

Original Research Article

Surgical outcome comparison between endoscopic septoplasty and conventional septoplasty among patients with nasal septal deviation

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ABSTRACT

Background: When compared with standard head light technique, endoscopic septoplasty provides important advantages which include adequate visualization, room for instrumentation during functional endoscopic sinus surgery, access to para nasal sinuses and for other surgeries like trans-septal approach to the sphenoid sinus, visualization and stoppage of post-nasal bleeds. The aim of the study was to assess and compare the surgical outcome between endoscopic septoplasty and conventional septoplasty techniques in terms of anatomical correction and its complications.

Methods: A prospective clinical study was conducted on hundred patients with nasal obstruction. Group A patients (n=50) underwent conventional septoplasty and group B (n=50) patients were operated by endoscopic septoplasty technique. Patients were subjected to diagnostic nasal endoscopy examination before and after surgery. Post-operative complications like trauma to lateral wall of nose, injury to cribriform plate, post-operative epistaxis, post-operative septal hematoma and septal abscess if occurred were noted.

Results: Post-operatively diagnostic nasal endoscopy results show that there was a statistically significant improvement in endoscopic septoplasty group compared to conventional septoplasty and similarly the mean nasal obstruction symptom evaluation score. The most common post-operative complications which were occurred are synechiae and septal perforation and both these complications were more common among the conventional septoplasty group and the difference was found to be statistically significant.

Conclusions: The study showed a better surgical outcome with a lesser complication among the endoscopic septoplasty as compared to conventional septoplasty. The only disadvantage of using endoscopic septoplasty was of binocular vision and repeated cleaning of the endoscope.

Keywords: Conventional septoplasty, Endoscopic septoplasty, Diagnostic nasal endoscopy, NOSE score

INTRODUCTION

Nasal septal deformities (NSD) were found to be very common among adults with the incidence ranging between 70 to 90%.¹ It is being unnoticed as most of the time the patient will be asymptomatic. The most common etiology for NSD is irregular development of the naso-

maxillary complex followed by nasal trauma particularly at the time of child birth. The importance of nasal trauma during delivery was stressed up because studies had shown that NSD prevalence was very much high among the children who were delivered through vaginal delivery compared to the children delivered through cesarean section.²

Septoplasty is the commonest procedure done for correction of NSD, but as such many medical text books quotes different modes of treatment based on the underlying pathology and each of the procedure has its own merits and demerits.^{3,4} An ideal surgical correction of the nasal septum should satisfy the following criteria : (a) should relieve the nasal obstruction; (b) should be conservative; (c) should not produce iatrogenic deformity; (d) should not compromise the osteomeatal complex and (e) must have the scope for a revision surgery, if required later.^{5,6}

The major drawback of the conventional septoplasty is its high rate of complications because of its poor visualization and relative inaccessibility and further it leads to overexposure of the septal framework which thereby reduces the scope for a revision surgery.⁷ So, septoplasty was not able to satisfy the criteria for ideal surgical correction for nasal obstruction.

In order to overcome the above mentioned drawbacks, later in 1991 Lanza et al and Stammberger introduced endoscopic nasal septoplasty.^{8,9} This procedure aimed to improve surgical access to middle meatus with adequate visualization, giving room for instrumentation during functional endoscopic sinus surgery and a good access to para nasal sinuses.¹⁰ The major limitation of this procedure is it has limited indications such as isolated septal deformity and in patients with densely adherent septal mucosal flaps requiring revision septoplasty.¹¹

As of today, very few studies were conducted in this part of India to compare the surgical outcome between conventional septoplasty and endoscopic septoplasty and so this study was undertaken to compare the effectiveness between these two procedures for deviated nasal septum.

Aim

The objective of the study was to assess and compare the surgical outcome between endoscopic septoplasty and conventional septoplasty techniques in terms of anatomical correction and its complications.

