

Comparative Observational Analysis of Outcome of Conventional Septoplasty and Endoscopic Septoplasty at Tertiary Care Facility, Jaipur

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Abstract

Introduction: Septoplasty, that is, surgical correction of the deviated nasal septum, is the most common ear, nose, and throat operation.

Aim: The aim of the study was to compare the objective and subjective outcome of traditional septoplasty and endoscopic septoplasty (ES).

Materials and Methods: This hospital-based, observational, and prospective study was conducted at tertiary care facility from June 2017 to September 2020. A total of 325 patients were included in the study and out of them, 168 (51.7%) underwent conventional septoplasty and 157 (48.3%) underwent ES. Pre- and post-operative assessments included nasal endoscopy, rhinomanometry, and nasal obstruction and septoplasty effectiveness scale questionnaire. The post-operative evaluation was performed at 3 months after surgery. Pain was assessed using a visual analog scale during recovery (4 h after the removal of nasal packaging). All patients underwent an endoscopic follow-up at 7, 15, 30, and 90 days after surgery. Data were analyzed using Microsoft Excel 2019.

Results: There was no difference in effectiveness of both techniques in decreasing nasal obstruction and discharge ($P > 0.05$). Post-operative complications such as pain, synechiae, early post-operative bleeding, septal tears, and incomplete correction are less frequent in the endoscopic group ($P < 0.05$). The rhinomanometric analysis reveals improvement in both groups ($p < 0.05$), however the difference between the two groups was not significant ($p > 0.05$). Subjective questionnaires show a good symptoms relief with an improved quality of life.

Conclusions: The present study shows that both the techniques are effective in reducing nasal obstruction and related symptoms with fewer overall complications in the endoscopic approach. Thus, endoscopic approach can be a valuable teaching tool.

Key words: Conventional septoplasty, Deviated nasal septum, Endoscopic septoplasty, Outcome

INTRODUCTION

The term DNS refers to the deviated nasal septum, which is one of the leading causes of the nasal obstruction. The nasal septal deviation is detected in 19% of newborns, 37% of children, and 89% of adults.^[1-3] It can lead to recurrent

infections of the paranasal sinuses and, for some patients, it may be associated with contact point headaches.^[4]

Surgical correction of the deviated nasal septum is known as septoplasty. It is the most common ear, nose, and throat (ENT) operation in adults.^[5] It aims to straighten the deviated nasal septum. There are two approaches of septoplasty: Conventional septoplasty (CS) by means of an external light source and endoscopic septoplasty (ES) which is done using endoscope.

The main advantage of ES over CS is the better visualization of septal deformities, allowing more conservative and less

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invasive surgery, even in revision cases. The endoscopic view provides an excellent teaching tool.^[6] A recent meta-analysis by Hong *et al.*^[7] underlined the ongoing debate regarding which approach had better outcomes and fewer complications and concluded that endoscopic view has better outcomes compare to conventional, though the findings seem to be inconclusive due to low quality inclusion cases.

The aim of the present study was to compare post-operative outcomes and the rate of complications in patients who underwent either endoscopic or CS without coprocedures. Post-operative outcomes were assessed by means of objective (active anterior rhinomanometry [RMM] and subjective measures (visual analog scale [VAS] for pain and nasal obstruction and septoplasty effectiveness scale [NOSE])^[4] at 3 months after surgery.

MATERIALS AND METHODS

This hospital-based, observational, and prospective study was conducted in the Department of Otorhinolaryngology and Head Neck Surgery at S.M.S. Medical College and Attached Group of Hospitals, Jaipur from June 2017 to September 2020 after clearance from the Ethical Committee.

