

Original Research Article

A comparative study of endoscopic septoplasty and conventional septoplasty

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ABSTRACT

Background: 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.

Methods: It is a prospective study done during November 2017 to April 2019 on 50 patients with symptomatic deviated nasal septum. Patients were randomly divided into conventional septoplasty and endoscopic septoplasty groups of 25 each. Surgery was performed as according to the division. Followed up on 1st week, 15th day, 1st month and 3rd month.

Results: In endoscopic septoplasty group, septal pathology, precise correction of the pathology, with less complications were seen. Hospital stay and duration of surgery were significantly less in endoscopic group.

Conclusions: 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

INTRODUCTION

Nasal obstruction is the most common complaint in rhinologic practice and a deviated nasal septum (DNS) is the most common cause of nasal obstruction. At birth, nasal septum is usually straight and remains straight in the childhood. As age progresses, the septum has a tendency to bend on one or the other side.¹ A significantly DNS has been implicated in epistaxis, sinusitis, obstructive sleep apnea and headache attributable to contact points with structures of the lateral nasal wall. Thus surgical correction of the DNS came into existence.²

Septoplasty was developed by Cottle in 1950 as it had advantages of minimal resection of septum and less complications.^{3,4} Lanza described endoscopic techniques

in 1991 to correct septal deformities.⁵ 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.

Hence the present study was taken up to compare the two techniques i.e. conventional and endoscopic septoplasty.

METHODS

The present study was done to compare the conventional and endoscopic septoplasty was carried out in the Department of Otorhinolaryngology, Basaveshwara Teaching and General Hospital from November 2017 to April 2019. 50 patients were included in the study.

Inclusion criteria

Patients with symptomatic DNS with no other co-morbidities and willing for surgical treatment were included.

Exclusion criteria

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

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 were done. A correlation was established between clinical features and radiological findings. Patients were randomly grouped into two groups of 25 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.

Statistical analysis

The data is analysed by using SPSS 20.0 version software. For qualitative analysis Chi-square test is applied. For quantitative data T-test and ANOVA is applied for significance. If $p < 0.05$, is considered as significant.

RESULTS

There were totally 50 patients included in the study.

Study observes that, maximum number of cases i.e., 23 (46.0%) were belonged to the age group of 21 to 30 years, followed by 12 (24.0%) and 9 (18.0%) were belonged to the age groups of 11 to 20 and 31 to 40 years respectively. Youngest age was 12 years old and oldest age was 60 years old. The mean age of group I (conventional septoplasty) was 28.24 ± 12.07 and group II (endoscopic septoplasty) was 28.48 ± 9.28 .

There was no statistically significant difference of age between the group I and II ($p > 0.05$).

Table 1: Age wise distribution of cases.

Age in years	Type of septoplasty				Total	
	Group I		Group II		N	%
	N	%	N	%		
11-20	6	24.0	6	24.0	12	24.0
21-30	13	52.0	10	40.0	23	46.0
31-40	3	12.0	6	24.0	9	18.0
>40	3	12.0	3	12.0	6	12.0
Total	25	100.0	25	100.0	50	100.0
Mean±SD	28.24±12.07		28.48±9.28		28.30±10.52	
t-test value, p value	t=0.079, P=0.938 NS					

NS=not significant, S=significant, HS=highly significant, VHS=very highly significant.

Study observes that, intra-operative visualization was good in 22 (88.0%) number of patients in group II and 16 (64.0%) patients in group I, and in group I, 9 (36.0%) cases had poor visualization due to non-visibility of the posterior part of the septum, hypertrophy of the inferior turbinate, middle turbinate, and due to poor illumination and in group II, 3 (12.0%) cases had poor visualization

due to excessive intra-operative bleeding, fogging of the scope. There was statistically significant difference of the intra-operative visualization of the surgical field between the groups I and II ($p < 0.05$).

In the group II cases visualization was significantly good compared to cases in group I.

Table 2: Comparison of intra-operative visualization between the groups I and II.

