

# Comparative Study of Conventional Septoplasty with Endoscopic Septoplasty at A Tertiary Hospital

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## Abstract

**Background:** A deviated septum can be asymptomatic or can cause functional and cosmetic abnormalities. Septoplasty is the standard treatment offered for symptomatic deviated nasal septum. The technique of septoplasty has evolved over the decades, from forcible fractures and splinting to submucous resection, classical septoplasty done via Cottle's premaxilla-maxilla approach and in the last two decades, the endoscopic septoplasty. Aim of the present study was to compare the conventional and endoscopic septoplasty at our tertiary hospital. **Material and Methods:** Present study was single-center, prospective, comparative, study, conducted in patients of 18-60 years age, of either gender, with symptomatic DNS with no other co-morbidities, posted for surgical treatment. 60 patients posted for DNS correction surgery were divided equally into two groups (n=30) by random selection, as group C (conventional septoplasty) and the group E (endoscopic septoplasty). **Results:** Majority of patients were male (61.67 %), from 19-30 & 31-40 years age group (21.67 % each). Age, gender & various associated lateral wall pathologies were comparable in both groups & difference was statistically not significant (p>0.05). In Conventional septoplasty Group, mean duration of surgery was 42.20 ± 5.81 minutes & in Endoscopic septoplasty Group, mean duration of surgery was 38.08 ± 6.72 minutes, mean duration of surgery between two groups & difference was highly significant (p - 0.001). Mean duration of surgery between two groups & difference was highly significant (p - 0.001). In Conventional septoplasty Group, major complications noted were U/L flap tear (20 %), bleeding (16.67 %), residual deviation (13.33 %) & septal hematoma (10 %). Incidence of complications between two groups & difference was statistically significant (p - 0.013). No incidence of septal perforation was noted in either group. **Conclusion:** Endoscopic septoplasty provides better illumination which helps intraoperatively to identify septal deviation accurately, reduces duration of surgery as well as reduced postoperative complications due to limited dissection and lesser trauma to septal cartilage.

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

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## Introduction

A deviated septum is an abnormal condition in which the top of the cartilaginous ridge leans to the left or the right, causing obstruction of the affected nasal passage. A deviated septum can be asymptomatic or can cause functional and cosmetic abnormalities. Deviated nasal septum is the most common cause of nasal obstruction. Apart from nasal

obstruction, a severely deviated septum can cause epistaxis, headache, and sinusitis attributable to contact with lateral nasal wall.<sup>1</sup>

Septoplasty is the standard treatment offered for symptomatic deviated nasal septum. Septoplasty is a well-established procedure in nasal obstruction caused by septal deviation resistant to medical management.<sup>2</sup> The technique of septoplasty has evolved over the decades, from forcible fractures and splinting to submucous resection, classical septoplasty done via Cottle's premaxilla-maxilla approach and in the last two decades, the endoscopic septoplasty.<sup>3,4</sup>

It is conventionally performed under direct visualization using a headlight and nasal speculum. Endoscopic septoplasty is a conservative surgery in which only the deviated portion of septum is removed leaving behind as much cartilage and bone as possible to maintain the structural and functional integrity of the nose. Endoscope aided limited resection and thus more conservation by guiding precise shaving of septal cartilage. Aim of the present study was to compare the conventional and endoscopic septoplasty at our tertiary hospital.

### Material And Methods

Present study was single-center, prospective, comparative, study, conducted in department of Otorhinolaryngology, at XXX medical college & hospital, XXX, India. Study duration was of 2 years (July 2019 to June 2021). Study was approved by institutional ethical committee.

#### Inclusion criteria

- Patients of 18-60 years age, of either gender, with symptomatic DNS with no other co-morbidities, posted for surgical treatment

#### Exclusion criteria

- patients with DNS along with allergic rhinitis, upper respiratory tract infections, sinusitis,
- patients with other co-morbidities and unfit for surgery

Study was explained to patients in local language & a written informed consent was taken. Patients 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. After complete preoperative assessment patients were subjected to surgical intervention.

60 patients posted for DNS correction surgery were divided equally into two groups (n=30) by random selection, as group C (conventional septoplasty) and the group E (endoscopic septoplasty) in operation theatre. Postoperatively, patients received appropriate monitoring, antibiotics, along with analgesics and decongestants. Nasal pack was 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.

Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Frequency, percentage, means and standard deviations (SD) was calculated for the continuous variables, while ratios and proportions were calculated for the categorical variables. Difference of proportions between qualitative variables were tested using chi-square test or Fisher exact test as applicable. P value less than 0.5 was considered as statistically significant.

