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Original Research Article

A clinical study of deviated nasal septum with special reference to conventional and endoscopic septoplasty

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ABSTRACT

Background: Deviated nasal septum is a very common condition. It causes nasal obstruction, epistaxis, sinusitis, headache and obstructive sleep apnea. Septoplasty is one of the most common procedures performed for correction of deviated nasal septum. The aim of our study was to determine the incidence of DNS with respect to age, sex, type of septal deviation and presenting complaints and compare if endoscopic septoplasty is better than conventional septoplasty.
Methods: The present study was conducted among 115 cases of DNS for a period of one year. While detailed clinical study was done in 115 cases, surgery was performed in 60 cases. They were divided into group A and group B with 30 cases in each group. Conventional septoplasty was performed in group A while endoscopic septoplasty in group B.
Results: The male to female ratio was found to be 2.19:1. Majority (37.18%) patients were of age group 11-20 years with deviation to the left (54.78%). Nasal obstruction (58.26%) was the commonest presenting complaint. Postoperatively, a significant relief of symptoms were observed in endoscopic septoplasty in terms of nasal obstruction (93.33%) and hyposmia (87.5%). Post-operative complications were higher in conventional septoplasty with significant rate of residual deviation.
Conclusions: Our study showed that functional outcome was better and post-operative complications were less in endoscopic septoplasty. Endoscopic septoplasty provides better illumination which helps to identify septal deviation accurately while reducing the postoperative complications due to limited dissection and lesser trauma to septal cartilage.

Keywords: Conventional septoplasty, Deviated nasal septum, Endoscopic septoplasty

INTRODUCTION

Beauty of the face is related to the balance and symmetry of different parts of the face which includes the nose. The face loses its beauty if the balanced nose is not in harmony with the other components of the face.[1] Deviated nasal septum (DNS) is a rule rather than an exception and is considered to arise out of consequence of trauma either during intra-uterine life or thereafter.[2]

Though majority of human beings have deviated nasal septum, most of them are asymptomatic and cause little if any discomfort. However, deviated nasal septum may cause nasal obstruction and predispose to various inter-related ailments like sinusitis, epistaxis, dysfunction of the Eustachian tube, otitis media, and respiratory tract infections both upper and lower, dental mal-alignments and in turn poor general health.[3] Deviation of the septum was classified by Cottle into four different groups: subluxation, large spurs, caudal deflection and tension septum.[4] Septoplasty is one of the surgical procedures for the correction of a deviated nasal septum. First described by Cottle in 1947, conventional septoplasty is a conservative surgery in which only the deviated part is removed leaving behind as much cartilage and bone as possible.[5] Conventional septoplasty has increased

morbidity due to poor visualization, relative inaccessibility, poor illumination, difficulty in evaluation of the exact pathology, need for nasal packing, unnecessary manipulation, resection and overexposure of the septal framework reducing the scope for a revision surgery.[6] It was in 1991 Lanza et al and Stammberger described endoscopic correction of septal deformity.[7,8]

Endoscopic septoplasty is a minimally invasive technique that helps us to correct the deformity of the septum under direct visualization using an endoscope.[8] The overall functional improvement is judged on the basis of relief of pre-operative signs and symptoms, post-operative cosmetic improvement. However, there is a relative paucity of literature in this regard.

The aim of this study was to find out the incidence of deviated nasal septum with respect to age, sex and presenting complaints, and to compare the effectiveness of endoscopic septoplasty and conventional septoplasty in terms of correction of deviation of septum, operative time taken and post-operative morbidity.

METHODS

A total of 581 cases, attended the Department of Otorhinolaryngology, Silchar Medical College & Hospital, Silchar with nasal complaints during the study period. Of these, 115 cases of were diagnosed with deviated nasal septum. The present study was a prospective study conducted for a period of 12 months between June 2014 to May 2015. While a detailed clinical study was done in all these cases, surgical management was done in 60 cases. They were divided into group A and group B with 30 cases in each group. Conventional septoplasty was performed in group A while endoscopic septoplasty was performed in group B. A comparison was drawn between the two procedures with regard to intra-operative time, post-operative complications and relief of symptoms. The patients were called for first follow up on fifteenth post-operative day. Thereafter follow up was done after three months and six months of the surgery respectively. Patients were assessed for subjective improvement of symptoms i.e nasal obstruction, nasal discharge, headache, bleeding per nose and hyposmia. Nasal endoscopy was done for objective assessment.

