

Endoscopic septoplasty verses conventional septoplasty in management of deviated nasal septum: a comparative evaluation

Sanjeev Kumar^{1*}, Rajeev Ambastha², R.P.Thakur³

¹Senior Resident, Department of ENT, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India

²Senior Resident, Department of ENT, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India

³Associate Professor and HOD, Department of ENT, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India

Received: 08-10-2020 / Revised: 06-12-2020 / Accepted: 26-12-2020

Abstract

Background: Deviated nasal septum is one of the common causes of nasal obstruction. Correction of deviated nasal septum has been performed by a variety of techniques of which Septoplasty is the most popular one. With the advent of endoscopes and their successful use in endoscopic sinus surgery, endoscopes have been tried in septoplasty for better visualization of posterior part of septum and do the surgery more precisely and with less complication as compare to conventional method. **Aim:** The aim of the study was to study the advantages and disadvantages of endoscopic septoplasty and conventional septoplasty and to co-relate the two procedures in terms of intra-operative visualization, duration of surgery, procedural difficulties, hospital stay and complications. **Material and methods:** The present study done to compare the conventional and endoscopic septoplasty was carried out in the Department of ENT, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India, for 1 year. Total 100 Patients with symptomatic DNS with no other comorbidities and willing for surgical treatment were included. Data was collected by selecting the patients with DNS willing for surgery. They were divided into two groups; one group undergoing conventional septoplasty and the other endoscopic septoplasty by random selection and following up the patients preoperatively and postoperatively. **Results:** Out of 100 patients, 40 were females (40%) and 60 were males (60%). Among 40 females, 20 patients underwent endoscopic and 20 patients underwent conventional septoplasty. Out of 60 males 30 patients underwent endoscopic and 30 patients underwent conventional septoplasty. Mean age was 40.13±11.67. In the present study, major pre-operative symptom was found to be nasal obstruction 88%, followed by headache 54%, postnasal drip 49%, hyposmia 48% and epistaxis 33%. It was observed that the mean time taken for conventional septoplasty was 33.11 minutes standard deviation 6.12 On the other hand endoscopic septoplasty required 25.41 minutes standard deviation 5.62. There was significant subjective improvement among patients of both groups. **Conclusion:** For minimal and posterior deviations of the septum, endoscopic septoplasty is better, whereas for anterior deviations, conventional septoplasty could be better choice.

Keywords: Deviated nasal septum, Conventional septoplasty, Endoscopic septoplasty.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Deviated nasal septum (DNS) is an important and commonest cause for nasal obstruction. The commonest causes of DNS are developmental factors like intrauterine compressions due to cephalo-pelvic disproportion, birth trauma during parturition, later unnoticed trauma during childhood and other injuries of the nose. Deviated nasal septum with nasal obstruction to the airway and with complicating rhinosinusitis and nasal polyposis is a common entity seen in ENT Out Patient Department. Rarely, deviated nasal septum is seen in mass, benign and malignant lesions of the nose like rhinosporidiosis, adenocarcinoma and aesthesioblastoma. DNS with external deformities like deviation of nose, saddle nose, crooked nose and hump of the nose are also added to the list as the cosmetic importance is heightened now a days.[1] Septoplasty was developed

techniques in 1991 to correct septal deformities.[4] Since that time, surgeons have performed concomitant endoscopic septoplasties under varying situations not only to treat symptomatic nasal obstruction but also for improving surgical access to the middle meatus as an adjunct to ESS. The conventional surgeries for septal correction improve nasal airway but do not full fill the above criteria. Various drawbacks regarding conventional surgeries include poor visualization, poor illumination, difficulty in assessing exact pathology, need for nasal packing, and overexposure and over manipulation of the septal framework making revision surgeries difficult.[5] The endoscopic septoplasty is a direct targeted approach to septal anatomic deformity, allowing minimal invasiveness.[6] It allows limited septal flap dissection and removal of a small cartilaginous and/or bony deformity. Better illumination and visualization help to increase the precision of the surgical procedure with limited exposure of the septal flap.[7] It is an adjunct to functional endoscopic sinus surgery[8] and is helpful in the correction of posterior septal deformities[9] and revision cases.[10] Endoscopic surgery is an excellent teaching tool as the entire procedure can be viewed on the monitor.[11]

Material and methods

*Correspondence

Dr. Sanjeev Kumar

Senior Resident, Department of ENT, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India.