All the patients above 18 years of age presented with only complaint of nasal obstruction and gross deviated nasal septum were included in the study. Patients with associated complaints of vasomotor or allergic rhinitis, acute or chronic rhinosinusitis, having a history of previous nasal surgery, and for rhinoplasty, and/or turbinate surgery and/or sinus surgery were excluded from the study. Total 500 patients attended ENT outpatient department with complaint of nasal obstruction and gross deviated nasal deviation. Out of these, 125 had associated complaint of sinusitis and gross external nasal deformity and 50 patients were below 18 years of age. Hence, 175 patients were excluded from the study. A total of 325 patients were included in the study and out of them, 168 (51.7%) underwent CS and 157 (48.3%) underwent ES. Pre- and post-operative assessments included nasal endoscopy, RMM, and NOSE questionnaire. The post-operative evaluation was performed at 3 months after surgery. Pain was assessed using a VAS during recovery (4 h after the removal of nasal packaging). CS was performed with headlight illumination, nasal speculum, and Freer elevator. After decongestion with adrenaline and submucosal injection of local anesthesia (xylocaine 2% with epinephrine), a mucosal hemi transfixion incision was performed with a 15-blade scalpel. Then, an elevator was used to elevate a

mucoperichondrial flap and the quadrangular cartilage was incised anteriorly. A contralateral mucoperichondrial flap was then raised. The bony septal deviation was incised carefully with a dovetail scalpel and hammer instrument. The incised cartilage and bone were then removed *en bloc* using Weil forceps. Elevated flaps were laid back down. Mucosal incision was sometimes fixed with reabsorbable stitches and nasal cavities were packed with finger glove coated Merocel for 24 h. ES was carried under general anesthesia, using a zero-degree 4 mm endoscope. After the infiltration on both sides of the septum with xylocaine 2% with pinephrine, a hemitransfixion incision was made with elevation of the mucoperichondrial flap using the suction elevator under direct endoscopic visualization. Flap raising continued bilaterally to completely dissect the septal deformity. Cartilage or bone was excised with punches, endoscopic scissors, or forceps. The flaps were repositioned back after suction clearance, without sutures, and the nasal cavities were packed with a finger glove coated Merocel that was removed after 24 h. All patients underwent an endoscopic follow-up at 7, 15, 30, and 90 days after surgery.

RESULTS

[Table 1] shows that total 325 patients underwent septoplasty. Out of these, 168 (51.7%) underwent CS and 157 (48.3%) underwent ES. Mean age of participants of conventional group and endoscopic group was 42.5 ± 11.4 and 44.6 ± 12.3 years, respectively. Male to female ratio was 93:75 in conventional group and 95:62 in endoscopic group. Preoperatively and postoperatively, there was no statistically significant difference in mean NOSE score, RMM score, and VAS score in between patients of both study groups ($P > 0.05$).

There was a statistically significant reduction in NOSE score in both the groups CS (pre 12.3 ± 2.1 vs. post $4.5 \pm$

Table 1: Comparison of variables between patients of both study groups

Variable	CS (n=168)	ES (n=157)	P-value
Age (Years)	42.5±11.4	44.6±12.3	>0.05
Male: Female	93:75	95:62	>0.05
NOSE score			
Pre-operative	12.3±2.1	13.1±2.3	>0.05
Post-operative	4.5±1.1	3.8±1.2	
RMM score			
Pre-operative	0.91±0.08	0.87±0.08	>0.05
Post-operative	0.26±0.06	0.25±0.07	
VAS score			
Pre-operative	2.4±0.8	2.6±0.9	>0.05
Post-operative	8.1±0.9	8.3±0.8	

CS: Conventional septoplasty, ES: Endoscopic septoplasty, VAS: Visual analog scale, RMM: Rhinomanometry, NOSE: Nasal obstruction and septoplasty effectiveness scale

1.1; $P < 0.05$) and in ES group (pre 13.1 ± 2.3 vs. post 3.8 ± 1.2 ; $P < 0.05$). Similarly, there was a significant reduction in RMM score from pre-operative to post-operative in both study groups ($P < 0.05$). There was a statistically significant increase in mean VAS score of patients in both study groups (CS – pre 2.4 ± 0.8 vs. post 8.1 ± 0.9 and ES – pre 2.6 ± 0.9 vs. post 8.3 ± 0.8).