Inclusion criteria

- Patients presenting with complaints due to deviated nasal septum and diagnosed clinically, radiologically and/or endoscopically
- Patients of 17 years of age or more for surgical management

Exclusion criteria

- Patients less than 17 years of age
- Patients with acute upper respiratory tract infection.
- Patients with other nasal pathology requiring extensive surgery.
- Patients with any systemic diseases leading to surgical contraindication

Ethical clearance was obtained from ethical committee of Silchar Medical College and Hospital, Silchar and informed consent was taken from each patient. Proforma which included patient's name, age, sex, occupation, chief complaint, present history, past history, nose examination, anterior rhinoscopy, nasal endoscopy and radiological examination was used to collect the patient's information. Statistical Package of Social Science was used for Statistical analysis and Z-test was applied.

RESULTS

The incidence of DNS was found to be 19.79%. Most of the patients in this study were in the age group of 11-20 years (37.18%), followed by age group 21-30 years (26.44%). While 68.70% were males, 31.30% were females. Majority of the patients presented with deviation to the left (54.78%) followed by 36.52% of the cases having deviation to the right and 8.70% presented with bilateral deviation. In present study majority had a C deviation (59.09%). Among rest, 25.76% had dislocation and 15.15% had S deviation. 28.79% had spurs and they were found in combination with other type of DNS.

Table 1: Gender distribution of patients with deviated nasal septum.

Gender	No. of Cases	Percentage
Male	79	68.70%
Female	36	31.30%
Total	115	100%

Table 2: Distribution of patients according to side of septal deviation.

Septal deviation	No of cases	Percentage
Right	42	36.52%
Left	63	54.78%
Bilateral	10	8.70%
Total	115	100%

Table 3: Distribution of 115 cases of DNS according to symptoms at presentation.

Symptoms	No of cases	Percentage
Nasal obstruction	67	58.26%
Nasal discharge	38	33.04%
Headache	38	33.04%
Bleeding per nose	19	16.52%
Loss of smell	12	10.43%

A patient may have multiple presenting symptoms. Therefore, total count maybe higher than the sample size.

The aetiological factor was unknown in majority of the cases (58.33%). However, 14 cases (23.33%) had history of early childhood trauma/birth trauma followed by 11 cases (18.33%) with history of trauma of recent origin/recent past in adult life.

Of the total 115 cases diagnosed with DNS, the most common presenting symptom was nasal obstruction (58.26%) followed by nasal discharge (33.04%), headache (33.04%), bleeding per nose (16.52%). Loss of smell was detected in 10.43% of cases.

Table 4: Distribution of cases according to mean intraoperative time.

Surgery	No. of Cases	Mean time taken	Standard deviation
Conventional Septoplasty	30	36.35 mins	±5.33
Endoscopic Septoplasty	30	38.7 mins	±4.77

Table 5: Comparision of late post-operative complications of conventional septoplasty versus endoscopic septoplasty.

Complications	Conventional septoplasty	Endoscopic septoplasty	p value*
Bleeding	2/30 (6.67%)	0/30 (0%)	NS
Residual deviation/deformity (RD)	11/30 (36.67%)	2/30 (6.67%)	S (p<0.05); P= 0.0024
Synechae	5/30 (16.67%)	2/30 (6.67%)	NS
Septal perforation (SP)	2/30 (6.67%)	0/30 (0%)	NS

*Z test

Table 6: Comparision of post-operative symptoms relief of conventional septoplasty versus endoscopic septoplasty.

Complaints	Conventional septoplasty		% of benefit	Endoscopic septoplasty		% of Benefit	p value*
	Pre-op	Post-op		Pre-op	Post-op		
Nasal obstruction	30	9	70%	30	2	93.33%	S (<0.05) P= 0.00964
Nasal discharge	20	4	80%	21	3	85.71%	NS
Headache	25	7	72%	21	4	80.95%	NS
Bleeding per nose	10	2	80%	7	0	100%	NS
Hyposmia/loss of smell	4	4	0%	8	1	87.5%	S (<0.05) P= 0.00187

*Z test

Figure 1: DNS right with caudal dislocation.