E-mail: drskr2004@gmail.com

by Cottle in 1950 as it had advantages of minimal resection of septum and less complications.[2,3] Lanza described endoscopic

The present study done to compare the conventional and endoscopic septoplasty was carried out in the Department of ENT, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India, for 1 year. 100 patients were included in the study.

Inclusion criteria

Patients with symptomatic DNS with no other comorbidities and willing for surgical treatment, were included.

Exclusion criteria

DNS diagnosed patients with allergic rhinitis, upper respiratory tract infections, sinusitis, and other comorbidities and unfit for surgery will be excluded from study.

Methodology

Data was collected by selecting the patients with DNS willing for surgery. They were divided into two groups; one group undergoing conventional septoplasty and the other endoscopic septoplasty by random selection and following up the patients preoperatively and postoperatively. Cases selected for the study were subjected to detailed history and clinical examination. Anterior rhinoscopy and diagnostic nasal endoscopy details were noted. X-ray of paranasal sinuses or CT scan of paranasal sinuses was done. A correlation was established between clinical features and radiological findings. Patients were randomly grouped into two groups of 50 each; one group underwent conventional septoplasty and the other endoscopic septoplasty.

After complete preoperative assessment patients were subjected to surgical intervention. Patients were put on appropriate antibiotics, along with analgesics and decongestants. Nasal pack is removed 24 hours after the surgery. Decongestant nasal drops (3 times daily) is advised for a week.

Patients were discharged and advised to follow up on 1st week, 15th day, 1 and 3 months. At each follow up visit, patients clinical features and symptoms, if present were analysed. Subjective assessment was done by asking about nasal obstruction, headache, nasal discharge, nasal bleed. Objective assessment was done by diagnostic nasal endoscopy. With above findings, the outcomes of surgery were measured.

Results

The study included 100 cases. Out of 100 patients, 40 were females (40%) and 60 were males (60%). Among 40 females, 20 patients underwent endoscopic and 20 patients underwent conventional septoplasty. Out of 60 males, 30 patients underwent endoscopic and 30 patients underwent conventional septoplasty (Table 1). The observations showed that the male patients predominated over their female counterpart. The age of the patients ranged from 15 to 60 years. Minimum and maximum age was 17 and 60 years subsequently with mean age 40.13 years and std. deviation 11.67. The majority of our patients were in their third and fourth decades of life (Table 1).

Table1: Gender incidence and Age distribution among two groups

Groups	Gender		AGE (in years)		
	Male=60	Female=40	15-30	30-45	45-60
Endoscopic septoplasty	30	20	16	22	12
Conventional septoplasty	30	20	6	27	17

Table 2: Pre-operative symptoms among two groups

Symptoms	Endoscopic septoplasty group n=50		Conventional septoplasty group n=50		Total	%
Nasal obstruction	42	84%	46	96%	88	88
Headache	26	52%	28	58%	54	54
Postnasal drip	24	48%	25	50%	49	49
Hyposmia	26	52%	22	44%	48	48
Epistaxis	14	28%	19	38%	33	33

In the present study, major pre-operative symptom was found to be nasal obstruction 88%, followed by headache 54%, postnasal drip 49%, hyposmia 48% and epistaxis 33% (Table 2). It was observed that the mean time taken for conventional septoplasty was 33.11 minutes standard deviation 6.12 On the other hand endoscopic septoplasty required 25.41 minutes standard deviation 5.62 (Table 3). Difference between two groups was not statistically too much significant. Intra operative blood loss: Average blood loss (in ml) in the conventional septoplasty (CS) was 88.61 (standard deviation 22.34) while that of endoscopic septoplasty (ES) group was 54.22 (standard deviation 12.06) (Table 3). Blood loss was more in CS group.

