

# Comparison of pre and post-operative nasal obstruction in endoscopic septoplasty and conventional septoplasty

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## Abstract

Apart from nasal obstruction, a significantly deviated nasal septum has been involved in epistaxis, sinusitis, obstructive sleep apnea, and headaches. These conditions are also accepted indications for septoplasty, although some, such as facial pain or headache, may be controversial. Additionally, if the deviated nasal septum impairs access to the middle meatus, it is necessary to perform septoplasty during endoscopic sinus surgery. **Methods:** It was a prospective and comparative type study. Study was conducted from sep 2017 to May 2018. The present study included 60 cases. Clinical assessment was done in all 60 patients after dividing them into 2 groups out of which 30 underwent endoscopic septoplasty and 30 conventional septoplasty. Age range varied from (>13 years) with a mean age of 27 years. **Results:** 33.3% of patients had DNS to left side, 53.3% patients to right side and 13.3% of patients had S shaped DNS in endoscopic group. In case of conventional septoplasty the percentage for left side, right side and S shaped DNS are 36.7%, 53.3% and 10% respectively. Pre and post operative nasal airflow in endoscopic septoplasty group showed that there were 4 patients belonging to 0-1 cm<sup>2</sup> group preoperatively and post operatively we found no patients in this group, 16 patients belonging to 2-3 cm<sup>2</sup> group preoperatively and the number of patients decreased in this group to 4 post operatively. **Conclusion:** We conclude from this study that Endoscopic Septoplasty is a safe, effective and more conservative approach with better results and less complications as compared to the Conventional Septoplasty.

**Key Word:**

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## INTRODUCTION

Nasal obstruction is a common complaint. In 1974, Vainio-Mattila found a 33% incidence of nasal airway obstruction among randomly chosen adults.<sup>1</sup> Septal deviation was found to be the most frequently encountered structural malformation causing nasal obstruction. Clinically significant septal deviation was

found in 26% of patients with nasal obstruction in this study. Developmental septal deviation may occur. Patients in whom the septal cartilage has been damaged in the neonatal period and during birth can present with severe septal deviation in the absence of a history of nasal trauma. Microfractures sustained during late intrauterine life and during birth may cause weakness in the damaged side of the cartilage. The result is asymmetric bending of the cartilage toward the side of the injury, while the contralateral side achieves dominance over time. These conclusions are supported by evidence matching the direction of septal deviation with the presentation of the fetal head in the pelvis during delivery. Septal deviation from traumatic impact can occur in childhood or adult life. Childhood trauma can cause severe nasal obstructive problems in adult life because any degree of septal deviation usually becomes more pronounced with time. Depending on the direction and force of the nasal injury, septal cartilage can fracture horizontally or vertically,

with single or multiple fracture lines, and can be accompanied by damage to the nasal bones or to the perpendicular plate of the ethmoid. In addition, the cartilaginous septum can subluxate from the vomeral sulcus. Usually, the junction of the bony and cartilaginous septum is the area of maximum deviation due to trauma. Septal cartilage provides structural support for the nasal dorsum while maintaining a remarkable degree of elasticity. It can absorb large amounts of force without permanent deformity. When the amount of force applied to the cartilage exceeds its biomechanical stress point, the cartilage fractures. In the absence of trauma, septal cartilage is usually straight. Each side of the cartilage has an internal tension that is evenly balanced. Traumatic injury usually causes asymmetric damage to the cartilage, resulting in the dominance of one side over the other. Over time, the dominant side of the septal cartilage exhibits marked overgrowth relative to the contralateral side. A deviation results, with the convex side exhibiting the dominant growth pattern. This is often the side ipsilateral to the injury. The magnitude of injury required to generate a significant septal deviation is inversely proportional to the patient's age. In childhood, particularly during the adolescent growth years, even insignificant trauma to the nose can produce unilateral microfractures that have severe impact upon the growth pattern of the patient's septal cartilage. Only patients with symptomatic DNS will require surgical intervention like difficulty in breathing and require treatment.<sup>2</sup> Symptoms of a deviated septum include sinusitis, sleep apnea, snoring, recurrent sneezing, facial pain, nose bleeds, difficulty in breathing and mild to severe loss of ability to smell.<sup>2,3</sup> The nasal septum is made of bone and cartilage that separates the nasal cavity into the two nostrils. The cartilage is called the quadrangular cartilage and the bones comprising the septum include the maxillary crest, vomer and the perpendicular plate of the ethmoid. Normally, the septum lies centrally, and thus the nasal passages are symmetrical.<sup>4</sup> 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. The condition can result in poor drainage of the sinuses. People can also complain of difficulty in nasal breathing, headaches, bleeding per nose, or of sleeping disorders such as snoring or sleep apnea.<sup>4</sup>

## METHODS

It was a prospective and comparative type study. Study was conducted from Sep 2017 to May 2018. The present study included 60 cases. Clinical assessment was done in

all 60 patients after dividing them into 2 groups out of which 30 underwent endoscopic septoplasty and 30 conventional septoplasty. Age range varied from (>13 years) with a mean age of 27 years.

