

How to Cite:

Singh, R., & Majumdar, A. (2022). A comparative study of the outcomes of endoscopic septoplasty with conventional septoplasty. *International Journal of Health Sciences*, 6(S7), 6553-6562.
<https://doi.org/10.53730/ijhs.v6nS7.13744>

A comparative study of the outcomes of endoscopic septoplasty with conventional septoplasty

Dr. Ruchi Singh

Designation- Senior Resident of ENT College- AIIMS PATNA

Email: drruchisingh1991@gmail.com

Dr. A.B Majumdar

Designation: professor Department of Ent College: MGM medical college, kishanganj, bihar

Abstract---Background Deviated nasal septum is common problem in otolaryngorhinological practice. This study was mainly undertaken to compare the advantages and disadvantages of endoscopic septoplasty over conventional septoplasty. Material and methods A prospective study was undertaken in 60 patients attending ENT OPD in a tertiary care centre. The sample was selected by using non-probability convenient sampling technique. Equal number of patients were randomly allocated in to endoscopy and conventional groups by double blinding method. Preoperative nasal obstruction symptom score was noted and intraoperative time was noted in minutes. All the patients received pre medication and operated adhering to strict protocol. The patients were followed at weekly interval for complications and success rates. Results The mean age of the patients was 27 years and majority of the patients were males. Nasal blockage was the common symptom in the study group. The nasal airflow improved to 4 – 5 cm² in patients of both the groups. The mean duration of the surgery was 60.37 minutes in endoscopic group and 54.07 minutes in conventional group. Unilateral mucosal tear was the common intraoperative complication and was seen more in conventional group than the endoscopic group. Nasal blockage and synechia was the main complication in both endoscopic and conventional groups in this study. The endoscopic group had a greater number of patients without any complications compared to conventional group. Conclusion This study concluded that, endoscopic septoplasty is safe, effective and more conservative with better results and had less complications when compared with conventional septoplasty.

Keywords---Deviated nasal septum, Endoscopic septoplasty, Conventional septoplasty, Complications, NOSE score.

Introduction

The nasal septum is a central support structure when deformed, the septum may cause dysfunction and cosmetic deformity, potentially having an impact on many functions of the nasal cavity. Nasal obstruction is the most common complaint in an average rhinologic practice¹ and a deviated nasal septum is the most common cause of nasal obstruction.¹

The evaluation of a septal deviation causing nasal obstruction depends heavily on physical examination. Interestingly, studies have shown that the degree of septal deviation has little correlation with subjective ratings of nasal obstruction. Once a septal deviation is diagnosed, however, medical management targeting the nasal mucosa is typically attempted first with topical nasal steroids, antihistamines, and decongestants as tolerated. If the patient fails medical therapy, a surgical intervention to correct the underlying septal deformity is considered.²

Apart from nasal obstruction, a significantly deviated nasal septum has been implicated in epistaxis, sinusitis, obstructive sleep apnea, and headaches. These conditions are also accepted indications for septoplasty, although some, such as facial pain or headache, may be controversial. Additionally, if the deviated nasal septum impairs access to the middle meatus, it is necessary to perform septoplasty during endoscopic sinus surgery.^{3, 4}

Literature available had shown that, traditional Septoplasty does improve nasal airway, resection rather than conservative surgery is often used. There is often overexposure, unnecessary manipulation of the septal anatomy and more resection.

Majority of these operations are for Deviated Nasal Septum (DNS) which are symptomatic septal deviations are more common in the Caucasians (80%) than in the non-Caucasians.^{5, 6} Surgery is the only option for the obstructive and symptomatic deviated nasal septum. There are various procedures for correction of the Deviated nasal septum, Surgeries include submucosal resection (SMR) of the nasal septum and Septoplasty.

Hwang et al. stated that endoscopic septoplasty is helpful in correction of posterior septal deformities, revision cases and as an effective teaching tool.⁷

Variations in septal and [turbinate](#) anatomy may play a role not only in [nasal obstruction](#), but also in the development of chronic sinus disease. This is believed to be due to both anatomic narrowing of the ostiomeatal complex (OMC) as well to disruption of mucociliary function.⁸

Septal deviation has been associated with significantly longer [mucociliary clearance](#) times than in normal controls. Notably, normalization of mucociliary clearance has been observed after septoplasty.⁹ This study was mainly

undertaken in order to study the advantages of endoscopic septoplasty over conventional septoplasty.

