

Original Research Article

COMPARING THE EFFICACY AND OUTCOMES OF ENDOSCOPIC VERSUS CONVENTIONAL TECHNIQUE IN SEPTOTURBINOPLASTY

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ABSTRACT

Background: Septal deviation is a prevalent condition that impacts both nasal aesthetics and functionality, often necessitating surgical intervention. Advances in rigid endoscopy have introduced new endoscopic techniques, which are increasingly replacing traditional methods. This study aimed to compare endoscopic and conventional septoturbinoplasty procedures using both objective and subjective data to evaluate the advantages offered by endoscopic techniques in nasal septal surgery.

Materials and Methods: This prospective comparative study involved 60 patients, with 30 undergoing endoscopic septoturbinoplasty and the other 30 receiving conventional septoturbinoplasty. The study assessed outcomes based on improvements in nasal symptoms measured through subjective questionnaires, operation time, and postoperative complications.

Results: Preoperative NOSE questionnaire scores averaged 68.32±13.5 for the conventional group and 63.53±15.7 for the endoscopic group. Postoperatively, the scores were 7.43±8.2 for the conventional group and 5.35±6.1 for the endoscopic group. Additionally, the endoscopic technique demonstrated shorter operative times and fewer postoperative complications compared to the conventional method.

Conclusion: Both conventional and endoscopic techniques effectively correct septal deviations, as evidenced by significant improvements in patient symptom scores following surgery. However, endoscopic septoturbinoplasty offers advantages, including reduced operation time and a lower rate of complications.

Keywords: Endoscopic Septoturbinoplasty, Conventional Septoturbinoplasty, Nasal Septum Deviation, Mucosal Injury, Nasal Obstruction, Surgical Outcomes, Endoscopic Surgery Efficacy, Surgical Technique Evaluation.

INTRODUCTION

Septal deviation is a prevalent condition affecting a significant portion of the population. It is estimated that 22 percent of newborns and 90 percent of adults experience some degree of nasal septum deviation.^[1] The nasal septum plays a crucial role in both the aesthetic and functional aspects of the nose. Its alignment is essential for maintaining proper airflow and overall nasal symmetry. The surgical management of a deviated septum presents challenges even for highly skilled rhinology surgeons. This complexity arises because the nasal septum is a central structure in the nasal cavity, and its deviation can lead to various issues such as obstructed breathing, sinus infections, and aesthetic concerns. Effective correction requires a precise understanding of the septum's anatomy and careful

surgical techniques to restore its normal position and function. Despite advances in surgical methods, achieving optimal outcomes remains a demanding task for even the most experienced professionals in the field.^[2]

For patients experiencing symptoms related to septal deviation, surgical intervention is typically considered a viable treatment option.^[1] This procedure can be performed either under general anaesthesia or as an outpatient surgery, which is often preferred for its cost-effectiveness and convenience. Both approaches generally yield satisfactory results, ensuring good safety standards and high levels of patient satisfaction.^[3] Outpatient surgery allows for quicker recovery times and reduced overall costs while maintaining effective treatment outcomes. The introduction of rigid

endoscopes has significantly advanced the field of septal surgery in otorhinolaryngology, emphasizing tissue preservation and minimally invasive techniques. While both traditional and endoscopic methods aim to address deviated septums, there is a growing emphasis on techniques that preserve and realign the septum rather than simply removing it. As the benefits of endoscopic procedures become increasingly apparent, many surgeons are now favouring this modern approach over conventional methods. Lateral wall pathology is often linked with septal deviation, and addressing this pathology is crucial for successful septal surgery. Consequently, procedures such as inferior turbino-plasty and concha bullosa excision may be necessary to achieve optimal outcomes. The objective of this study was to evaluate and compare two different septoturbino-plasty techniques—endoscopic and conventional. By analyzing both objective measurements and subjective patient feedback, the study aimed to highlight the specific benefits that endoscopic methods offer in nasal septal surgery, thus providing insight into their effectiveness and advantages over traditional approaches.^[4]

MATERIALS AND METHODS

Study Type: Prospective Observational Study

Study Place: Great Eastern Medical School & Hospital Ragolu, Srikakulam

Study Time: February 2020- March 2021

Methodology

This study included patients presenting with symptomatic deviated nasal septum at our institute who were scheduled for septal surgery. Patients with additional nasal conditions such as uncontrolled allergic rhinitis, sinusitis, vasomotor rhinitis, nasal polyps, or those requiring revision septoplasty were excluded. Ultimately, 60 patients participated, with 30 undergoing endoscopic septoturbino-plasty and the other 30 receiving conventional septoturbino-plasty.