### Inclusion Criteria:

- Patients of symptomatic DNS undergoing septoplasty under L/A, not responding to conservative medical therapy for 4 weeks.
- Gender: Both
- Age: > 13 years.

### Exclusion Criteria:

- Revision cases
- Septoplasty done along with other nasal surgeries (Endoscopic sinus surgery, septorhinoplasty and turbinate reduction).
- Septoplasties needing packing intraop or postop due to bleeding.
- DNS with columellar dislocation.

Patients with symptomatic DNS were selected. Random allocation for endoscopic or conventional septoplasty was done by double blinding method. Preop nasal obstruction symptom score was noted on the day before surgery using a 5 point grading scale. The questionnaire translated into Hindi/ Bangla language was provided to patients. Intraoperative time in minutes recorded from time of infiltrating local anesthetic agent to application of sutures. Postoperative pain on visual analogue scale was assessed on 1<sup>st</sup> postoperative day in both the groups. Postoperative nasal obstruction symptom score was evaluated on 4 weeks follow up. Measurement tool for nasal obstruction used was Nasal Obstruction Symptom Evaluation Score as Not a problem = 0, Very mild problem = 1, Moderate problem = 2, Fairly bad problem = 3, Severe problem = 4. Tool used for pain grading was visual analogue scale on the ratings of 1-10. Intraoperative time was recorded in minutes.

The patients were advised the following medications post operatively:

- Tab Amoxicillin + Clavunic Acid (500mg + 125 mg) thrice daily for 1 week.
- Tab Fexofenadine 180mg orally HS x 5 days.
- Tab Ibuprofen 400mg + paracetamol 500mg 1 tab orally TDS x 3 days.
- Oxymetazoline nasal drop 3 drops 3 times daily x 5 days.
- Neosporin ointment (local application) intranasal BD x 5 days.
- Alkaline nasal douching 3 times daily x 2 weeks. (30 gm sodium bicarbonate and 60 gm sodium chloride in 1Litre water)

## RESULTS

**Table 1:** Age and Sex Distribution of the patients in Endoscopic and Conventional Septoplasty

Age Group	Endoscopic				Conventional				p Value
	Male	%	Female	%	Male	%	Female	%	
14-20	04	13.3	02	6.7	05	16.7	03	10.0	<b>&lt;0.001</b>
21-30	12	40.0	04	13.3	09	30.0	03	10.0	
31-40	04	13.3	01	3.3	04	13.3	02	6.7	
>40	02	6.7	01	3.3	03	10.0	01	3.3	
<b>Total</b>	<b>22</b>	<b>73.3</b>	<b>08</b>	<b>26.7</b>	<b>21</b>	<b>70</b>	<b>09</b>	<b>30</b>	

The present study included 60 cases. Clinical assessment was done in all 60 patients after dividing them into 2 groups out of which 30 underwent endoscopic septoplasty and 30 conventional septoplasty. Age range varied from (>13 years) with a mean age of 27 years and SD value of  $\pm 8.221$ . Most common age group involved was 21-30 years with (n=16) involving 26.7% of cases. The least common age group was patients >40 years (n=3) involving 5% of cases. Majority of patients in this study were males 71.7% (n=43) and 28.3% (n=17) were female. We found the p value <0.001 which is statistically significant.

**Table 2:** Pre-operative symptoms of the patients in Endoscopic and Conventional Septoplasty

Symptoms	Endoscopic		Conventional	
	No of Patients (n=30)	Percentage (%)	No of Patients (n=30)	Percentage (%)
Nasal Block	12	40.0	14	46.7
Nasal Discharge	08	26.7	06	20.0
Headache	06	20.0	05	16.7
Hyposmia	02	6.7	02	6.7
Bleeding	02	6.7	03	10.0

Nasal blockage was the commonest symptom in both the groups involving (n=12) 40% in Endoscopic group and (n=14) 46.7% in Conventional group. Headache was present in 20% of patients in endoscopic group and 16.7% of patients in conventional group. Equal no. of patients (n=2) 6.7% were seen in both the groups presenting with Hyposmia. Bleeding was present in 6.7% and 10% patients in endoscopic and conventional group respectively. 33.3% (n=10) of patients had DNS to left side, 53.3% (n=16) patients to right side and 13.3% (n=4) of patients had S shaped DNS in endoscopic group. In case of conventional septoplasty the percentage for left side, right side and S shaped DNS are 36.7% (n=11), 53.3% (n=16) and 10% (n=3) respectively. And we found the p Value <0.005 which is statistically significant.

