

Original Research Article

A comparative study of efficacy and outcomes of endoscopic versus conventional technique in septoturbinateplasty

Ishan Sardesai*, D. R. Nayak, Aditi Ravindra, Shama Shetty

Department of Otorhinolaryngology, Kasturba Medical College, Manipal, Karnataka, India

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*Correspondence:

Dr. Ishan Sardesai,

E-mail: ishansardesai@hotmail.com

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ABSTRACT

Background: Septal deviation is a very common clinical entity which often affects nasal aesthetics and functionality requiring surgical correction. With the advent of rigid endoscopy, newer techniques of endoscopic surgery have come into place that are replacing conventional methods. The aim of the study was to compare the two septoturbinateplasty procedures (endoscopic and conventional) using both objective and subjective data and thereby determine the advantages an endoscope provides during nasal septal surgery.

Methods: It is a prospective comparative study of 56 patients out of which 28 patients underwent endoscopic septoturbinateplasty and the remaining 28 underwent conventional septoturbinateplasty. Outcomes measured were improvement of nasal symptoms following the surgery based on subjective questionnaire data collected, operation time and post-operative complications.

Results: The mean NOSE questionnaire scores pre-operatively were 67.32 ± 12.4 for the conventional group and 64.64 ± 14.9 for the endoscopic group. The post-operative scores were 6.43 ± 7.2 for the conventional group and 4.64 ± 6.8 for the endoscopic group. Similarly, the operative time as well as the rate of post-operative complications were lesser in the endoscopic technique compared to the conventional technique.

Conclusions: Both conventional and endoscopic techniques are effective in correcting the septal deviation as proved by significant subjective improvement in patient symptom scores post-surgery. The use of an endoscope, on the other hand, results in a shorter operation time and a lower complication rate after surgery.

Keywords: Rhinology, Septoplasty, Endoscopic surgery, Septoturbinateplasty

INTRODUCTION

Septal deviation is a common disease that affects 22 percent of newborns and 90 percent of adults.¹ The nasal septum is extremely important in determining nasal aesthetics and function. Even the most experienced rhinology surgeons face difficulties when it comes to the surgical management of the nasal septum.²

In the treatment of patients with symptoms, surgical intervention is usually considered.¹ It can be done under general anaesthesia or as an out-patient surgery with good

cost-effectiveness, satisfactory quality, and good safety and patient satisfaction.³

With the advent of rigid endoscopes in the clinical practise of otorhinolaryngologists, advances have been made in septal surgery as well, with more focus on tissue preservation and minimal invasion. Although both conventional and endoscopic procedures aim to remove the deviated part of the septum, increasing focus has been placed on septal preservation, realignment, or a mix of the two. As the advantages of endoscopic technique are coming to light, many surgeons are now preferring it over traditional approach.⁴

Lateral wall pathology is frequently associated with septal deviation, and its treatment is required for successful septal surgery. Therefore, inferior turbinoplasty and concha bullosa excision needs to be done when required.

The aim of the study was to compare the two septoturboplasty procedures (endoscopic and conventional) using both objective and subjective data and thereby determine the advantages an endoscope provides during nasal septal surgery.

METHODS

This was a prospective, observational study conducted by the Department of Otorhinolaryngology at a Tertiary Care Hospital in South India over a period of 1.5 years between October 2019 to March 2021.

Patients who presented with a symptomatic deviated nasal septum to our institute and were subsequently planned for septal surgery were included in the study. Patients who had other concomitant nasal pathologies like uncontrolled allergic rhinitis, sinusitis, vasomotor rhinitis, nasal polyps etc., as well as cases of revision septoplasty were excluded from the study. Consequently, a total of 56 patients participated in the study out of which 28 patients underwent endoscopic septoturboplasty and the remaining 28 underwent conventional septoturboplasty. The choice of surgery was taken by the operating surgeon depending on his skill, feasibility in the patient as well as patient affordability. A pre-operative Diagnostic Nasal Endoscopy was done in all the patients within 1 week of the planned procedure and the NOSE (Nasal obstruction symptom evaluation) subjective questionnaire was administered. The NOSE questionnaire consists of 5 subjective questions based on patient symptomatology with responses ranging from 0 (not a problem) to 4 (severe problem). In the conventional group, Cottle's pre-maxilla-maxilla approach was followed. This involved making inferior and superior tunnel on concave side and inferior tunnel on convex side of the deviation to facilitate removal of cartilage and bone to correct the septal deformity. Anterior, posterior and inferior tunnels were raised and then combined into a single tunnel.⁵ Lateral wall pathology was corrected along with septal deformity in all cases. Inferior turbinoplasty was done