Material and Methods

A prospective study was undertaken in the department of ENT of M.G.M. Medical College & L.S.K. Hospital, Kishanganj, Bihar. Patients of symptomatic DNS undergoing septoplasty under L/A, not responding to conservative medical therapy for 4 weeks, patients with age of more than 13 years were included in to the study.

Revision cases, Septoplasty done along with other nasal surgeries (Endoscopic sinus surgery, septorhinoplasty and turbinate reduction), Septoplasties needing packing intraoperative or postoperative due to bleeding, DNS with columellar dislocation were excluded from the study. The study was approved by ethical committee of the institution. The samples were selected by using Non-probability convenient sampling technique.

Epi- info 2000 Software for population survey was used to calculate the sample size. Confidence level was taken as 95% and confidence interval as 5%. Required sample size was calculated to be 60 (For Conventional Septoplasty: 30 patients and Endoscopic Septoplasty: 30 patients).

Patients with symptomatic DNS were selected. Random allocation for endoscopic or conventional septoplasty was done by double blinding method. Preop nasal obstruction symptom score was noted on the day before surgery using a 5-point grading scale. The questionnaire translated into Hindi/ Bangla language was provided to patients.

Intraoperative time in minutes recorded from time of infiltrating local anaesthetic agent to application of sutures.

Postoperative pain on visual analogue scale was assessed on 1st postoperative day in both the groups. Postoperative nasal obstruction symptom score was evaluated on 4 weeks follow up. Measurement tool for nasal obstruction used was Nasal Obstruction Symptom Evaluation Score (NOSE SCORE) as Not a problem = 0, Very mild problem = 1, Moderate problem = 2, Fairly bad problem = 3, Severe problem = 4. Tool used for pain grading was visual analog scale on the ratings of 1-10. Intraoperative time was recorded in minutes.

Premedication: inj pethidine 1mg/ kg + inj phenargan 0.4mg/ kg body weight was given intra muscularly 30 minutes before surgery. 10 ml modified moffet solution prepared by mixing 1 ml of 1: 100000 adrenaline in 30 ml of 4% xylocaine was instilled in b/ l nasal cavity in proetz position for 10 minutes. Operative field of the patient was cleaned with 10 % povidine iodine solution. Topical decongestant- oxymetazoline was applied. Endoscopic visualization with a 0° endoscope was done. 2% xylocaine with 1:200000 adrenaline was injected submucoperichondrally bilateral area of anticipated flap incision and elevation. Vertical incision was just anterior to deviation was employed for all deviations.

Elevation of the flap was performed endoscopically using Cottle or Freer elevator establishing subperichondrial plane, after the plane established, suction Freer elevator used to complete flap dissection and aspirate blood for optimal endoscopic view. Vertical incision was given at the junction of quadrangular cartilage and perpendicular plate of ethmoid and vomer elevating the flap on opposite side at bony part of septum. Deviated portions of cartilage and bone were excised sharply. Adequacy was assessed by returning the mucosal flaps to the midline and inspecting nasal airway bilaterally and then by palpating areas of residual deviation. Once satisfactory correction was achieved quilting sutures were applied. Packing was not done.

The patients posted for surgery were adequately premedicated using standard procedures. Before surgery operative field of the patient was cleaned with 10 % povidine iodine solution. Topical decongestant- oxymetazoline was applied. 10 ml 2% xylocaine with 1: 200000 adrenaline was infiltrated at caudal end of the septum, floor of nasal cavity, bilateral limen nasi and septum. Freer's incision was given at the caudal end of the septum in the side opposite to the deviation. Mucoperichondrial flap was elevated. Chondrovomerine and chondromaxillary junction were disarticulated. Mucoperiosteal flap was elevated, deviated bony and cartilaginous parts were removed. Criss-cross incision given in the remaining part of quadrilateral cartilage. Quilting sutures were applied.

Adequate post-operative analgesic and antibiotic cover was given to all the patients. The data thus obtained was collected in a predesigned proforma and the data was compiled and analysed using appropriate statistical tests.

