively assess symptom severity. Scores were obtained preoperatively, and at 15-day, 30-day, and 60-day postoperative intervals. This scale evaluates 5 symptoms, with each symptom scored from 0 (minimum severity) to 4 (maximum severity), yielding a total maximum score of 20. The total score was then calculated as (Q1 + Q2 + Q3 + Q4 + Q5) x 100 / 20, resulting in a score ranging from 0 (least severe) to 100 (most severe). The change in pre- to

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postoperative scores at 15, 30, and 60 days was compared between Group A (septal correction with partial inferior turbinectomy) and Group B (septal correction alone), with each group comprising 30 patients.

Follow Up Schedule:

Patients were followed up meticulously at 15, 30, and 60 days after the surgery. During these visits, they were asked to complete questionnaires evaluating the severity of their symptoms using the validated Nasal Obstruction Symptom Evaluation scale, which were promptly recorded.

Results

The study population was predominantly young, with the most common age groups being 21-25 years and 26-30 years. Males outnumbered females, with a male-to-female ratio of 1.6:1. The most prevalent symptom in the study was nasal obstruction, present in 97 patients in Group A and 83% of those in Group B. The affected sides were equally distributed, with a slight predominance of the right side in Group A and the left side in Group B.

Septal spurs were the most common additional finding, observed in 14 patients in Group A and 15 in Group B. The cold spatula test revealed similar postoperative findings in both groups, but Group A patients exhibited more remarkable improvement compared to Group B at the 30-day and 60-day follow-ups. The final postoperative cold spatula test positivity was 30% for the right side and 27% for the left side in Group A, in contrast to 57% for the right side and 30% for the left side in Group B at 60 days.

The most common complication in the study was crusting, present in 67% of patients in Group A and 83% in Group B. The NOSE score was used for the subjective evaluation of patients' quality of life. The study showed highly significant postoperative improvement in both the septal correction and the septal correction plus partial inferior turbinectomy groups. Patients who underwent septal correction combined with partial inferior turbinectomy experienced greater overall symptomatic relief during the follow-up period compared to those who underwent septal correction alone. The improvement was gradual over 60 days, and the septal correction with partial inferior turbinectomy group demonstrated statistically significant symptomatic improvement at the 60-day follow-up compared to the septal correction group.

Discussion

The study population consisted predominantly of young adults, with the most common age groups being 21-25 years and 26-30 years. Male participants outnumbered females, with a male-to-female ratio of 1.6:1. This gender distribution aligned with findings from similar studies.

Nasal obstruction was the most prevalent symptom, affecting 97 patients in Group A and 83% of those in Group B. The affected sides were equally distributed, with a slight predominance of the right side in Group A and the left side in Group B.

Septal spurs were the most common additional finding, observed in 14 patients in Group A and 15 in Group B. The cold spatula test revealed more remarkable improvement in Group A compared to Group B at the 30-day and 60-day follow-ups, with the final postoperative positivity being lower in Group A.

Crusting was the most common complication, present in 67% of patients in Group A and 83% in Group B. The NOSE score was used to subjectively evaluate the patients' quality of life, and the results showed highly significant postoperative improvement in both groups. However, those who underwent septal correction combined with partial inferior turbinectomy experienced greater overall symptomatic relief during the follow-up period compared to those who underwent septal correction alone. This difference in symptomatic improvement was statistically significant at the 60-day follow-up.

The findings of the present study are in line with the majority of research, which supports performing partial inferior turbinectomy in addition to septal correction. Several studies have demonstrated that patients undergoing turbinate reduction surgery combined with septoplasty experience better subjective symptom improvement compared to those undergoing septoplasty alone[6]. Objective measures, such as acoustic rhinometry, rhinomanometry, and CT-based volume assessments, have also shown the benefits of combining turbinate reduction with septal correction, particularly in patients with unilateral septal deviation and compensatory contralateral turbinate hypertrophy[7]. These studies suggest that addressing both the septal deformity and the turbinate

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hypertrophy is necessary for optimal treatment of nasal obstruction in these patients. Additionally, histopathological evidence indicates significant bony expansion of the inferior turbinate, supporting the rationale for turbinate reduction at the time of septoplasty. Overall, the available evidence strongly supports the notion that partial inferior turbinectomy in conjunction with septal correction leads to greater symptomatic relief for patients with nasal obstruction compared to septal correction alone[8].

