Original Research Article

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

K. Sharath Babu1*, R. Shankar2

1Department of ENT, Saraswati Medical College, Unnau, Uttar Pradesh, India
2Department of Preventive Medicine, Vinayaka Mission's Kirupananda Variyar Medical College and Hospital, Salem, Tamil Nadu, India

Received: 11 November 2019
Revised: 03 January 2020
Accepted: 04 January 2020

*Correspondence:
Dr. K. Sharath Babu,
E-mail: shnkr_radhakrishnan@yahoo.com

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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 cribiform 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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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 polypsis, 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.\textsuperscript{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 3\textsuperscript{rd} 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 preoperatively 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 a 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 N (%) | Female N (%) | Male N (%) | Female 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  |
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. 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. 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.

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. Paradis et al in their study comparing conventional versus endoscopic septoplasty found that operative time (p<0.001) significantly favoured the endoscopic group. However, no such significant difference was found in this study and a study conducted by Khan et al had also quoted a similar finding.

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. 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. 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. In another study by Sulligavi et al, the difference was significant similar to our study. 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.
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 less resection. The only disadvantage of using endoscopic septoplasty was of binocular vision and repeated cleaning of the endoscope.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Babu KS, Shankar R. Surgical outcome comparison between endoscopic septoplasty and conventional septoplasty among patients with nasal septal deviation. Int J Otorhinolaryngol Head Neck Surg 2020;6:501-5.