Results

Table 1. Age and Sex Distribution of the patients in Endoscopic & Conventional Septoplasty

Age Group	Endoscopic		Conventional		p Value
	Male n (%)	Female n (%)	Male n (%)	Female n (%)	<0.001
14-20	04 (13.3)	02 (6.7)	05 (16.7)	03 (10.0)	
21-30	12 (40.0)	04 (13.3)	09 (30.0)	03 (10.0)	
31-40	04 (13.3)	01 (3.3)	04 (13.3)	02 (6.7)	
>40	02 (6.7)	01 (3.3)	03 (10.0)	01 (3.3)	
Total	22 (73.3)	08 (26.7)	21 (70)	09 (30)	

The mean age of study groups was 27 years and SD value of ± 8.221 . Most common age group involved was 21-30 years with (n=16) involving 26.7% of cases. The least common age group was patients >40 years (n=3) involving 5% of cases. Majority of patients in this study were males 71.7% (n=43) and 28.3% (n=17) were female. This difference was statistically significant.

Table 2. Pre-operative symptoms of the patients in Endoscopic and Conventional Septoplasty

Symptoms	Endoscopic		Conventional	
	No of Patients (n=30)	Percentage (%)	No of Patients (n=30)	Percentage (%)
Nasal Block	12	40.0	14	46.7
Nasal Discharge	08	26.7	06	20.0
Headache	06	20.0	05	16.7
Hyposmia	02	6.7	02	6.7
Bleeding	02	6.7	03	10.0

Nasal blockage was the commonest symptom in both the groups involving (n=12) 40% in Endoscopic group and (n=14) 46.7% in Conventional group. Headache was present in 20% of patients in endoscopic group and 16.7 % of patients in conventional group. Equal no. of patients (n=2) 6.7% were seen in both the groups presenting with Hyposmia. Bleeding was present in 6.7% and 10% patients in endoscopic and conventional group respectively.

Table 3. Pre and post-operative Nasal airflow of the patients in Endoscopic septoplasty

	Nasal airflow (cm²)	Pre-operative		Post-operative	
		No. of Patients	Percentage (%)	No. of Patients	Percentage (%)
Endoscopic septoplasty	0-1	04	13.3	00	0.0
	2-3	16	53.3	04	13.3
	4-5	07	23.3	18	60.0
	6-9	03	10.0	08	26.7
Conventional septoplasty	0-1	05	16.7	00	0.0
	2-3	14	46.7	05	16.7
	4-5	07	23.3	18	60.0
	6-9	04	13.3	07	23.3

In endoscopic septoplasty group, around 53.3% of the cases had nasal airflow between 2 -3 cm² pre-operatively. During the post-operative period around 60.0% of the cases had nasal airflow between 4 – 5 cm². In conventional septoplasty group, about 46.7% of the cases had nasal airflow of 2 – 3 cm² and after operation 60.0% of the cases had airflow between 4 – 5 cm².

Table 4: Duration of surgery in endoscopic and conventional Septoplasty

Duration of surgery	Endoscopic	Conventional	T value	P value, Sig
Mean $\pm$ SD	60.37 $\pm$ 8.9	54.07 $\pm$ 8.56	2.792	0.007, Sig

The mean duration of the surgery was 60.37 minutes in endoscopic septoplasty group and 54.07 minutes in conventional group which was statistically significant between the two groups.

Table 5. Intra-operative complications in endoscopic and conventional Septoplasty

Intra-operative Complication	Endoscopic		Conventional	
	No of Patients	Percentage (%)	No of Patients	Percentage (%)
No complication	18	60.0	08	26.7
Unilateral mucosal tear	07	23.3	12	40.0
Bilateral mucosal tear	05	16.7	10	33.3
Total	30	100	30	100

This study had shown that, unilateral and bilateral mucosal tear as intra operative complication. In endoscopic group we found 7 (23.3%) patients showed unilateral mucosal tear and 5 patients (16.7%) showed bilateral mucosal tear. In conventional group 12 patients (40%) and 10 (33.3%) patients showed unilateral and bilateral mucosal tear respectively. 18 patients (60%) and 8 patients (26.7%) showed no complication during the surgery in endoscopic and conventional group respectively.

Table 6. Post-operative follow-up in endoscopic and conventional Septoplasty at 1st, 2nd, 3rd and 4th week of follow up

	Symptoms	Endoscopic		Conventional	
		No of Patients	Percentage (%)	No of Patients	Percentage (%)
First week of follow up	No complication	16	53.4	08	26.7
	Nasal Blockage	07	23.3	09	30.0
	Infection	01	3.3	05	16.6
	Pain	06	20.0	08	26.7
Second week	No complication	21	70.0	17	56.7

follow up	Nasal Blockage	05	16.7	08	26.6
	Pain	04	13.3	05	16.7
Third week follow up	No complication	24	80.0	20	66.7
	Nasal Blockage	04	13.3	06	20.0
	Pain	02	6.7	04	13.3
Fourth week follow up	No complication	26	86.6	22	73.3
	Nasal Blockage	02	6.7	05	16.7
	Synechia	02	6.7	03	10.0

Maximum number of the patients in Endoscopic groups had no complications. Endoscopic and Conventional group consisted of 23.3% and 30% patients respectively with Nasal Block, 3.3% and 16.6% patients had Infection, and 20% and 26.7% patients had pain/headache during first week follow up.