METHODS

A prospective clinical study was conducted on hundred patients with nasal obstruction attributed to septal deviation, between May 2018 to August 2019. This study was conducted in the Department of ENT at K D Medical College Hospital and Research Centre, Mathura (U.P). The study was started after getting the clearance from the institutional ethical committee. All patients with symptomatic deviated nasal septum were included for the study. Patients under the age of 17 years, with nasal polyposis, patients with allergic rhinitis, patients undergoing septoplasty with other nasal surgeries and revision septoplasty were excluded from the study.

The selected 100 patients were divided into two groups of 50 each. These patients were evaluated by detailed history taking about any complaints attributable to deviated nasal septum. Complete ENT examination was done in every patient and they were posted for diagnostic nasal endoscopy (DNE). They were advised to take medical line of treatment depending upon the DNE findings and asked to review in two weeks. Patient was asked for improvement in symptoms. Severity of symptoms was analyzed with help of NOSE instrument and was documented. The nasal obstruction symptom evaluation (NOSE) survey is a validated disease specific instrument designed to measure nasal obstruction. It is commonly used in otolaryngology practices to provide an objective measure of nasal obstruction. It is a brief questionnaire consisting of 5 self-rated items, each scored from 0 to 4. The NOSE score represents the sum of the responses to the 5 individual items and ranges from 0 to 20.¹²

Patients were subjected to second DNE and types of DNS and associated findings like HIT, Polyps, and Sinusitis were noted. Patients were advised to undergo X-ray of paranasal sinus water's view. In cases of gross DNS which gave difficulty in passing endoscope during DNE were subjected to computed tomography (CT) scan to know the patterns of nasal obstruction. Informed consent was obtained from all the patients who were enrolled for the study. Group A patients underwent conventional septoplasty and group B patients were operated by endoscopic septoplasty technique. Standard technique of operation was followed for both conventional and endoscopic septoplasty. Intra-operatively following parameters were noted: duration of surgery, blood loss during surgery, associated turbinate procedure. Nasal packing was done for all cases in both groups with Vaseline nasal packs and I.V. antibiotics were started. Patients of both groups were discharged with one week of antibiotics and analgesics, decongestant nasal drops were given for 3 days followed by saline nasal drops till next visit.

The follow-up period of patients in this study ranged from 1 month to 3 months. Post-operative complications like trauma to lateral wall of nose, injury to cribriform plate, post-operative epistaxis, post-operative septal hematoma and septal abscess if occurred were noted. Nasal diagnostic endoscopy was done at the end of 3rd month of follow-up to look for persistence of anterior/posterior deviation or spur, formation of synechiae, persistent pathology of turbinates, presence of discharge in middle meatus.

All data were entered and analysed using SPSS version 21. Chi-square test was applied for deriving the statistical inference between the two techniques considering $p < 0.05$ as statistically significant.

RESULTS

Table 1 shows the age and gender wise distribution of the study subjects. It is seen from the table that the minimum age of the study subjects was 18 years and the maximum age was 52 years and majority of the subjects were in the age group between 20 and 40 years among both the groups and the males were more in number than the females. The mean age among both the groups are almost similar. The commonest symptom among the study subjects of both the groups was nasal obstruction, followed by headache, anosmia, nasal discharge and nasal bleed. All patients in this study were examined in detail, an anterior rhinoscopy was performed to evaluate for any pathology in the nasal cavity. Then diagnostic nasal endoscopy was done preoperatively to record all the findings. The most common finding of DNE was posterior septal deviation followed by anterior septal deviation and the other findings were hypertrophied inferior turbinate, high septal deviation and septal spur and the distribution of the DNE findings between the two groups did not show a statistically significant difference (Table 2). The nasal surgical questionnaire for continuous evaluation of nasal septoplasty was administered to all the patients and the mean score was 55.6 and 56.6 pre-operatively among the conventional septoplasty and