Several studies have demonstrated the benefits of submucous diathermy of the inferior turbinates for treating chronic hypertrophic rhinitis, particularly in non-allergic patients. Quine et al. objectively assessed the efficacy of this approach, showing improved nasal airflow and functional evidence of submucosal fibrosis following the surgery[9].

In contrast, some studies have suggested that turbinate reduction surgery may not offer additional benefits beyond what is achieved with septal correction alone. Illum's work found no detectable influence of turbinate surgery, while Nunez and Bradley showed that contralateral inferior turbinectomy did not further improve nasal obstruction beyond what was attained with septal surgery[10]. Kim et al.'s research on the effects of septoplasty alone on the inferior turbinate mucosa and bone also indicated that longer-term follow-up is needed to fully understand the outcomes[11].

Consistent with the majority of the studies reviewed, our present investigation concluded that turbinate reduction surgery in addition to septoplasty provides greater symptomatic relief compared to septoplasty alone. However, the studies where no significant improvement was seen with the addition of turbinate reduction surgery suggest the need for more extended follow-up[12].

The strengths of this study include the use of objective measures, such as the cold spatula test, and the validated NOSE score for subjective assessment.

The existing literature on outcomes after septoplasty has shown generally positive results, but many of these studies were retrospective in nature, relying on physician-reported outcomes rather than patient-based assessments. Some used telephone surveys or non-validated questionnaires to evaluate patient satisfaction. Prospective studies employing validated, patient-centered instruments specific to nasal obstruction are still needed to fully characterize the benefits of septal correction[13].

One retrospective study employed the Glasgow Benefit Inventory, a validated patient-reported instrument assessing the benefit of otolaryngologic interventions, but it was not specifically designed for evaluating nasal obstruction. Prospective studies on septoplasty have often utilized questionnaires not validated for nasal obstruction, physical examination findings, and/or objective measures like Gertner Podoshin plate or rhinometry, which remain largely experimental and require further investigation before being reliably used for outcome assessment. [14]Physical examination is subjective and prone to examiner bias, while objective measures frequently fail to correlate well with each other or with patient symptoms. Prior to the present study, there had been a lack of prospective research on septoplasty employing validated patient-reported outcome measures focused on nasal obstruction as the primary concern. Nonetheless, prospective studies on patient satisfaction have consistently reported high levels of satisfaction following septoplasty[15].

Prospective studies using unvalidated patient-reported outcome instruments have also identified improvements after septoplasty. One notable study utilized a validated sinusitis instrument and found improved scores following the procedure, though it found no changes in a global quality-of-life measure[16]. While several validated instruments exist for rhinosinusitis, they were developed for patients with rhinitis and/or sinusitis, and their content emphasizes symptoms like rhinorrhea, pressure, and cough. Although nasal obstruction can be a symptom of rhinosinusitis, and these instruments may address obstruction to some degree, they are not optimally suited for the specific study of nasal obstruction. A recent study suggested that two existing instruments show promise in correlating with nasal obstruction, but concluded that an instrument designed explicitly for this condition is needed.[17]

Eccles' research group has criticized the lack of standardization in the methods and instruments used to evaluate electrosurgical turbinate reduction, emphasizing the need for defined standards to enable meaningful progress in this area of clinical research[18].

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Consistent with the present study, the NOSE score has been recognized as a valuable subjective measure of nasal obstruction, allowing for assessment of pre- to post-operative improvements, as demonstrated by Stewart et al[19].

The current study's findings, which indicate that patients undergoing septal correction combined with partial inferior turbinectomy experienced the greatest symptomatic relief, corroborates the majority of the available evidence in the field.

Conclusion

This study aimed to investigate whether the addition of hypertrophied inferior turbinate reduction to septal correction enhances the outcomes for patients with nasal obstruction due to a deviated nasal septum and inferior turbinate hypertrophy. The findings demonstrate that combining septal correction with partial inferior turbinectomy yields greater symptomatic relief and improvement in disease-specific quality of life compared to septal correction alone. The NOSE score proved to be a valuable objective tool for assessing nasal obstruction in these patients.

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Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from the individual participants included in the study. Additional informed consent was obtained from the participant for whom identifying information is included in this article.