**Table 3:** Pre and post operative Nasal airflow of the patients in Endoscopic septoplasty

Nasal airflow (cm <sup>2</sup> )	Pre-operative		Post-operative	
	No. of Patients	Percentage (%)	No. of Patients	Percentage (%)
0-1	04	13.3	00	0.0
2-3	16	53.3	04	13.3
4-5	07	23.3	18	60.0
6-9	03	10.0	08	26.7
<b>Total</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>

We shows the pre and post operative nasal airflow in endoscopic septoplasty group. In endoscopic septoplasty group there were 4 patients (13.3%) belonging to 0-1 group preoperatively and post operatively we found no patients in this group, 16 (53.3%) patients belonging to 2-3 cm<sup>2</sup> group preoperatively and the number of patients decreased in this group to 4 (13.3%) patients post operatively, 7 (23.3%) patients belonging to 4-5 cm<sup>2</sup> group preoperatively and the number of patients increased in this group 18 patients (60%) postoperatively. In 6-9 cm<sup>2</sup> group 3 (10%) and 8 (26.7%) patients were belonging pre-operative and post-operative respectively. We shows the pre and post operative nasal airflow in conventional septoplasty group. In this septoplasty group there were 5 patients (16.7%) belonging to 0-1 cm<sup>2</sup> group preoperatively and post operatively we found no patients in this group, 14 (46.7%) patients belonging to 2-3 cm<sup>2</sup> group preoperatively and the number of patients decreased in this group to 5 (16.7%) patients post operatively, 7 (23.3%) patients belonging to 4-5 cm<sup>2</sup> group preoperatively and the number of patients increased in this group 18 patients (60%) postoperatively. In 6-9 cm<sup>2</sup> group 4 (13.3%) and 7 (23.3%) patients were belonging pre-operative and post-operative respectively.

**Table 4:** Duration of surgery in endoscopic and conventional Septoplasty

Duration of surgery	Endoscopic		Conventional	
	No. of Patients	Percentage (%)	No. of Patients	Percentage (%)
< 60 minutes	20	66.7	12	40.0
60 minutes	06	20.0	08	26.7
> 60 minutes	04	13.3	10	33.3
Total	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>

**Table 5:** Intra-operative complications in endoscopic and conventional Septoplasty

Intra-operative Complication	Endoscopic		Conventional	
	No of Patients	Percentage (%)	No of Patients	Percentage (%)
No complication	18	60.0	08	26.7
Unilateral mucosal tear	07	23.3	12	40.0
Bilateral mucosal tear	05	16.7	10	33.3
Total	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>

The symptoms of the patients on the 1<sup>st</sup> post operative day for both Endoscopic and Conventional group. Maximum number of patients had pain/headache as major complication. Endoscopic and Conventional group consisted 33.3% and 40% patients who had this particular complication respectively. 1 week of post operative follow up we found that, Maximum number of the patients in Endoscopic groups had no complication, involving (n=16)53.4% and only (n=08) 26% patients in Conventional group. Endoscopic and Conventional group consist 23.3% and 30% patients who had Nasal Block, 3.3% and 16.6% patients had Infection, and 20% and 26.7% patients had pain/headache respectively. Nasal block and pain/headache was the commonest symptom in both the groups involving (n=5)16.7% in Endoscopic group and (n=08) 26.6% in Conventional group in 2<sup>nd</sup> week of post operative follow-up. After 3<sup>rd</sup> week of post operative follow-up it can be easily interpreted that maximum no of patients i.e. 40% (n=24) belonged to Endoscopic group showed no complication. Nasal block and pain/headache remained in both the groups. Post operative NOSE score for both endoscopic and conventional group. After evaluating the post operative NOSE score we found Endoscopic group consisted maximum number of patients who had no complication.

### DISCUSSION

The present study included 60 cases. Clinical assessment was done in all 60 patients after dividing them into 2 groups out of which 30 underwent endoscopic septoplasty and 30 conventional septoplasty. Age range varied from (>13 years) with a mean age of 27 years and SD value of ±8.221. Most common age group involved was between 21-30 years with (n=16) involving 26.7% of cases. The least common age group was patients >40 years (n=3) involving 5% of cases. Majority of patients in this study were males 71.7% (n=43) and 28.3% (n=17) were female. We found the p value 0.000 which is statistically significant. Gulati *et al* (2009) performed a comparative