using bipolar cautery from posterior to anterior direction with preservation of intervening islands of mucosa.

In endoscopic technique, a complete or incomplete hemitransfixation incision at caudal end of septum was done. Limited endoscopic mucoperichondrial elevation using zero degree. Endoscope was carried out with precise resection of overlapping/subluxated cartilage. Minimal wedge resection at target site (angulation, spur etc.,) was employed. Shaving of cartilage at thick vomero-ethmoidal chondral junction in case of thick septum was done. Diagnostic nasal endoscopy and NOSE questionnaire administration was repeated 1 month post-operatively. Objective data such as post-op complications and operation time was collected. Pre and post operative questionnaire scores as well as objective findings were compared between the conventional and endoscopic groups.

Data was tabulated on Microsoft Excel and statistical analysis was done using the SPSS software version 22 (IBM SPSS Statistics, Somers NY, USA). Categorical data was represented in the form of frequencies and proportions. Chi square test or Wilcoxin signed rank test was used as test of significance for qualitative data. Continuous data was represented as mean and standard deviation. ANOVA was used as the test of significance to identify the mean difference between more than two quantitative variables. P value of <0.05 was considered as statistically significant.

RESULTS

A total of 56 subjects were recruited in the study, 28 in the endoscopic septoturboplasty group and 28 in the conventional septoturboplasty group. In the group who underwent conventional septoturboplasty, 23 patients were male and 5 were female and in the group who underwent endoscopic septoturboplasty, 19 patients were male and 9 were female. The mean age of our study population was 30.79 years in the conventional group and 31.29 years in the endoscopic group. Table 1 depicts the various types of deviated septums that were seen in our patient population. 42.9% of the patients in endoscopic group had a posterior septal deviation, 7.1% had a S shaped deviation and 35.1% had a septal spur. In the conventional group, 50% had an anterior deviation, 17.9% had an S shaped deviation, 25% had a septal spur.

Table 1: Types of septal deviation.

Diagnosis	Conventional		Endoscopic		Chi-square test P value
	N	%	N	%	
Anterior	14	50.0	4	14.3	0.002
Posterior	2	7.1	12	42.9	
Both	5	17.9	2	7.1	
Spur	7	25.0	10	35.7	
Total	28	100.0	28	100.0	

Table 2: Mean pre and post operative NOSE questionnaire scores.

Nose questionnaire	Conventional		Endoscopic		Mann-Whitney U test, P value
	Mean (median)	SD	Mean (median)	SD	
Pre-operative	67.32 (65)	12.4	64.64 (70)	14.9	0.492
Post-operative	6.43 (5)	7.2	4.64 (0)	6.8	0.320
Difference	60.9 (60)	13.2	60.0 (70)	15.8	
Wilcoxon signed rank test p value	<0.001		<0.001		

NOSE questionnaire scores

The mean pre and post operative NOSE questionnaire scores are depicted in Table 2. In both groups, a dramatic improvement in nasal symptoms was noted which was statistically significant. The mean post operative NOSE questionnaire score was lower in the endoscopic group, however the comparison was not statistically significant.

Operation time

In conventional group, the mean operation time was 1.018 hours (± 0.20) and in endoscopic group, the mean operation time was 0.973 hours (± 0.21). Therefore, mean operation time was noted to be lower in endoscopic group. However, this comparison was not found to be statistically significant.

Complications

In conventional group, 5 cases of synechiae were observed and 1 case of septal abscess. In endoscopic group, 1 case of synechiae was observed and no incidence of septal abscess. There were no cases of septal perforation, incomplete correction of deviation in either of the 2 groups.