Visualization	Type of septoplasty				Total	
	Group I		Group II		N	%
	N	%	N	%		
Good	16	64.0	22	88.0	38	76.0
Poor	9	36.0	3	12.0	12	24.0
Total	25	100.0	25	100.0	50	100.0
Chi-square test, p value	$\chi^2=3.94, p=0.045, S$					

NS=not significant, S=significant, HS=highly significant, VHS=very highly significant.

Table 3: Comparison of intra-operative procedural difficulties between the groups I and II.

Difficulties	Type of septoplasty				Total	
	Group I		Group II		N	%
	N	%	N	%		
No difficulty	14	56.0	21	84.0	35	70.0
Spur removal	6	24.0	4	16.0	11	22.0
Flap elevation	4	16.0	0	0.0	4	8.0
Removal of post deviation	1	4.0	0	0.0	9	18.0
Chi-Square test, p value	$\chi^2=3.87, p=0.05, S$					

NS=not significant, S=significant, HS=highly significant, VHS=very highly significant.

Table 4: Comparison of duration of surgery between the groups I and II.

Duration in minutes	Type of septoplasty				Total	
	Group I		Group II		No.	%
	N	%	N	%		
21-30	2	12.0	10	40.0	12	24.0
31-40	14	52.0	11	36.0	25	50.0
41-50	9	36.0	4	24.0	13	26.0
Total	25	100.0	25	100.0	50	100.0
Mean±SD	39.20±5.81		34.08±6.72		37.56±6.25	
t-test value, p value	t = 2.880, p=0.006 HS					

NS= not significant, S=significant, HS=highly significant, VHS=very highly significant.

Study observes that, intra-operatively, there was no difficulty noted in 21 (84.0%) cases in group II and 14 (56.0%) cases in the group I, and there was statistically significant difference of intra-operative difficulties between the groups I and II (p<0.05)

In the group II cases intra-operative difficulties were significantly less as compared to group I.

The mean duration in group I was 39.20±5.81 and in group II was 34.08±6.72.

In group I, more number of cases had longer duration of surgery i.e., 9 (36.0%) cases due to difficulty in removal of posterior deviations and spur and in group II, duration of surgery was prolonged in 4 (24.0%) cases due to excessive intra-operative bleeding, fogging of the scope.

There was statistically highly significant difference in duration of surgery between the groups I and II (p<0.01). In the group II had significantly less duration of surgery as compared to group I.

The mean hospital stay in group I was 1.68±0.41 and in group II was 1.41±0.49.

In group I, 8 (32.0%) cases stayed in hospital for 1 day and 17 (68.0%) cases stayed in hospital for 2 days. And in group II, 17 (68.0%) cases stayed in hospital for 1day and 8 (32.0%) cases stayed in hospital for 2 days.

There was statistically highly significant difference of hospital stay between the groups I and II (p<0.01). In the group II the mean hospital stay was significantly less as compare to group I.

There was statistically significant difference in post-operative DNE among the groups I and II (p<0.05).

On post-operative diagnostic nasal endoscopic examination, all cases of group II had straight septum. In group I, 21 (84.0%) cases had straight septum and 4 (16.0%) cases had persistent right sided DNS. There were no cases of left sided persistent DNS.

Table 5: Comparison of hospital stays between the groups I and II.

Hospital stay in days	Type of septoplasty				Total	
	Group I		Group II		No.	%
	No.	%	No.	%		
1 day	8	32.0	17	68.0	25	50.0
2 days	17	68.0	8	32.0	25	50.0
Total	25	100.0	25	100.0	50	100.0
Mean±SD	1.68±0.41		1.41±0.49		1.54±0.44	
t-test value, p value	t=6.48, p=0.008 HS					

NS= not significant, S=significant, HS=highly significant, VHS=very highly significant.

Table 6: Comparison of post-operative DNE between the groups I and II.