Keeping the inclusion and exclusion criteria in view, of the total 60 patients with DNS who underwent surgery in this study group, nasal obstruction was the commonest symptom being present in all the 60 cases. This was followed by headache (76.67%), nasal discharge (68.33%), bleeding per nose (28.33%). Loss of smell was detected in 20% of the cases.

Figure 2: Intraoperative picture of same patient during conventional septoplasty.

The mean intra-operative time taken during conventional septoplasty was 36.35 min. with a standard deviation of

±5.33min. During endoscopic septoplasty, the mean intra-operative time was marginally more being 38.7 min with a standard deviation of ±4.77min.

Figure 3: Post-operative picture of same patient after conventional septoplasty.

The incidence of post-operative bleeding, residual deviation, synechae and septal perforation were 6.67%, 36.67%, 16.67% and 6.67% respectively in group A. Incidence of various post-operative complications in case of group B were 6.67% each in case of residual deviation and synechae with no incidence of any significant bleeding and septal perforation.

Figure 4: DNS left pre-operatively.

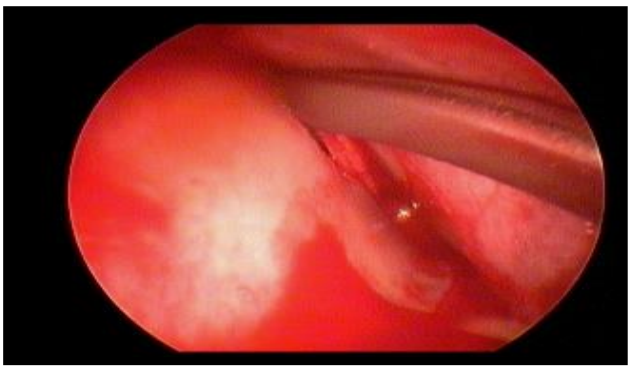

Figure 5: Intraoperative picture of endoscopic septoplasty.

In group A percentage of relief from nasal obstruction was 70%. Headache was relieved in 72% of cases while nasal discharge and bleeding per nose was relieved in 80% of the cases. There was no relief of hyposmia. The percentage of patients who were relieved of their symptoms in group B were 93.33% in case of nasal obstruction, 85.71% for nasal discharge and 80.95% for headache. Hyposmia was relieved in 87.5% of the cases. Bleeding per nose or epistaxis was relieved in 100% of the cases. The difference between the two operative procedures was statistically significant considering nasal obstruction and hyposmia as parameters.

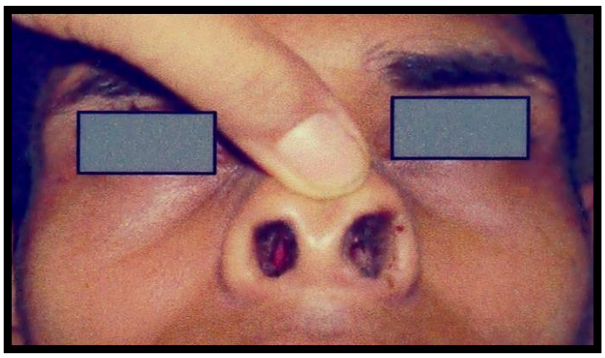

Figure 6: Post-operative picture of same patient after endoscopic septoplasty.

DISCUSSION

The incidence of DNS in present study was 19.79% which is similar to the study by Min et al where overall the incidence of deviated nasal septum was 22.38%.[9] Most of the patients diagnosed with DNS in this study were in the age group of 11-20years (37.18%) followed by 21-30 years (26.44%) with 68.70% being males and 31.30% being females with an approximate ratio of 2.19:1. The findings were in concordance with a study by Sinha SN et al.[10]

Majority of the patients presented with deviation to the left (54.78%), followed by 36.52% of the cases having deviation to the right. Only 8.70% of the patients had bilateral deviation. This was similar to the observation made by Daghistani KJ who reported that incidence of DNS was more the left side (55.6%).[11]

In the current study the aetiological factor was unknown in majority of the cases (58.33%). However, 23.33% (14 cases) had history of early childhood trauma/ birth trauma followed by 11 cases (18.33%) with history of trauma of recent origin/recent past in adult life. In the observation made by Olphen AFV, almost all deformities were caused by developmental disturbances and some kind of trauma.[12] Other authors like Fischer, Sessions RB and Toost T and Kamal also supported the hypothesis that trauma to the nose can lead to septal deviation.[11,13,14] Of the total 115 cases diagnosed with DNS, the most common presenting symptom was nasal obstruction (58.26%) followed by nasal discharge and headache with 33.04% of the cases each, and bleeding per nose (16.52%). Loss of smell was detected in 10.43% of cases.