The decision regarding the surgical technique was based on the operating surgeon's expertise, the patient's individual case, and financial considerations. All patients underwent a preoperative Diagnostic Nasal Endoscopy within one week before the procedure, and the NOSE (Nasal Obstruction Symptom Evaluation) questionnaire was administered. The NOSE questionnaire includes five subjective questions assessing patient symptoms on a scale from 0 (no problem) to 4 (severe problem). For the conventional group, Cottle's pre-maxilla-maxilla approach was utilized. This technique involved creating inferior and superior tunnels on the concave side of the deviation and an inferior tunnel on the convex side to facilitate the removal of cartilage and bone, correcting the septal deformity. The anterior, posterior, and inferior tunnels were then merged into a single tunnel. Any lateral wall pathology was also

addressed, and inferior turbino-plasty was performed using bipolar cautery from posterior to anterior while preserving intervening mucosal islands.

In the endoscopic group, a complete or incomplete hemi-transfixation incision was made at the caudal end of the septum. Endoscopic mucoperichondrial elevation using a zero-degree endoscope was performed, with precise resection of overlapping or subluxated cartilage. Minimal wedge resections were carried out at target sites such as angulations or spurs, and shaving of the cartilage at the thick vomero-ethmoidal chondral junction was done if necessary. Postoperative follow-up included repeating the Diagnostic Nasal Endoscopy and NOSE questionnaire administration one month after surgery. Data on postoperative complications and operation times were collected. Pre- and postoperative questionnaire scores, along with objective findings, were compared between the conventional and endoscopic groups.

RESULTS

The study included a total of 60 participants, divided equally into two groups: 30 underwent endoscopic septoturbino-plasty and 30 received conventional septoturbino-plasty. Within the conventional septoturbino-plasty group, there were 24 males and 6 females, while the endoscopic septoturbino-plasty group consisted of 20 males and 10 females. The average age of participants was 40.79 years in the conventional group and 41.29 years in the endoscopic group. Table 1 illustrates the various types of septal deviations observed in the study. In the endoscopic group, 43.3% had posterior septal deviation, 10% had an S-shaped deviation, and 30% had a septal spur. In contrast, the conventional group had 50% with anterior deviation, 13.3% with an S-shaped deviation, and 26.6% with a septal spur. [Table 1]

NOSE Questionnaire Scores

Table 2 presents the mean NOSE questionnaire scores before and after surgery. Both groups exhibited a marked and statistically significant improvement in nasal symptoms. Although the mean post-operative NOSE questionnaire score was lower in the endoscopic group, this difference was not statistically significant when compared to the conventional group. [Table 2]

Operation Time

In the study, the average operation time for the conventional group was 1.228 hours (± 0.30 hours), while the endoscopic group had a mean operation time of 0.998 hours (± 0.27 hours). Although the endoscopic group had a shorter average operation time, this difference was not statistically significant.

Complications

In the study, the conventional group experienced 4 cases of synechiae and 1 case of a septal abscess. In contrast, the endoscopic group had only 1 case of synechiae and no cases of septal abscess. Both

groups had no occurrences of septal perforation or incomplete correction of deviation.

The higher incidence of synechiae in the conventional group can be attributed to a greater likelihood of mucosal injury during surgery. Such injuries may arise from inadequate visualization when raising the mucoperichondrial or mucoperiosteal flap or from trauma caused by the use of nasal speculum. The single case of septal abscess in the conventional group was likely a result of septal hematoma.

Endoscopic septoplasty, with its limited dissection and reduced intraoperative bleeding, generally results in fewer complications. Consequently, the overall rate of complications was higher in the conventional group compared to the endoscopic group.

In the study, a wax plate was used for 11 out of 60 patients following surgery, all of whom had

undergone conventional septoturboplasty. No wax plates were necessary for patients who received endoscopic septoturboplasty. Additionally, post-operative nasal packing was required for all 30 patients who had conventional septoturboplasty, whereas only 20 out of 30 patients who underwent endoscopic septoturboplasty needed nasal packing.