## Results

In present study, 60 patients posted for DNS correction surgery were randomly divided into two groups (n=30), as group C (conventional septoplasty) and the group E (endoscopic septoplasty). Majority of patients were male (61.67 %), from 19-30 & 31-40 years age group (21.67 % each). Age & gender were comparable in both groups & difference was statistically not significant ( $p>0.05$ ).

**Table 1: Age and gender distribution**

Gender	Conventional septoplasty Group C (N=30)		Endoscopic septoplasty Group E (N=30)		Total (N=60)		
	Male	Female	Male	Female	Male	Female	Total
19-30 yrs	5 (16.67 %)	4 (13.33 %)	6 (20 %)	4 (13.33 %)	11 (18.33 %)	8 (13.33 %)	19 (21.67 %)
31-40 yrs	5 (16.67 %)	4 (13.33 %)	7 (23.33 %)	3 (10 %)	12 (20 %)	7 (11.67 %)	19 (21.67 %)
41-50 yrs	5 (16.67 %)	3 (10 %)	3 (10 %)	2 (6.67 %)	8 (13.33 %)	5 (8.33 %)	13 (21.67 %)
51-60 yrs	3 (10 %)	1 (3.33 %)	3 (10 %)	2 (6.67 %)	6 (10 %)	3 (5 %)	9 (15 %)
Total	18 (60 %)	12 (40 %)	19 (63.33 %)	11 (36.67 %)	37 (61.67 %)	23 (38.33 %)	60

In present study majority of patients had various associated lateral wall pathologies such as inferior turbinate hypertrophy, concha bullosa, variation of uncinat process & paradoxical middle turbinate. We compared associated lateral wall pathologies between two groups & difference was statistically not significant ( $p>0.05$ ).

**Table 2: Associated lateral wall pathology prevalence.**

Associated pathology	Conventional septoplasty Group C (N=30)		Endoscopic septoplasty Group E (N=30)	
	Number of cases	Percentage (%)	Number of cases	Percentage (%)
Inferior turbinate hypertrophy	15	50.00	16	53.33
Concha bullosa	5	16.67	4	13.33
Variation of uncinat process	4	13.33	3	10.00
Paradoxical middle turbinate	3	10.00	3	10.00
Polyps	2	6.67	2	6.67
Enlarged bulla	1	3.33	2	6.67

In Conventional septoplasty Group, mean duration of surgery was  $42.20 \pm 5.81$  minutes & majorities of surgeries were completed in 41 to 50 minutes (46.67 %). In Endoscopic septoplasty Group, mean duration of surgery was  $38.08 \pm 6.72$  minutes & majorities of surgeries were completed in 31 to 40 minutes (36.67 %). We compared mean duration of surgery between two groups & difference was highly significant ( $p - 0.001$ ).

**Table 3: Comparison of duration of surgery**

Duration (in minutes)	Conventional septoplasty Group C (N=30)		Endoscopic septoplasty Group E (N=30)	
	Number of cases	Percentage (%)	Number of cases	Percentage (%)
21-30	2	6.67	7	23.33
31-40	9	30.00	11	36.67
41-50	14	46.67	9	30.00
>50	5	16.67	3	10.00
Mean $\pm$ SD	42.20 $\pm$ 5.81		38.08 $\pm$ 6.72	
p value	0.001 Highly Significant			

In Conventional septoplasty Group, major complications noted were U/L flap tear (20 %), bleeding (16.67 %), residual deviation (13.33 %) & septal hematoma (10 %). In Endoscopic septoplasty Group, major complications noted were U/L flap tear (6.67 %), bleeding (6.67 %), residual deviation (3.33 %) & septal hematoma (3.33 %). We compared incidence of complications between two groups & difference was statistically significant (p - 0.013). No incidence of septal perforation was noted in either group.

**Table 4: Complications**

Complication	Conventional septoplasty Group C (N=30)		Endoscopic septoplasty Group E (N=30)	
	Number of cases	Percentage (%)	Number of cases	Percentage (%)
U/L flap tear	6	20.00	2	6.67
Bleeding	5	16.67	2	6.67
Residual deviation	4	13.33	1	3.33
Septal hematoma	3	10.00	1	3.33

## Discussion

Numerous surgical techniques are available but each surgical procedure has its limitations and cannot deal with all the variants of the deformities of the nasal septum.<sup>6</sup> 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. For minimal and posterior deviations of the septum, endoscopic septoplasty is better, whereas for anterior deviations, conventional septoplasty could be better choice.