endoscopic septoplasty group (Table 2). The duration of surgery in conventional septoplasty and endoscopic septoplasty group was almost similar in the range of 35 mins, whereas the duration of hospital stay after the surgery was found to be more among the conventional group (2.2 days) when compared to the endoscopic septoplasty group (1.5 days) and the difference was found to be statistically significant (Table 3). The post operative DNE findings had shown a significant improvement in both the groups when compared to the pre-operative findings similarly the mean nose score. The comparison of the DNE post-operatively between the two groups had shown a statistical significant improvement in endoscopic septoplasty group compared to conventional septoplasty and similarly the mean nose score was comparatively lesser among endoscopic septoplasty group than that of the conventional septoplasty and the difference was found to be statistically significant ($p < 0.05$) (Table 4). The most common post-operative complications which were occurred are synechiae and septal perforation and both these complications were more common among the conventional septoplasty group than that of the endoscopic septoplasty group and the difference was found to be statistically significant ($p < 0.05$) (Table 5).

Table 1: Age and gender wise distribution of the study subjects.

Age group (in years)	Group A (conventional septoplasty) (n=50)		Group B (endoscopic septoplasty) (n=50)	
	Male	Female	Male	Female
	N (%)	N (%)	N (%)	N (%)
18-20	3 (9.6)	2 (10.5)	6 (18.7)	3 (16.6)
21-30	10 (32.2)	5 (26.3)	12 (37.5)	4 (22.2)
31-40	9 (29)	7 (36.8)	6 (18.7)	4 (22.2)
41-50	4 (12.9)	2 (10.5)	3 (9.3)	3 (16.6)
>50	5 (16.1)	3 (15.7)	5 (15.6)	4 (22.2)
Total	31 (100)	19 (100)	32 (100)	18 (100)
Mean±SD	31.2±5.8	30.6±6.4	29.7±6.7	30.4±7.0

Table 2: Pre-operative diagnostic nasal endoscopy findings and mean nose score among the study subjects.

DNE findings	Group A (conventional septoplasty) (n=50)	Group B (endoscopic septoplasty) (n=50)	P value
	N (%)	N (%)	
Anterior septal deviation	13 (26)	16 (32)	0.715
Posterior septal deviation	26 (52)	24 (48)	0.648
Hypertrophied inferior turbinate	10 (20)	8 (16)	0.517
High septal deviation	9 (18)	10 (20)	0.814
Septal spur	8 (16)	9 (18)	0.824
Mean nose score	55.6±4.12	56.6±5.01	0.818

Table 3: Duration of surgery and stay at hospital among the study subjects between the two groups.

Variable	Group A (conventional septoplasty) (mean±SD)	Group B (endoscopic septoplasty) (mean±SD)	P value
Duration of surgery (in mins)	34.4±5.95	35.6±6.36	0.489
Duration of hospital stay (in days)	2.2±0.77	1.5±0.52	<0.001

Table 4: Post-operative DNE findings and the nose score between the two groups.

DNE findings	Group A (conventional septoplasty) (n=50)	Group B (endoscopic septoplasty) (n=50)	P value
	N (%)	N (%)	
Anterior septal deviation	4 (8)	2 (4)	0.071
Posterior septal deviation	9 (18)	2 (4)	<0.001
Hypertrophied inferior turbinate	2 (4)	1 (2)	0.154
High septal deviation	4 (8)	1 (2)	<0.001
Septal spur	2 (4)	1 (2)	0.154
Mean nose score	12.5±2.3	9.1±1.87	<0.001

Table 5: Post-operative complications occurred between the two groups.

Post-operative complications	Group A (conventional septoplasty) (n=50)	Group B (endoscopic septoplasty) (n=50)	P value
Synechiae	5	1	<0.001
Septal perforation	4	0	<0.001

DISCUSSION

Endoscopic septoplasty is one of the recent advances in the field of ENT. This technique had given surgeon a better visibility of intranasal structures as well as better access to all parts of the septum, especially in the higher and posterior part of septum where it is difficult to visualize with the traditional headlight method. There are no defined parameters for success of septoplasty. Tools like patient satisfaction questionnaires, physical examination, acoustic rhinomanometry, and change in quantity of medications used to relieve nasal obstruction are some of the parameters used to assess the effectiveness of the surgery. Al-Nori et al did a study on effect of septoplasty on squeal of nasal septal deviation to find the effectiveness of septoplasty in improving symptoms of septal deviations and found out about 80.9% of patients had improvement in symptoms of nasal obstruction. They also found that improvements in recurrent sinusitis, chronic pharyngitis, epistaxis and snoring was 55.5%, 28.5%, 80% and 25% respectively.¹³