Table 3: Duration and volume of blood loss during surgery

Parameter	Endoscopic septoplasty		Conventional septoplasty	
	Mean	Std deviation	Mean	Std. deviation
Duration of surgery (minute)	25.41	5.62	33.11	6.12
Volume of blood loss (ml)	54.22	12.06	88.61	22.34

The Post-operative result was analysed by dividing then into subjective & objective assessment at the end of 90th day. There was significant subjective improvement among patients of both groups. It was noticed that improvement of nasal obstruction was (92.86%), headache (84.62%), postnasal drip (75%), hyposmia (88.46%) and epistaxis (78.57%) in endoscopic septoplasty (ES) group. On the other hand in conventional septoplasty group improvement of nasal obstruction (60.87%), headache (53.57%), post nasal drip (PND) (32%) hyposmia (63.64%) and epistaxis (63.16%) was seen (Table 4). This difference in relief of symptom was found to be very significant.

Table 4: Comparison of relief in symptoms in both groups at the end of 90th day

Symptoms	Endoscopic group	Conventional group
Nasal obstruction	39/42 (92.86%)	28/46 (60.87%)
Headache	22/26 (84.62%)	15/28 (53.57%)
Postnasal drip	18/24 (75%)	8/25 (32%)
Hyposmia	23/26(88.46%)	14/22 (63.64%)
Epistaxis	11/14 (78.57%)	12/19 (63.16%)

On 90th day of follow-up visit, residual deviation was found to be present in 19 (38%) of patients of conventional groups whereas it was present in 3 (6%) patients of endoscopic group (P=0.005).

In conventional group, 18 (36%) patients developed synechiae whereas in endoscopic group 6(12%) patients developed synechiae (P=0.027). It was statistically significant (Table 5).

Table 5: Objective assessment in both groups at the end of 90 th day

Parameter	Endoscopic group(n=50)	Conventional group(n=50)	P value
Persistence of deviation	3 (6%)	19 (38%)	0.005
Persistence of spur	2 (4%)	8 (16%)	0.179
Formation of synechiae	6 (12%)	18 (36%)	0.027
Septal perforation	0 (0%)	3(6%)	0.469

With the introduction of endoscopes into other branches of surgery, there have been attempts at its utilization in septal surgery. Endoscopic septoplasty is an attractive alternative to traditional headlight septoplasty. It is a conservative and precise approach toward deviated nasal septum correction and provides easy and accurate access in correcting the deviated part of the septum without causing much complication. The current study was conducted to compare the outcomes of endoscopic and conventional septoplasty among patients. To obtain accurate results, 100 patients were included in the study and divided into two equal groups (endoscopic septoplasty group and conventional septoplasty group) by computer-generated random sampling. As per the available literature neither the incidence of symptomatic DNS nor the outcome of surgery has any difference in male and female. Mohammad et al conducted a descriptive study on 200 patients to assess the complications of septoplasty and submucosal resection of septum, in which 162 patients (81%) were males and 38 patients (19%) were females with a ratio of 4.26:1.[12] In many other studies, male patients were more common than female patients. This can be attributed to more exposure to trauma in males or random assignment of patients. Similar to the existing literature, in our study also had more male (60%) patients compared to female (40%) patients with symptomatic DNS. Outcome of surgery did not have any difference on gender.

The age of the patients ranged from 15 to 60 years. Minimum and maximum age was 17 and 60 years subsequently with mean age 40.13 years and std. deviation 11.67. The majority of our patients were in their third and fourth decades of life. Jain et al. and Rao et al.[13,14] also concluded in their study that the most common age groups involved were in the second and third decades of life.

In the present study, major pre-operative symptom was found to be nasal obstruction 88%, followed by headache 54%, postnasal drip 49%, hyposmia 48% and epistaxis 33%. The present findings were quite similar to observation of Nayak DR et al. [15] where 78.3% patients had complaint of nasal obstruction. Headache was present in 76.66%, rhinorrhoea in 45%, PND in 58.33% and hyposmia in 8.33%. In another study conducted by Gulati et al [16] nasal obstruction was complained by 92% patients, headache by 58% patients, catarrh in 50 % patients and post-nasal discharge in 30%.

It was observed that the mean time taken for conventional septoplasty was 33.11 minutes standard deviation 6.12. On the other hand endoscopic septoplasty required 25.41 minutes standard deviation 5.62. A similar experience was obtained by Aiyer[17] who stated that majority of patient (82%) who underwent endoscopic septoplasty had minimal (<50ml) blood loss as compared to 45% in conventional septoplasty group.