Nasal block and pain/headache was the commonest symptom in both the groups involving 16.7% in Endoscopic group and 26.6% in Conventional group during 2nd week of post-operative follow-up.

After 3rd week of post-operative follow-up it can be easily interpreted that maximum no of patients i.e. 40% belonged to Endoscopic group showed no complication. Nasal block and pain/headache remained in both the groups.

In the final follow-up maximum number of patients for both the groups showed no complication. But in Endoscopic group the number was much better than that of Conventional group.

Table 7. NOSE Score

Nose Score	Endoscopic		Conventional		p Value
	No of Patients	Percentage (%)	No of Patients	Percentage (%)	
No complication (0)	18	60.0	08	43.2	0.001
Very mild problem (1)	05	16.6	08	43.2	
Moderate Problem (2)	03	10.0	07	23.3	
Fairly bad problem (3)	02	6.7	03	10.0	
Severe problem (4)	02	6.7	04	13.3	
Total	30	100	30	100	

Table no 14 showed Post-operative NOSE score for both endoscopic and conventional group. After evaluating the post-operative NOSE score this study

found that, Endoscopic group consisted maximum number of patients who had no complication.

Discussion

The present study was conducted from November 2016 to August 2018 on 60 patients with nasal complaints having deviated nasal septum who attended the outpatient department of Otorhinolaryngology of M.G.M. Medical College & L.S.K. Hospital, Kishanganj, Bihar.

The present study included 60 cases. Clinical assessment was done in all 60 patients after dividing them into 2 groups out of which 30 underwent endoscopic septoplasty and 30 conventional septoplasties. The mean ($\pm$ SD) age in present study was 27 years ($\pm$ 8.221). Most common age group involved was between 21-30 years in 26.7% of cases. Majority of patients in this study were males. Gulati et al, maximum patients were in the age group of 18 -40 years, 64 % in conventional septoplasty group and 72% in endoscopic group.¹⁰ In another study by Walikar et al in the age group of 10 – 30 years and only 26.6% of patients were above 30 years.¹¹

In this study Nasal blockage was the commonest symptom in both the groups. Headache was present in 20% of patients in endoscopic group and 16.7 % of patients in conventional group. This result is comparable to a study conducted by Nayak et al, where 78.3% of patients had complaint of nasal obstruction, 76.66% of the patients had headache, 45.0% of patients had rhinorrhoea, 58.33% of patients had post nasal discharge.¹² In another study by Aranachlam et al, nasal obstruction was the predominant complaint present in 74% patients.¹³

In this study 33.3% of patients had DNS to left side, 53.3% (n=16) patients had to the right side. Persistent deviated nasal septum was present postoperatively in 4% of the patients in endoscopic group and 16% patients in conventional group. A study conducted by Talluri revealed that around 13.3% had incomplete correction in conventional septoplasty and 6.6% had incomplete correction in endoscopic septoplasty.¹⁴

Similarly, all the patients were relieved of hyposmia after endoscopic septoplasty while the benefit was 87.5% in the conventional group in this study. Similar results were obtained by Park et al, who conducted a comparative study between endoscopic and classical septorhinoplasty on 44 patients where the patient satisfaction and complication percentage were 87.5% and 0% in endoscopic group and, 71.4% and 14.3% in classical septorhinoplasty group.¹⁵

The mean duration of the surgery was little higher in endoscopic septoplasty when compared with conventional septoplasty.