DNE	Side	Types of septoplasty				Chi-square test, p value
		Group I		Group II		
		No.	%	No.	%	
Septum	Right side	4	16.0	0	0.0	$\chi^2_{\text{yates}} = 4.37, p=0.045$
	Straight	21	84.0	25	100.0	

DISCUSSION

The present study was conducted from 1st November 2017 to 30th April 2019 and 50 patients were included in the study with symptomatic DNS attending the otorhinolaryngology department of Basaveshwara Teaching and General Hospital.

The results of 25 cases of conventional septoplasty and 25 cases of endoscopic septoplasty were assessed under the following headings

Age distribution

Some of the earliest work was undertaken by Hayton, who used the Killian’s operations and ended up with external deformities in significant number of children indicating that, septal surgery performed during childhood carries with it the external deformities directly due to surgery and an additional problem of interference with subsequent growth of the nose.⁶ This view has been challenged by Cottle et al.³ Amongst the adults, the age does not have any influence on the septal surgery.

In the present study of 50 patients, the age varied between 12 years and 60 years. In the group who underwent conventional septoplasty, 6 patients were (24.00%) in the age group of 11 to 20 years, 13 patients (52.00%) were in the age group of 21 to 30 years, 3 patients (12.00%) were in the age group of 31 to 40 years, 3 patients (12.00%) were above 40 years. Amongst the endoscopic septoplasty group, 6 patients (24.00%) were in the age group of 11 to 20 years, 10 patients (40.00%) were in the age group of 21 to 30 years, 6 patients (24.00%) were in the age group of 31 to 40 years, 3 patients (12.00%) were above 40 years. Youngest was 12 year old and oldest was 60 year old. Maximum number of patients were in the 3rd decade of

life. The mean age group of the patients in conventional septoplasty group was 28.24±12.07 years and in endoscopic septoplasty group was 28.48±9.28 years with an overall mean age of 28.30±10.52 years. None of the patients had post-operative external deformities. Thus, the results of our study were similar to the other studies.

Sex distribution

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 4.26:1.⁷ 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 patients compared to female patients and symptomatic DNS, outcome of surgery did not had any difference on gender.

Anterior rhinoscopic and nasal endoscopic findings

All the patients underwent anterior rhinoscopy and diagnostic nasal endoscopic examination in our study. In a prospective study of the efficacy of endoscope aided septoturboplasty on 480 patients by Nayak et al, anterior deviation of the septum was seen in 427 patients and posterior deviation was seen in 154 patients.⁸ Spur was seen in 176 patients and hypertrophied inferior turbinates were seen in 372 patients.

In the current study, DNS was seen in all the 50 patients, maximum number of cases i.e., 38 (76.0%) cases had right and left sided anterior septal deviation out of which conventional group had 16 (64.0%) cases and endoscopic group had 22 (88.0%) cases. And 9 (18.0%) cases had right sided posterior septal deviation, 3 (12.0%) cases had left sided posterior septal deviation. 12 (24.0%) cases had spur on the right side and 6 (12.0%) cases had spur on the left side. These findings were similar to other previous studies.

Intra operative assessment

Visualization: The traditional approach to septoplasty involves headlight illumination, visualization through a nasal speculum, and surgical instruments that are typically disparate from that used during standard endoscopic procedures. These circumstances can be suboptimal when treating a narrow nose, approaching posterior deviation, or required frequent exchanges between headlight and endoscope. In addition, impaired visualization may predispose to nasal mucosal trauma, which can compromise endoscopic visualization during sinus surgery.

A study by Durr et al performed endoscopic septoplasty on 47 patients and showed that endoscopic approach provides a direct-targeted route to the anatomic deformity, improved visualization, and magnification of the surgical field.⁹ It allows improved evaluation of the posterior nasal septal deformities, identification of the degree of mucosal involvement of the posterior ends of the inferior turbinates, and concomitant assessment of the middle meatus.

In our study, visualization was good in 22 (88.0%) number of patients in endoscopic group and 16 (64.0%) in conventional group which was statistically significant ($p < 0.05$). In conventional group, 9 (36.0%) cases had poor visualization due to non-visibility of the posterior part of the septum, hypertrophy of the inferior turbinate, middle turbinate, and due to poor illumination and in endoscopic group also, 3 (12.0%) cases had poor visualization due to excessive intra-operative bleeding, fogging of the scope. This result was similar to the other existing literatures.