In study by Nayak DR *et al.*,<sup>7</sup> 78.3% patients had complaint of nasal obstruction. Headache was present in 76.66%, rhinorrhea in 45%, PND in 58.33% and hyposmia in 8.33%. In another study conducted by Gulati *et al.*,<sup>8</sup> nasal obstruction was complained by 92% patients, Headache by 58% patients, catarrh in 50 % patients and post-nasal discharge in 30%. Similar findings were noted in present study.

Ankita S *et al.*,<sup>9</sup> studied 44 patients, randomly divided in two groups, & noted that endoscopic approach showed better overall clinical results, irrespective of the site of deviation. It was noted that correcting posterior deviations required shorter time and had lesser blood loss when operated using the endoscope whereas anterior deviations were dealt faster and had lesser bleeding by the conventional method. There was less pain and morbidity in the postoperative period in the endoscopic group as compared to conventional group.

Doomra S *et al.*,<sup>10</sup> conducted a prospective study on 50 patients having symptomatic deviated nasal septum and refractory to medical treatment. The patients were divided into Group A (underwent conventional septoplasty) and Group B, (underwent endoscopic septoplasty). Nasal obstruction was relieved in 79.1% cases belonging to Group A and 91.3% cases to Group B. Headache was relieved in 62.5% cases belonging to Group A and 93.3% cases to Group B. Postnasal drip was relieved in 73.3% cases in Group A and 94.1% cases in Group B. The results were found to be statistically significant. An improvement in visual analog scale score was observed in both groups, but statistically significant difference was seen at 2nd and 4th week. Postoperative nasal patency improvement was observed in both groups by the Gertner plate, and the results were found to be statistically significant. Postoperative hemorrhage was observed in 24% cases in Group A and 12% cases in Group B. Septal perforation, septal hematoma, and mucosal tear were observed in 4%, 4%, and 8% of cases, respectively, in Group A. No such complication was reported in Group B.

Gulati *et al.*,<sup>8</sup> reported that there was a statistically significant difference between the two groups as regards nasal obstruction, headache, recurrent rhinorrhea, hyposmia, and postnasal drip ( $P < 0.05$ ). Bothra *et al.*,<sup>11</sup> compared conventional versus endoscopic septoplasty for limited deviations and spur on 80 patients and found no statistically significant difference in surgical outcomes in the conventional and endoscopic surgery groups. However, post-operative complications such as hemorrhage, infraorbital edema and nasal pain were slightly more in the conventional septoplasty group.

In a review of literature, Champagne C *et al.*,<sup>12</sup> noted that endoscopic septoplasty improves visualization of septal deviation, especially in the posterior and inferior area, shortens surgery, and provides a better anatomic result, shorter hospital stay, reduced residual pain, with less residual deviation, and synechia, fewer intraoperative complications (mucosal damage, hemorrhage) and a functional result identical to that of conventional septoplasty. I Nasr *et al.*,<sup>13</sup> noted that endoscopic septoplasty showed a better reduction in nasal obstruction than conventional septoplasty; however, the postoperative reduction on the size of the inferior turbinate and NSQ score were highly significant in both groups ( $P = 0.001$ ).

Suraneni VR *et al.*,<sup>14</sup> conducted a study on 100 cases found that complications were seen more in conventional septoplasty as compared to endoscopic septoplasty. In study by Singh A *et al.*,<sup>9</sup> found lower incidence of complications in patients undergoing endoscopic septoplasty as compared to conventional septoplasty. Furthermore, Rambabu *et al.*,<sup>15</sup> in his study on 100 patients undergoing septoplasty, found endoscopic septoplasty superior than conventional septoplasty with fewer complications in the earlier technique. Similar findings can be noted in present study.

The conventional surgeries for septal correction improve nasal airway but had various drawbacks such as 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.<sup>16</sup>

Endoscopic septoplasty is a fast developing concept and gaining popularity. It provides a direct approach to the septal anatomic deformity, allowing minimally invasive procedure with limited septal mucosal flap dissection and removal of a small cartilaginous and/ or bony septal deformity. But endoscopic septoplasty also has got its own drawbacks which includes learning curve, adjustment towards single handed surgery. Despite several benefits, ES can be difficult because of frequent soiling of the lens of the endoscope by blood from the incision site and difficulty in finding enough space for the endoscope and dissectors in narrow septal mucosal tunnels.

Endoscopic septoplasty surgery can be combined safely with various surgeries like adenoidectomy, septal perforation repair, septorhinoplasty, endoscopic skull base procedures, endoscopic DCR and endoscopic sinonasal surgery for the optimal results.

**Conclusion**

Endoscopic septoplasty provides better illumination which helps intraoperatively to identify septal deviation accurately, reduces duration of surgery as well as reduced postoperative complications due to limited dissection and lesser trauma to septal cartilage.

**Conflict of Interest:** None to declare

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