[Table 2] shows that the number of patients who had hemorrhage after CS was 25 (14.9%) which was significantly ($P < 0.05$) higher than patients of ES group 11 (7%). Similarly, the number of patients who had post-operative complications such as adhesion, persistent nasal deviation, and septal tear in CS group was significantly higher than patients who had same complications in ES group ($P < 0.05$).

DISCUSSION

DNS may lead to remarkable decrease in quality of life. The present study depicted that both endoscopic and traditional septoplasty approaches are effective in improving post-operative nasal function as well as subjective nasal functionality measured by patient self-assessment at 3 months after surgery, in agreement with the recent literature.^[4,8-15] Brennan *et al.*^[16] stated that ideal septoplasty procedure should correct the deviation without any complication. The present study included conventional and ES without associated nasal surgery. Thus, it remained to be a more objective test of evaluating the two techniques. Paradis and Rotenberg^[17] found that both CS and ES showed significant improvement in the NOSE score after septoplasty and there was no superiority between both techniques according to the NOSE scale. In the present study, similar outcomes were obtained, NOSE and global quality of life scores (VAS scores) significantly improved postoperatively. In the present study, both septoplasty techniques were not superior to each other according to the NOSE and VAS. In the present study and literature, there was no difference between two techniques in terms of improvement in quality of life. This situation may be related with the absence of serious or major complications such as persistent deviation, synechia, or septal perforation that influenced the patient’s quality of life in long-term.

Table 2: Distribution of post-operative complications in both study groups

Complications	CS (n=168)	ES (n=157)	P-value
Hemorrhage	25 (14.9)	11 (7)	0.037
Adhesions/Synechiae	10 (6)	2 (1.3)	0.04
Persistent deviation	34 (20.2)	9 (5.7)	<0.001
Septal tear	29 (17.3)	12 (7.6)	0.015

CS: Conventional septoplasty, ES: Endoscopic septoplasty, VAS: Visual analog scale, RMM: Rhinomanometry, NOSE: Nasal obstruction and septoplasty effectiveness scale

The incidence of some complications in the ES group in the present study was significantly lower in accordance with the literature. Intra- and post-operative hemorrhage rates were noted statistically more frequent in CS group. Similarly, Sathyaki *et al.*^[13] reported that hemorrhage was more common in cases who underwent CS. The probable cause of this is that more brutal manipulations such as excision of inferior bone deviation in CS. In the present study, intra-operative mucosal flap laceration incidence was statistically less common in ES group compared to CS group. In a systematic review by Hong *et al.*,^[7] the risk developing flap laceration in CS patients was 1.8 times (RR: 1.84 [95% CI, 1.27–2.68], $P = 0.001$) greater than the patients who underwent ES.

ES was also associated with a significantly less persistent septum deviation rates 5.7% in comparison to CS (20.2%), that is, $P < 0.001$. On the other hand, the persistent deviation was not different between the two groups in a few literatures.^[12,13]

The present study highlighted some remarkable advantages in support of ES technique. ES approach seemed to be least invasive, with minor tissue handling, leading to less post-operative complications. Functional objective and subjective results were good over CS. Finally, in ES, the video assistance allows the junior surgeons to better understand the procedure, acquiring the technique and being supervised by a senior when operating alone and thus should be considered as an excellent and effective teaching tool.

CONCLUSIONS

The present study shows that following endoscopic and CS, there was a significant improvement in RMM score, NOSE, and VAS score; however, the difference between the two groups was not significant ($P < 0.05$).

Post-operative complications such as hemorrhage, nasal adhesions, persistent septal deviation, and septal tear were significantly lower among patients who undergone ES compared to patients who had conventional approach. Thus, among both techniques, ES could be a better approach in management of septoplasty.

Limitations

The main limitation of the present study is the absence of randomization. Further studies need to be done to determine which is better, whether endoscopic or CS.

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