Duration of surgery: In a study by Champagne et al showed that endoscopy reduces operating time in septoplasty.¹⁰ Operating time is classically used as primary assessment criterion, as it corresponds to the technical ease with which a procedure is performed along the learning curve. Paradis and Rotenberg reported a significant 28 minutes time saving with endoscopy.¹⁰

In our study, the mean duration in conventional group was 39.20 ± 5.81 and in endoscopic group was 34.08 ± 6.72 . In conventional septoplasty group, more number of cases had longer duration of surgery due to difficulty in removal of posterior deviations and spur and

in endoscopic septoplasty group also, duration of surgery was prolonged due to excessive intraoperative bleeding, fogging of the scope. But overall, endoscopic septoplasty group, had significantly lesser duration of surgery as compared to conventional septoplasty group as suggested by previous studies.

Postoperative evaluation: Park et al conducted a study to compare the endoscope assisted correction of deviated nose to classical septorhinoplasty on 44 patients of which 16 patients underwent endoscope assisted septoplasty and 28 patients underwent classical method.¹¹ The patients satisfaction was 87.5% and 71.4% and complications were 0% and 14.3%. in endoscope assisted correction of deviated nose and classical septorhinoplasty respectively.

In a study by Sathyaki et al, out of 50 patients with nasal obstruction, 46 of the 50 patients were relieved of the symptom of which 22 of the 25 patients belonged to conventional and 24 of the 25 patients belonged to endoscopic septoplasty group.¹² Headache persisted in 2 of the 10 patients in conventional septoplasty group. None of the patients in the endoscopic septoplasty group complained of headache. Epistaxis was relieved in patients belonging to conventional septoplasty group. There was significant improvement in symptoms in both the groups when compared with preoperative symptomatology.

In the present study, on post-operative follow up, in the endoscopic septoplasty group, there were less number of patients complaining of nasal obstruction (1 patient), and no cases of headache and epistaxis except pain (4 patients) as compared to conventional septoplasty group, where 4 patients had nasal obstruction, 2 patients had headache, 2 patients had pain in the nose and 1 patient had one episode of epistaxis. This was similar to other previous studies.

Hospital stay: The study by Gupta et al both study showed that patients with traditional septoplasty required longer duration of hospital stay due to bleeding, lip odema.¹³

In the present study, conventional septoplasty group required longer duration of hospital stay as compared to endoscopic septoplasty group which was highly significant. This is in agreement with the other literatures.

Complications: In a study conducted by Bothra et al, minor complications like haemorrhage, infra orbital oedema and nasal pain were more in patients who underwent conventional septoplasty.¹⁴ Synechiae persisted in 2 patients of each group.

In a study by Sathyaki et al, 6 patients in conventional septoplasty group had intraoperative haemorrhage and only 2 patients in the endoscopic septoplasty group had this.¹² Mucosal tear occurred in 6 patients belonging to conventional septoplasty group and 3 patients belonging to endoscopic septoplasty group. 4 patients belonging to

conventional septoplasty group reported with synechae formation. There was delayed healing at incision site in 3 patients belonging to endoscopic septoplasty group as the wound was not sutured. There were no external deformities in patients belonging to either of the groups.

In the present study, there were less number of postoperative complications seen in endoscopic group i.e., 1 (4.0%) cases and in the conventional group, 4 (16.0%) cases who had synechia. One patient in conventional group had septal perforation. Intra-operatively, there were more number of cases of excessive bleeding and mucosal tear i.e., 3 and 5 cases respectively in conventional group when compared to endoscopic group where 2 cases had intra-operative excessive bleeding and 2 cases had mucosal tear. This was similar to other previous studies.

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 drawbacks which includes learning curve, adjustment towards single handed surgery. And drawbacks of conventional septoplasty were difficulty in removal of posterior deviation, and due to poor illumination. However, it is beneficial for correction of the anteriorly 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 corrections, conventional septoplasty is better.

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