In our study the mean age of the study subjects was in the range of 30 to 31 years with male:female ratio in both the groups was 1.7:1 and a similar type of results was also shown with many other studies conducted by Al-Shehri, Chung et al and Al-Nori et al.¹³⁻¹⁵ Among the patients the main presenting symptom was nasal obstruction and Jain et al, Singla et al, Al-Shehri also showed a similar patient demography.^{14,16,17} The preoperative diagnostic nasal endoscopy had shown that posterior deviation was more common than anterior deviation and this is consistent with study done by Gupta et al, Chaitanya et al, and Manjunath et al.¹⁸⁻²⁰

We calculated the duration of procedure from infiltration of nasal cavity till the packing of both the nasal cavity. And we compared the duration of surgery in each group. Average time taken for the procedure in conventional

septoplasty group was 34.4 minutes and average time taken for endoscopic septoplasty was 35.6 minutes. Koo et al, in their study reported the intraoperative time during endoscopic septoplasty was 32.48±2.76 minutes.²¹ Paradis et al in their study comparing conventional versus endoscopic septoplasty found that operative time (p<0.001) significantly favoured the endoscopic group.²² However, no such significant difference was found in this study and a study conducted by Khan et al had also quoted a similar finding.²³

The mean hospital stay in both the groups was compared. Conventional septoplasty patients stayed at hospital for 2.2 days and endoscopic septoplasty patients stayed for 1.5 days on an average and the difference was statistically significant. In a study done by Gupta et al there was lesser hospital stay in endoscopic septoplasty group.¹⁸ However in their study the difference was not statistically significant, whereas a study conducted by Yadav et al showed a significant difference in the hospital stay between the two groups quoting it as longer stay in tradition group due to post-operative bleeding, lip edema and hematoma formation while endoscopic group, less chance of such complication.¹¹ The diagnostic nasal endoscopy and the mean NOSE score done post-operatively had shown a statistical significant improvement in the endoscopic septoplasty group than that of the conventional group and the difference was found to be statistically significant. In the study by Jain et al, similar statistically significant difference was found on comparison of conventional septoplasty and endoscopic septoplasty.¹⁶ In another study by Sulligavi et al, the difference was significant similar to our study.²⁴ In our study septal perforation and synechiae were the only two complications encountered and these two complications were found to be more common among the conventional septoplasty group and the difference was found to be statistically significant and our results are in par with the studies done by Rao et al and another study conducted by Kishore et al.^{20,25}

CONCLUSION

The study showed a better surgical outcome with a lesser complications among the endoscopic septoplasty as compared to conventional septoplasty as endoscope gives a better illumination and improved access to high deviated nasal septum and allows limited incision, limited flap elevation and achieves correction with least resection. The only disadvantage of using endoscopic septoplasty was of binocular vision and repeated cleaning of the endoscope.