The post-operative result was analysed by dividing them into subjective & objective assessment at the end of 90th day. There was significant subjective improvement among patients of both groups. It was noticed that improvement of nasal obstruction was (92.86%), headache (84.62%), postnasal drip (75%) hyposmia (88.46%) and epistaxis (78.57%) in endoscopic septoplasty (ES) group. On the other hand in conventional septoplasty group improvement of nasal obstruction (60.87%), headache (53.57%), post nasal drip (PND) (32%) hyposmia (63.64%) epistaxis (63.16%) was seen. This difference in relief of symptom was found to be very significant.

Our observations were in consensus with other similar studies. In a study by Harley et al.[18] patients with nasal obstruction and headache were selected and significant improvement are observed in endoscopic group as compared to conventional septoplasty group. Gulati et al.[16] in their comparative study enrolling 50 cases stated that 90.5% cases reported improvement of their obstruction by the endoscopic method while 80% cases of conventional got relief. This is also in favour of our findings. In a study by Sindhvani & Wright[19], 54% patients with complaints of nasal obstruction and facial pain were cured and 38% showed improvement and 8% patients were not benefitted. In a study by Harley et al.[18] patients with nasal obstruction and headache were selected and significant improvement was observed in endoscopic group as compared to conventional group. These findings are quite similar to ours. Park et al[1] conducted a study on 44 patients to compare the endoscopic-assisted correction of deviated nose with that of classical septorhinoplasty. Of the 44 patients, 16 underwent endoscopic-assisted septoplasty and the rest underwent classical septorhinoplasty. The patients' satisfaction was 87.5 and 71.4%, and complications were 0 and 14.3% for endoscopic and classical approaches respectively. In the present study, ES group of patients showed statistically significant improvement in correction of septal deviation and spur in comparison to CS group. On 90th day of follow-up visit, residual deviation was found to be present in 19 (38%) of patient of conventional groups whereas it was present in 3 (6%) patient of endoscopic group (P=0.005). This result is at par with the results of Nayak et al.[15] They showed that only 10% patients of anterior deviation had persistent septal deformity and posterior deviations/spurs were effectively corrected in most of the cases in endoscopic septoplasty group. They also observed that endoscopic septoplasty was found to be more effective in treating symptoms such as nasal obstruction and headache which is similar to the present results. In the study by Park et al.[1] the synechiae were formed in significant lower number of patients in ES group as compared to the CS group. This is in concordance with the current study.

In the present study, in conventional group, 18 (36%) patients developed synechiae whereas in endoscopic group 6(12%) patients developed synechiae (P=0.027). It was statistically significant. This is quite similar to the result of Prakash et al.[20] where statistically significant higher incidence of complication was observed in the conventional group (35%) as compare to the endoscopic group (15%). This result was partly similar to the study of Gupta et al.[21] , Jain et al.[13] and Talluri et al.[22]

Conclusion

From the present study we may conclude that endoscopic septoplasty is a better option for treating patients with posterior septal deviations as it provides good visualization of the surgical field. This procedure drastically reduces the operating time as compared to the conventional septoplasty. Hence reduced hospital stay and reduced post-operative complications. It also has less intra-operative bleeding and mucosal tear complications, reduces the duration of wound healing as there is minimal tissue handling. But endoscopic septoplasty also has got its own drawback which includes learning curve, adjustment towards single handed surgery. The drawbacks of

conventional septoplasty were difficulty in removal of posterior deviation, and that is due to poor illumination. However, it is beneficial for correction of the anterior DNS, doesn't need T.V. monitor, endoscopic camera and other equipment. Hence, we can also conclude that for minimal and posterior deviations, endoscopic septoplasty is better whereas for anterior deviation, conventional septoplasty is better.