A similar pattern of presenting complaints was also present in the 60 patients with DNS who underwent surgery in this study group. Nasal obstruction was present in all 60 cases (100%). This was followed by headache (76.67%), nasal discharge (68.33%), bleeding per nose (28.33%). Loss of smell was detected in 20% of cases put up for surgery. So in our study it was seen that maximum number of patients had nasal obstruction followed by headache, nasal discharge and bleeding per nose.

In a study by Iqbal SM et al, they found that majority of the patients presented with the nasal obstruction (90%) followed by the nasal discharge (20%) and headache (40%). Hyposmia was present in 6.4% of the patients.[15] These findings were similar to those of this study. In the study by Low WK, Willat DJ symptom seen in patients were of snoring (57.3%), headache (48.0%), rhinorrhoea (38.7%), sneezing (30.7%), hyposmia (30.7%) and epistaxis (21.3%).[16]

In present study majority had a C deviation (59.09%). Among rest, 25.76% had dislocation and 15.15% had S deviation. 28.79% had spurs and they were found in combination with other type of DNS. In study by Moorthy PNS, the incidence of type of nasal septal deviation was found to be as follows: C shaped deviation (40%), spur (20%), caudal deviation or dislocation (16%), and S shaped deviation (30%).[17] The findings were not different from present study.

The mean intraoperative time taken during conventional septoplasty was 36.35 mins with a standard deviation of ±5.33mins. During endoscopic septoplasty, the mean intraoperative time taken during was 38.7 mins with a standard deviation of ±4.77min. Thus the time taken was highest in case of endoscopic septoplasty. Soo Kweon Koo et al, in their study reported the intraoperative time during endoscopic septoplasty was 32.48±2.76 minutes.[18] Paradis J, Rotenberg BW in their study comparing conventional versus endoscopic septoplasty found that operative time ($p<0.001$) significantly favoured the endoscopic group.[19] However, no such significant difference was found in this study.

Various studies were conducted by many authors to study the incidence of late post-operative complications of conventional septoplasty and endoscopic septoplasty. In the present study, considering conventional septoplasty the incidence of post-operative bleeding following was 6.67%. Residual deviation was found to be 36.67%, synechae was 16.67% while incidence of septal perforation was 6.67%. The above findings were similar to those of other studies.

The incidences of various post-operative complications in case of endoscopic septoplasty in this study were 6.67% each in case of residual deviation and synechae. There was no incidence of any significant bleeding and septal perforation. The above findings were similar to those of other studies.

Table 7: Comparison of post-operative complications of conventional septoplasty in present study with various previous studies.

	Leena jain et al[6]	DC Satyaki et al[20]	SS Suligavi et al[21]	Kamran et al[22]	Manjunath et al[23]	Present study
Bleeding	-	24%	26%	3%	4%	6.67%
Residual Deviation/deformity	36%	-	14%	2%	-	36.67%
Synechae	20%	16%	20%	1%	4%	16.67%
Septal Perforation	-	-	-	2%	0%	6.67%

Table 8: Comparison of post-operative complications of endoscopic septoplasty in present study with various previous studies.