Nasal blockage and pain and headache was the commonest symptom in both the groups. After 3rd week of post-operative follow-up it can be easily interpreted that maximum no of patients belonging to Endoscopic group showed no complication. Nasal blockage and pain remained in both the groups. In the final follow-up most of the patients for both the groups showed no complication. But in Endoscopic

group the number was much more than that of Conventional group. A study by Gupta N et al had shown symptomatic improvement was mainly observed in nasal obstruction in both conventional and endoscopic group, respectively.¹⁶ In another study by Gulati et al, comparison in relief of symptoms at the end of 8 weeks did not show statistically significant difference between two groups. Residual deformity was found to be present in 20% of the patients of conventional group and 8% of patients of endoscopic group. In conventional group, 36% patients developed Synechiae whereas in endoscopic group only 8% patients developed Synechiae which was statistically significant.¹⁷

The evaluation of NOSE scores had shown that, post-operative NOSE score in Endoscopic group consisted maximum number of patients who had no complication.

Conclusion

This study concludes that, Endoscopic Septoplasty is a safe, effective and more conservative approach with better results and less complications as compared to the Conventional Septoplasty. The final result is better patient compliance and a shorter recovery time since trauma and bleeding is much less and it provides greater stability to the nasal pyramid as only the deviated parts of the septum is removed compared to the Conventional Septoplasty using headlight illumination.

References

1. Konstantinidis I, Triaridis A, et al. Long-term results following nasal septal surgery, focus on patient satisfaction. *Auris Nasus Larynx* 2005; 32:369-74.
2. Stewart M, Smith T, Weaver E, et al. Outcomes after nasal septoplasty: results from the Nasal Septoplasty Effectiveness (NOSE) study. *Otolaryngol Head Neck Surg* 2004; 130:283-90.
3. Pletcher S, Sindwani R, Metson R. Endoscopic orbital and optic nerve decompression. *Otolaryngol Clin North Am* Oct 2006; 39 (5): 943-58.
4. Woog JJ, Sindwani R. Endoscopic dacryocystorhinostomy and conjunctivodacryocystorhinostomy. *Otolaryngol Clin North Am* Oct 2006; 39(5):1001-17.
5. Stammberger H, Lund VJ. Anatomy of nose and paranasal sinuses. In Gleeson M. Scott- Brown's Otolaryngology Head and Neck Surgery. 7th edition; vol. II. Great Britain. Edward Arnold (publishers) Ltd; 2008; 1315-1342.
6. Lee J K. The nose and paranasal sinus. Essential Otolaryngology Head and Neck surgery. 8th edition. United States of America: McGraw-Hill medical publishing division; 2003:712.
7. Hwang PH, Mc Laughlin RB, Lanza DC, Kennedy DWI, Endoscopic septoplasty: indications, technique and results *Otolaryngology Head Neck Surg*, 120 (1999), pp. 678-682.
8. Chu CT, Lebowitz RA, Jacobs JB, An analysis of sites of disease in revision endoscopic sinus surgery: *Am J Rhinol*, 11 (1997), pp. 287-291.
9. Ulusoy B, Arbag H, Sari O *et al*. Effect of septoplasty and septal deviation on mucociliary clearance, *Int J Clin Pract*, 2004; 58: 1108-1111.

10. Gulati PS, Wadhera R, Ahuja N, Garg A, Ghai A. Comparative evaluation of endoscopic with conventional septoplasty. *Indian J Otolaryngol Head Neck Surg.* January-March 2009;61(1):9-13.
11. Walikar BN, Rashinkar SM, Watwe MV, Fathima A, Kakkeri A. A comparative study of septoplasty with or without nasal packing. *Indian J Otolaryngol Head Neck Surg.* July-September 2011;63(3):247-48.
12. Nayak DR, Balakrishnan R, Murthy KD, **An endoscopic approach to the deviated nasal septum -a preliminary study** *J Laryngol Otol:* 1998: 112: 10: 934-939.
13. Aranachlam PS, Kitcher E, Gray J. Nasal septal surgery: evaluation of symptomatic and general health outcomes. *Clin Otolaryngol.* 2001;26(5):367-70.
14. Talluri KK, Motru B. Correction of deviated nasal septum:conventional vs endoscopic septoplasty. *J Dental Med Sci.* 2014; 13: 14-5.
15. Park DH, Kim TM, Han DG. Endoscopic –assisted correction of the deviated nose aesthetic. *Plast Surg.* 1988;22(3):190-5.
16. Gupta N. Endoscopic septoplasty. *Indian journal of otolaryngology and head and neck surgery.* July- September 2005;57(3):240-43.
17. Gulati SP, Ahuja N, Garg A, Ghai A. Comparative evaluation of endoscopic with conventional septoplasty. *Indian J Otolaryngol Head Neck Surg.* 2010; 61:32-35.