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Tables

TABLE 1: Intragroup comparison of the scores between Preop, postop15 days, postop30 days and postop 60 days using ANOVA test

		N	Mean	Std. Deviation	F	p value	Inference
Group A	Pre Op	30	62.6667	8.06582	127.159	0.000	The Anova comparison suggested that there was a significant reduction
	Post op 15 days	30	41.6667	9.58927			

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	Post op 30 days	30	29.8333	9.95536			in score between the preop and post op follow ups. To confirm exactly which follow ups showed significant difference Tukey Post test was performed, the results of which are displayed in table 7b
	Post op 60 days	30	17.5000	9.62665			
Group B	Pre Op	30	65.5000	9.68023	1.967	0.123	The Anova comparison suggested that there was no significant reduction in score between the preop and post op follow ups.
	Post op 15 days	30	64.1000	9.91811			
	Post op 30 days	30	62.0000	9.88555			
	Post op 60 days	30	59.6667	10.27328			

Table 2 Post Hoc analysis for Intragroup comparison of the scores between Preop, postop15 days, postop30 days and post op 60 days using Tukey HSD test

Group	**Time period of comparison**	**Sig.**	**Inference**	
A	Pre Op	Post op 15 days	0.000	Significant reduction in score was seen b/w preop and 15 days follow up
	Pre Op	Post op 30 days	0.000	Significant reduction in score was seen b/w preop and 30 days follow up
	Pre Op	Post op 60 days	0.000	Significant reduction in score was seen b/w preop and 60 days follow up

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	Post op 15 days	Post op 30 days	0.000	Significant reduction in score was seen b/w 15 days and 30 days follow up
	Post op 15 days	Post op 60 days	0.000	Significant reduction in score was seen b/w 15 days and 60 days follow up
	Post op 30 days	Post op 60 days	0.000	Significant reduction in score was seen b/w 30 days and 60 days follow up

Table 3. Intergroup comparison of the scores between two groups at Preop, postop15 days, postop 30 days and postop 60 days using T test

	group	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**	**t**	**Mean Difference**	**Std. Error Difference**	**p**	**Inference**
Preop	A	30	62.6667	8.06582	1.47261	-1.232	-2.83333	2.30047	0.223	No significant difference in 2 groups at preop
	B	30	65.5000	9.68023	1.76736					
Post15days	A	30	41.6667	9.58927	1.75075	-8.907	-22.43333	2.51875	0.000	The mean score of group A was significantly lower as compared to that of group B at postop 15 days
	B	30	64.1000	9.91811	1.81079					
Post30days	A	30	29.8333	9.95536	1.81759		-32.16667	2.56147	0.000	The mean score of

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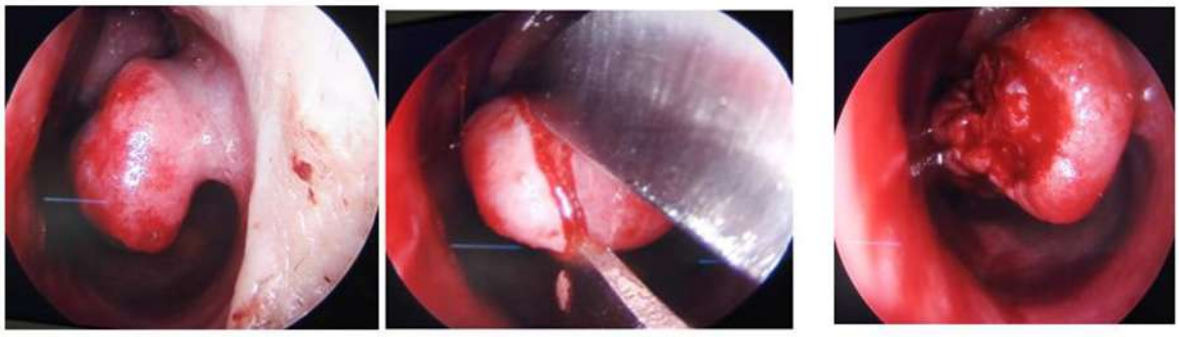
	B	30	62.0000	9.88555	1.80485	-12.558				group A was significantly lower as compared to that of group B at postop 30 days
Post60days	A	30	17.5000	9.62665	1.75758	-16.405	-42.16667	2.57043	0.000	The mean score of group A was significantly lower as compared to that of group B at postop 60 days
	B	30	59.6667	10.27328	1.87564					

Figure Legends

FIGURE 1 : Partial inferior turbinectomy with heyman scissors from right to left pre- operative, intraoperative and immediate post operative pictures



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