	Leena jain et al[6]	SS Suligavi et al[21]	Manjunath et al[23]	Chung et al[24]	Present study
Bleeding	-	14%	4%	0.9%	0%
Residual Deviation/ Deformity(RD)	13%	16%	-	0.9%	6.67%
Synechae	0%	6%	4%	2.6%	6.67%
Septal Perforation (SP)	-	-	0%	3.4%	0%

To summarise, in this study, out of the 60 operated cases, the difference between Conventional and Endoscopic Septoplasty was found to be significant with respect to residual deviation. In the study by Leena Jain et al., similar statistically significant difference was found on comparision of conventional septoplasty and endoscopic septoplasty.[6]

Out of the 30 cases that underwent conventional septoplasty in this study, nasal obstruction persisted in

only 9 out of the initially presenting 30 cases with percentage of relief being 70%. Headache was present in 7 out of 25 cases and bleeding per nose continued in 2 out of the initial 10 cases at presentation. Thus headache was relieved in 72% of cases while bleeding per nose was relieved in 80% of the cases. There was no relief of hyposmia. Nasal discharge continued in 4 out of initial 20 cases. The percentage of relief of pre-operative symptoms was 80% for nasal discharge. The above findings were similar to those of other studies.

Table 9: Comparison of percentage of symptom relief of conventional septoplasty in present study with various previous studies.

	Suligavi et al[21]	Gupta et al[25]	Leena Jain et al[6]	DC Sathyaki et al[20]	Present study
Nasal obstruction	80%	84%	38%	88%	70%
Nasal discharge	90%	76%	36%	100%	80%
Headache	85.71%	92%	50%	80%	72%
Bleeding per nose	-	-	-	100%	80%
Hyposmia	66.6%	-	0%	100%	0%

Among the 30 cases which underwent endoscopic septoplasty in this study even after surgery, nasal obstruction was present in 2 out of 30 cases and headache persisted in 4 out of the initially presenting 21 cases. 3 out of 21 and 1 out of 8 patients had nasal discharge and hyposmia respectively in the post-operative follow up. There was complete relief of bleeding per nose. The percentage of patients who were relieved of their symptoms was thus: 93.33% in case of nasal obstruction, 85.71% for nasal discharge and 80.95% for headache. Hyposmia was relieved in 87.5% of the cases. Bleeding per nose or epistaxis was relieved in 100% of the cases. The findings of the aforementioned studies were found to be similar to those of the present study.

Table 10: Comparison of percentage of symptom relief of endoscopic septoplasty in present study with various previous studies.

	Suligavi et al[21]	Gupta et al[25]	Leena Jain et al[6]	DC Sathyaki et al[20]	Present study
Nasal obstruction	96%	96%	96%	96%	93.33%
Nasal discharge	100%	88%	30%	100%	85.71%
Headache	94.4%	100%	54%	100%	80.95%
Bleeding per nose	-	-	-	-	100%
Hyposmia	100%	-	10%	100%	87.5%

In this study, as compared to conventional septoplasty, post-operative percentage benefits were better in case of endoscopic septoplasty considering all parameters i.e nasal obstruction, headache, nasal discharge, bleeding per nose and hyposmia. The advantage of endoscopic septoplasty as a method of surgical management of DNS was found to be statistically significant (p value <0.05) considering nasal obstruction and hyposmia as parameters.

In the study by Jain L et al, similar statistically significant difference was found on comparision of conventional septoplasty and endoscopic septoplasty. In another study by Sulligavi et al, the difference was significant similar to this study.[6,21]

As stated earlier, conventional septoplasty employ conventional technique using head light for surgery. Endoscopic septoplasty on the other hand, as the name suggests employs the nasal endoscope for correction of septal deviation.

In this study, as compared to conventional septoplasty, post-operative percentage benefits were better in case of endoscopic septoplasty in all parameters like nasal obstruction, headache, nasal discharge, bleeding per nose and hyposmia. The advantage of endoscopic septoplasty as a method of surgical management of DNS was however found to be statistically significant (p value < 0.05) considering nasal obstruction and hyposmia as parameters.

In addition, the incidence of post-operative complications was comparatively less in case of endoscopic septoplasty especially residual deviation which was found to be significantly higher in conventional septoplasty. Thus

endoscopic septoplasty may be considered as a better procedure for surgical correction of deviated nasal septum.

CONCLUSION

Deviated nasal septum may or may not present with the symptoms. It can be treated surgically by either conventional or endoscopic septoplasty. Both techniques have their own advantages and disadvantages.

Endoscopic septoplasty is an effective technique with better illumination thus identifying the pathology accurately helping in limited dissection & manipulation of the mucosal flap and septal cartilage. It also leads to minimal morbidity and is excellent teaching tool. The disadvantages are loss of binocular vision and repeated cleaning of endoscope.

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