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REFERENCES

1. Mladina R, Čujić E, Šubarić M, Vuković K. Nasal septal deformities in ear, nose and throat patients: An International Study. *Am J Otolaryngol*. 2008;29(2):75-82.
2. Kawalski H, Spiewak P. How septum deformations in newborn occur. *Int J Pediatr Otorhinolaryngol*. 1998;44(1):23-30.
3. Freer O. The correction of deflections of the nasal septum with a minimum of traumatism. *J Am Med Assoc*. 1902;38:636
4. Killian G. The submucous window resection of the nasal septum. *Ann Otol*. 1905;14:363-7.
5. Cottle MH, Loring RM. Surgery on the nasal septum: New operative procedures and indications. *Ann Otol Rhinol Laryngol*. 1948;57:705.
6. Maran AGD, Lund VJ. Trauma to nose and sinuses. In: 1st Edn.; *Clinical Rhinology*. New York: Thieme, 1990: 110-139.
7. Jain L, Jain M, Chouhan AN, Harshwardhan R. Conventional Septoplasty versus Endoscopic Septoplasty: A Comparative Study. *People's J Sci Res*. 2011;4(2):24-8.
8. Lanza DC, Kennedy DW, Zinreich SJ. Nasal endoscopy and its surgical application. *Essential Otolaryngology; head and neck Surgery*. 5 edn. New York: Medical Examination; 1991: 373-387.
9. Stamberger H. Functional Endoscopic Sinus surgery. Philadelphia B. C. Decker; 1991: 156-159.
10. Cantrell H. Limited septoplasty for endoscopic sinus surgery. *Otolaryngol Head Neck Surg*. 1997;116:274-7.
11. Yadav PK, Agarwal SP, Verma V, Rani P. A study of comparison between the efficacy of endoscopic septoplasty and traditional septoplasty. *Int Surg J*. 2016;3(3):1134-40.
12. Stewart MG, Witsell DL, Smith TL, Weaver EM, Yueh B, Hannley MT. Development and validation of the Nasal Obstruction Symptom Evaluation (NOSE) scale. *Otolaryngol Head Neck Surg*. 2004;130(2):157-63.
13. Haitham Abdul-Malik Al-Nori, Younis S. Mahdi, Ali A. Muttalib Mohammed. The effect of septoplasty on sequelae of nasal septal deviation. *Ann Coll Med Mosul*. 2013;39(1):75-9.
14. Al-Shehri AM, Amin HM, Necklawy A. Retrospective study of endoscopic nasal septoplasty. *Biomed Res*. 2013;24(3):337-40.
15. Chung BJ, Batra PS, Citardi MJ, Lanza DC. Endoscopic septoplasty: revisitation of the technique, indications, and outcomes. *Am J Rhinol*. 2007;21:307-11.
16. Jain L, Jain M, Chouhan AN, Harshwardhan R. Conventional Septoplasty Verses Endoscopic Septoplasty. *People's J Sci Res*. 2011;4(2):24-8.
17. Singla K, Singh B, Bhagat S, Verma BS. Endoscopic septoplasty: prospective study in 50 cases of DNS. *Clin Rhinol An Int J*. 2013;6(2):92-5.
18. Gupta M, Motwani G: Comparative study of endoscopic aided septoplasty and traditional septoplasty in posterior nasal septal deviations. *Indian J Otolaryngol Head Neck Surg*. 2005;57(4):309-11.
19. V. Krishna Chaitanya, N. Janardhan, S. Rajesh Kumar, G. Rakesh. Does the Use of an Endoscope in Conventional Septal Surgery Provide Benefit in Patients of Deviated Nasal Septum, *Sch. J. App. Med. Sci*, 2014;2(5):1824-7.
20. Manjunath Rao SV. Is endoscopic septoplasty really superior than conventional septoplasty?, *National J Otorhinolaryngol Head Neck Surg*. 2013;1(10):16-8.
21. Koo SK, Choi JW, Kim YJ, Kim YJ. Retrospective Analysis Of Endoscopic Septoplasty. *Korean Otorhinolaryngol-Head Neck Surg*. 2012;55(9):559-64.
22. Paradis J, Rotenberg BW. Open Versus Endoscopic Septoplasty: A Single-Blinded, Randomized, Controlled Trial. *J Otolaryngol Head Neck Surg*. 2011;40(Suppl 1):S28-33.
23. Khan MN, Nath K, Uddin S. A clinical study of deviated nasal septum with special reference to conventional and endoscopic septoplasty. *Int J Res Med Sci*. 2016;4(12):5165-71.
24. Suligavi SS, Darde MK, Guttigoli B. Endoscopic Septoplasty; Advantages And Disadvantages; *Clinical Rhinology*. *Int J*. 2010;3(1):27-30.
25. Talluri KK, Motru B, Avvaru K, Babu R, Pradeep J. Correction of Deviated Nasal Septum: Conventional Vs Endoscopic Septoplasty. *IOSR-JDMS*. 2014;13(5):14-5.

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