References

1. Park DH, Kim TM, Han DG, et al. Endoscopic-assisted correction of deviated nose. *Aesthetic Plast Surg* 1998;22(3):190-195.
2. Cottle MH, Fisher GG, Gaynon IE. The maxilla premaxilla approach to extensive nasal septum surgery. *Arch Otolaryngol.* 1958;68:301.
3. Singh A. A comparative study of conventional vs endoscopic septoplasty. *Bengal J Otolaryngol Head Neck Surg.* 2018;26(1):1-9.
4. Lanza DC, Kennedy DW, Zinreich SJ. Nasal endoscopic and its Surgical applications. In: Lee KJ. *Essential Otolaryngology: head and neck surgery.* 5th Edn. Appleton & Lange; 1991: 373-387.
5. Garzaro M, Dell'Era V, Riva G, Raimondo L, Pecorari G, Aluffi Valletti P. Endoscopic versus conventional septoplasty: Objective/subjective data on 276 patients. *Eur Arch Otorhinolaryngol* 2019;276:1707-11.
6. Ranjan GA, Rahul G, Jayman R. Endoscopic septoplasty: A novel technique-A case series of 19 cases. *Clin Rhinol* 2009;2:11-3.
7. Bothra R, Mathur NN. Comparative evaluation of conventional versus endoscopic septoplasty for limited septal deviation and spur. *J Laryngol Otol* 2009;123:737-41.
8. Sathyaki DC, Geetha C, Munishwara GB, Mohan M, Manjuanth K. A comparative study of endoscopic septoplasty versus conventional septoplasty. *Indian J Otolaryngol Head Neck Surg* 2014;66:155-61.
9. Giles WC, Gross CW, Abram AC, Greene WM, Avner TG. Endoscopic septoplasty. *Laryngoscope* 1994;104:1507-9.
10. Getz AE, Hwang PH. Endoscopic septoplasty. *Curr Opin Otolaryngol Head Neck Surg* 2008;16:26-31.
11. Chung BJ, Batra PS, Citardi MJ, Lanza DC. Endoscopic septoplasty: Revisitation of the technique, indications, and outcomes. *Am J Rhinol* 2007;21:307-11.
12. Muhammad IA, Rahman NU. Complications of the surgery for deviated nasal septum: *J Coll Physicians Surgery Pak.* 2003;13(10):565-8.
13. Jain L, Jain M, Chauhan AN, Harshwardan R. Conventional septoplasty versus endoscopic septoplasty: A comparative study. *People's J Sci Res* 2011;4:24-8.
14. Rao JJ, Kumar EC, Babu KR, Chowdary VS, Singh J, Rangamani SV. Classification of nasal septal deviations in relation to sinonasal pathology. *Indian J Otolaryngol Head Neck Surg* 2005;57:199-201
15. Nayak DR, Balakrishnan R, Murthy KD, Hazarika P. Endoscopic Septoturboplasty- our update series. *Indian J Otolaryngol Head Neck Surg.* 2002;54(1)20-24.
16. Gulati SP, Raman W, Neetika A, Ajay G. Comparative evaluation of endoscopic with conventional septoplasty. *Indian J Otolaryngol Head Neck Surg.* 2009;61(1)27-29.
17. Aiyer RG, Raval JB. Comparative Study Between Endoscopic Septoplasty and Conventional Septoplasty. *World Articles in Ear, Nose and Throat.* 2010;3:1.
18. Harley DH, Powitzky ES, Duncavage J. Clinical outcomes for the surgical treatment of sinonasal headache. *Otolaryngol Head Neck Surg.* 2003;129(3)217-221.
19. Sindhvani R, Wright DE. Role of endoscopic septoplasty in the treatment of atypical facial pain. *J Otolaryngol.* 2003;32(2)77-79.
20. Prakash NS, George NM. Endoscopic boon from the Conventional Septoplasty trends. *Nat J Otorhinolaryngol Head Neck Surg.* 2014;2(2)22- 24.
21. Gupta M, Motwani G. Comparative study of endoscopic aided septoplasty and traditional septoplasty in posterior nasal septal deviation. *Indian J Otolaryngol Head Neck Surg.* 2005;57(4)309-311.
22. Talluri KK, Motru B, Avvaru K, Babu GR, Pradeep JK. Correction of Deviated Nasal Septum- Conventional VS Endoscopic Septoplasty. *IOSR J Dent Med Sci.* 2014;13(5)14-15.

Conflict of Interest: Nil

Source of support: Nil