study of endoscopic and conventional septoplasty on 50 patients having symptomatic DNS, 25 patient in each group to assess the merits and demerits of endoscopic septoplasty. In his study all the patients were in the age group of 18 -40 years, maximum were in the age group of (up to 25 years); 64 % in conventional septoplasty group and 72% in endoscopic group<sup>5</sup>. Basavaraj *et al* (2011) did a study on 151 patients to compare the result of septoplasty with or without nasal packing, in their study 126 (83.4%) patients were in the age group of 10 - 30 years and only 26.6% of patients were above 30 years.<sup>6</sup> Jain *et al* (2011) did a comparative study on 100 patients and found that most commonly affected subjects belonged to 2nd and 3rd decade of life in both the sexes with 37% and 36% respectively in both the age group.<sup>7</sup> In our study while comparing the Conventional Septoplasty with that of Endoscopic Septoplasty we included 30 patients in both the group and found that the most common age group affected was between 16- 35 years which accounted for 76% of the study population, amongst this 40 % belonged to the age group of 16-25 years. And rest 36% belonged to the age group of 26-35 years, which was consistent with the study performed by Gulati *et al*, Basavaraj *et al* and Jain *et al*. No patients in our study were children, thus the risk of nasal deformity during the follow up were excluded<sup>5,6</sup>. In our study Nasal blockage was the commonest symptom in both the groups involving (n=12) 40% in Endoscopic group and (n=14) 46.7% in Conventional group. Headache was present in 20% of patients in endoscopic group and 16.7 % of patients in conventional group. Equal no. of patients (n=2) 6.7% were seen in both the groups presenting with Hyposmia. Bleeding per nose or epistaxis was present in 6.7% and 10% patients in endoscopic and conventional group respectively.

Nasal Obstruction	Our study		Salama MA <sup>[8]</sup>
	Conventional	Endoscopic	90%
	46.7%	40%	

**Duration of surgery:** Duration of the surgery was divided into three groups: <60 minutes, 60 minutes and > 60 minutes. In case of 20 patients (66.7%) it took <60 minutes for endoscopic septoplasty where the number of patients for conventional group was 12 (40%). 6 patients (20%) and 8 patients (26.7%) took exactly 60 minutes for endoscopic and conventional group respectively. >60 minutes group belonging 4 patients (13.3%) and 10 patients (33.3%) for endoscopic and conventional group respectively.

**Analysis of Intra-operative complications:** We found unilateral and bilateral mucosal tear as intra operative complication. In endoscopic group we found 7(23.3%) patients showed unilateral mucosal tear and 5 patients (16.7%) showed bilateral mucosal tear. In conventional group 12 patients (40%) and 10 (33.3%) patients showed unilateral and bilateral mucosal tear respectively. 18 patients (60%) and 8 patients (26.7%) showed no complication during the surgery in endoscopic and conventional group respectively. A retrospective study was done by Nishi Gupta (2005)<sup>9</sup> to review the endoscopic septoplasty patients for surgical indication, intra operative finding and post operative complications. Most of these cases were posted for endoscopic DCR and limited septoplasty was done to gain an access to the lacrimal sac area. A total of 48 patients underwent endoscopic septoplasty out of which 20(48%) were performed in conjugation with Endoscopic DCR. In 8 cases (16%) endoscopic septoplasty was performed alone as a primary procedure. 4 deviations were broadly based deflections(12%) , whereas 10 of septal deformities were septal spurs(20%) and in 4 (8%) of cases more than 1 type of septal deformities were encountered<sup>9</sup>. A retrospective study done by Sufian Nawaiseh and Nemer Al- Khtoum (2010)<sup>10</sup> on 60 patients to review for surgical indications, intra operative technique, findings and post operative complication of Endoscopic septoplasty. Nasal septal deviations were in the following order, 29(48%) of the deviations were broadly based deflections, whereas 23(38.3%) of the septal deformities were spurs. In 8(13.3%) patients more than 1 type of septal deformity was encountered.

**Analysis of postoperative NOSE Score:** We shows the post operative NOSE score for both endoscopic and conventional group. After evaluating the post operative NOSE score we found Endoscopic group consisted maximum number of patients who had no complication. The commonest complications seen during the intra operative period was unilateral mucosal tear which was

most common in conventional group compared to the endoscopic group, bilateral mucosal tear was again common in the conventional group, on subsequent follow up synechiae and septal perforation was common in conventional group. Synechiae was successfully treated by releasing them under local anaesthesia and packing the nasal cavities by ribbon gauze for 24-48 hours.

## CONCLUSION

We recommend this technique as the procedure of choice in patients with nasal obstruction due to DNS net responding to conservative medical therapy. It provides direct vision, and only a part of small flap needs to be elevated to remove the exact pathology. Thus making only minor anatomical alterative in the nasal septum, The final result is better patient compliance and a shorter recovery time since trauma and bleeding is much less and it provides greater stability to the nasal pyramid as only the deviated parts of the septum is removed compared to the Conventional Septoplasty using headlight illumination.

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