Higher incidence of synechiae in conventional group is due to the increased chance of mucosal injury in such surgeries. Such injuries may occur while raising the mucoperichondrial or mucoperiosteal flap without adequate visualisation or due to trauma from the use of nasal speculum. The 1 case of septal abscess was probably a consequence of septal hematoma in a patient who underwent conventional septoplasty. Due to limited dissection and less intra-operative hemorrhage, such complications are usually not seen in endoscopic septoplasty. Therefore, overall incidence of complications was higher in conventional as compared to endoscopic group.

Wax plate was used in 9 of the 56 patients following surgery. All these patients were patients who underwent conventional septoturbinatectomy. Wax plate was not needed in any of the endoscopic septoturbinatectomy cases. Similarly, in conventional septoturbinatectomy, post-operative nasal pack was required and placed in all 28 patients whereas it was needed in 20 out of the 28 cases who underwent endoscopic septoturbinatectomy. This highlights the value and importance of endoscope in

septal surgery as there is limited dissection, better visualization, less hemorrhage, and less mucosal injury. Thus, in endoscopic septoturbinatectomy, the use of wax plate and post operative nasal packing may not be required.

DISCUSSION

Nasal aesthetics and nasal function are largely determined by the nasal septum. Even the most experienced nose surgeons face difficulties when it comes to surgical management of the nasal septum. Therefore, learning and mastering septal surgery is of great importance.

Studies have suggested that a proper selection of patients is important when it comes to endoscopic septoplasty with preference given to more posterior, inaccessible deviations as determined by a detailed preoperative diagnostic nasal endoscopy.^{6,7} A similar strategy was followed in our study with respect to patient selection. Perhaps the subjective assessment with respect to the NOSE questionnaire that was done in our study showed only marginal difference between the two groups due to this patient selection bias wherein majority of the cases with posterior septal deviations were selected for endoscopic approach.

Hwang and McLaughlin shared their experience with endoscopic septoplasty, stating that the technique's key benefit is the potential to reduce morbidity and postoperative edema in isolated septal deviations by confining dissection to the deviated area.⁸ Easier visibility, especially in posterior septal abnormalities; improved surgical transition between septoplasty and sinus surgery; and usage as an efficient teaching tool are among the other benefits. We noted similar results in our study. In endoscopic group, due to better visualisation and focus on specifically deviated part of the nasal septum, complication rate was noted to be lower and also, operation time was reduced.

While there are several studies that are in tandem with our results showing superiority of endoscopic septal surgery in terms of better results, reduced duration of surgery and lesser post operative complications, there are other studies which showed no statistically significant difference between the conventional and endoscopic septoplasty groups, as measured by subjective and objective evaluation.^{8-12,13} The endoscope has its own set

of restrictions, including the loss of binocular vision and the necessity for frequent cleaning of the endoscope's tip, particularly when there is more bleeding.¹⁰ We noted that for success of endoscopic septal surgery, familiarity and proficiency with the use of endoscope is essential and each surgery was performed only by senior consultants well versed with the use of nasal endoscope. However, there were certain limitations in our study. A small sample size in a single institution being the major drawback. In addition, we employed subjective assessment scales for comparison of the two methods, which is predisposed to inherent bias. A larger sample size within both conventional and endoscopic categories with a uniform objective assessment is needed for better analysis. Nevertheless, we are certain this study contributes significantly to the current body of evidence in literature favouring endoscopic septoturbino-plasty.

CONCLUSION

Both conventional and endoscopic techniques are effective in correcting the septal deviation as proved by significant subjective improvement in patient symptom scores post-surgery. The use of an endoscope, on the other hand, results in a shorter operation time and a lower complication rate after surgery. Endoscope also helps in more controlled and precise surgery. Intra-operative mucosal injury and intra operative hemorrhage is less and therefore there is a reduced need for post operative nasal packing/wax plate splinting. In addition, due to improved visualization, endoscopic septoplasty provides junior doctors and trainee surgeons an opportunity to better understand the anatomy of the nasal septum and pathological types of deviation.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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