These findings underscore the advantages of endoscopic techniques in septal surgery. Endoscopic septoturboplasty involves less extensive dissection, which results in better visualization, reduced bleeding, and minimized mucosal injury. Consequently, this approach often eliminates the need for both wax plates and extensive nasal packing post-operatively. The improved precision and reduced trauma associated with endoscopic methods contribute to a more streamlined recovery process and fewer post-surgical interventions.

Table 1

Diagnosis	Conventional	Endoscopic	Chi-square test P value
1.Anterior	15 (50%)	5 (16.6%)	0.003
2.Posterior	3 (10%)	13 (43.3%)	
3.Both	4 (13.3%)	3 (10%)	
4.Spur	8 (26.6%)	9 (30%)	
5.Total	30	30	

Table 2

NOSE QUESTIONNAIRE	CONVENTIONAL		ENDOSCOPIC		MANN-WHITNEY U TEST, P VALUE
	MEAN	SD	MEAN	SD	
PRE OPERATIVE	68.32	13.5	63.53	15.7	0.489
POST OPERATIVE	7.43	8.2	5.35	6.1	0.354
DIFFERENCE	60.9	14.1	59.5	15.8	
Wilcoxon signed rank test p value	<0.001		<0.001		

DISCUSSION

The nasal septum plays a crucial role in both nasal aesthetics and function. Surgical management of the nasal septum can be challenging, even for the most experienced surgeons. As a result, mastering septal surgery is essential.

Research indicates that patient selection is critical for the success of endoscopic septoplasty. It is often recommended to focus on patients with posterior, less accessible deviations, as identified through thorough preoperative diagnostic nasal endoscopy. Our study adhered to this approach in patient selection.^[6,7]

Consequently, the subjective assessment of nasal obstruction, as measured by the NOSE questionnaire, showed only minimal differences between the conventional and endoscopic groups. This limited difference can be attributed to a selection bias, where the majority of patients with posterior septal deviations were chosen for the endoscopic technique. This selection bias may have influenced the outcomes, reflecting only marginal variations between the two surgical methods.

Hwang and McLaughlin highlighted the advantages of endoscopic septoplasty, emphasizing that this technique can potentially reduce morbidity and

postoperative swelling in cases of isolated septal deviations by concentrating dissection on the affected area. Additional benefits include enhanced visibility, particularly for posterior septal abnormalities, a smoother transition between septoplasty and sinus surgery, and its effectiveness as a teaching tool.^[8] Our study corroborated these findings. In the endoscopic group, the improved visualization and targeted approach to the deviated septum resulted in a lower complication rate and a shorter operation time. Another study Sardesai I et al, also highlights the advantages of endoscopic septoturboplasty over conventional septoturboplasty.^[9]

Several studies align with our findings, demonstrating that endoscopic septal surgery offers advantages such as improved outcomes, reduced surgery duration, and fewer postoperative complications compared to conventional methods. However, other research has found no statistically significant differences between conventional and endoscopic septoplasty groups when assessed through both subjective and objective measures.^[8-12,13]

The endoscopic technique has its own limitations, including the loss of binocular vision and the need for frequent cleaning of the endoscope's tip,

especially in cases with significant bleeding. In our study, we emphasized that proficiency with the endoscope is crucial for successful outcomes, and all surgeries were performed by senior consultants experienced in using nasal endoscopes.

Our study does have some limitations. The small sample size and the fact that it was conducted at a single institution are significant drawbacks. Additionally, the use of subjective assessment scales introduces potential bias. Future research would benefit from a larger sample size and uniform objective evaluation to provide a more comprehensive analysis. Despite these limitations, our study adds valuable evidence to the literature supporting the benefits of endoscopic septoturboplasty.

CONCLUSION

Both conventional and endoscopic techniques are effective in correcting septal deviations, as evidenced by significant improvements in patient symptom scores after surgery. However, endoscopic septoplasty offers several advantages over conventional methods. It generally results in shorter operation times and a lower complication rate. Additionally, the endoscopic approach allows for more controlled and precise surgery, with reduced intraoperative mucosal injury and bleeding, which lessens the need for postoperative nasal packing or wax plate splinting. Furthermore, the enhanced visualization provided by the endoscope offers junior doctors and trainees a valuable opportunity to gain a clearer understanding of nasal septum anatomy and the various types of septal deviations.

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