

ORIGINAL RESEARCH**A comparative analysis between conventional septoplasty and endoscopic septoplasty at a tertiary centre****Dr. Amit Kumar¹, Dr. Kumari Jyoti Mani², Dr. Satyendra Sharma³**¹Assistant Professor, ²Senior Resident, ³Professor & Head of Department, Department of Otorhinolaryngology (ENT), Nalanda Medical College & Hospital, Patna, Bihar, India**Corresponding Author:** Dr. Kumari Jyoti Mani

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Abstract

Background: Deviated nasal septum (DNS) is a prevalent anatomical condition that can significantly impair nasal airflow, leading to chronic nasal obstruction and associated morbidities. Surgical correction remains the definitive treatment for symptomatic DNS, with conventional septoplasty being the traditional approach for many years. Endoscopic septoplasty offers improved lighting, facilitating precise identification of septal deviation during surgery. This technique also results in shorter surgical time and less postoperative problems

Aim and objectives: A comparative analysis between conventional septoplasty and endoscopic septoplasty.

Materials and Methods: The present study was done in the Department of Otorhinolaryngology as a single-centre, prospective, randomised comparative study. Included in the study were patients between the ages of 18 and 60, of either gender, who had a deviated nasal septum (DNS) causing symptoms and were scheduled for surgical repair. 100 patients scheduled for DNS correction surgery were randomly divided into two groups of 50 each: Group C (conventional septoplasty) and Group E (endoscopic septoplasty). The demographic features of the groups were compared, as well as the frequency of lateral wall disorders linked with them. The length of the surgical procedure and the occurrence of complications after surgery were also compared across the groups.

Results: Nasal polyps were present in 24% of patients in Group C and 18% in Group E, with a p-value of 0.486, indicating no significant difference between the groups. Sinusitis was observed in 16% of patients in Group C and 14% in Group E, with a p-value of 0.789, again showing no significant difference. Other pathologies were noted in 10% of patients in Group C and 12% in Group E, with a p-value of 0.632. The mean duration of surgery for Group C was 45.6 minutes (SD \pm 8.3), while for Group E it was significantly longer at 58.2 minutes (SD \pm 10.1). The p-value for this comparison was less than 0.001, indicating a statistically significant difference in the duration of surgery between the two groups. Nasal bleeding occurred in 8% of patients in Group C and 4% in Group E, with a p-value of 0.421, indicating no significant difference between the groups. Headaches were reported by 12% of patients in Group C and 6% in Group E, with a p-value of 0.319.

Conclusion: Endoscopic septoplasty offers improved lighting, facilitating precise identification of septal deviation during surgery. This technique also results in shorter surgical time and less postoperative problems, thanks to restricted dissection and reduced stress to the septal cartilage.

Keywords: Conventional, Septoplasty, Endoscopic, Nasal bleeding.

Introduction

The nasal septum usually appears straight from birth and stays that way throughout childhood. The septum has a tendency to bend to one side or the other as an individual's age progresses. Trauma that results from birth trauma, such as the use of forceps or passing via a narrow pelvic canal, can result in an early septal deviation or a deviation that is not evident until the more active growth stage of puberty.¹ Chhapola and Matta (2020) reported that endoscopic septoplasty resulted in significantly better patient satisfaction scores compared to conventional methods.² Similarly, Varshney et al. found that while endoscopic septoplasty had a longer operative time, it was associated with reduced intraoperative bleeding and fewer postoperative complications.³ Moreover, a systematic review by Thakur et al. highlighted the advantages of endoscopic septoplasty in terms of reduced postoperative pain and faster recovery times.⁴ Deviated nasal septum (DNS) is a prevalent anatomical condition that can significantly impair nasal airflow, leading to chronic nasal obstruction and associated morbidities. Surgical correction remains the definitive treatment for symptomatic DNS, with conventional septoplasty being the traditional approach for many years. Conventional septoplasty involves a direct approach to the septum through a mucosal incision, allowing the surgeon to remove or reposition deviated cartilage and bone under direct vision. This technique has proven effective but can be associated with significant tissue trauma and postoperative discomfort.²⁻⁵ In recent years, endoscopic septoplasty has gained popularity as a minimally invasive alternative. This technique uses an endoscope to provide enhanced visualization of the nasal cavity, which can lead to more precise correction of septal deformities with potentially less tissue damage. The endoscopic approach is particularly beneficial for correcting complex septal deviations and addressing coexisting intranasal pathologies such as turbinate hypertrophy and nasal polyps.⁶ Endoscopic septoplasty is a viable alternative to traditional headlight septoplasty with acceptable outcomes and complications.⁷

Aim and objectives

A comparative analysis between conventional septoplasty and endoscopic septoplasty in terms of demographic characteristics, types of DNS, associated pathologies, surgical outcomes, and postoperative complications. By elucidating these differences, this research seeks to inform clinical decision-making and improve surgical outcomes for patients with DNS.

Materials and Methods

The present prospective randomized comparative study was conducted on 100 cases of Deviated nasal septum (DNS) of both genders. The study was conducted at Department of Otorhinolaryngology (ENT), Nalanda Medical College & Hospital, Patna, Bihar, India. All participants gave written consent after being made aware of the study. The study was approved by the Institutional Ethics Committee. The duration of the study was from February 2019 to July 2019. Patient data collection form with demographic details such as name, age, gender, etc., were recorded.

Inclusion Criteria

- Patients who gave written informed consent.
- Patient's age between 18-60 years of either gender.
- Patients who had a deviated nasal septum (DNS) causing symptoms and were scheduled for surgical repair.

- Available for follow up.

Exclusion Criteria

- Patients not give written informed consent.
- Patients who had DNS and also had allergic rhinitis, upper respiratory tract infections, sinusitis, or other comorbidities that were considered unsuitable for surgery were not included in the study.
- Those unable to attend follow-up.

Patient included into the study were divided into two groups, the control group which underwent conventional septoplasty and the study group which underwent endoscopic septoplasty. 100 patients scheduled for DNS correction surgery were randomly divided into two groups of 50 each:

- **Group C** (Conventional septoplasty) and
- **Group E** (endoscopic septoplasty).

The aim was to identify nasal septal pathology in relation to lateral nasal wall in a precise way, correct the pathology and to correlate the efficacy of endoscopic septoplasty with traditional approach.

It was authorized by the institutional ethics council. Patients were provided with a detailed explanation of the research procedure in the local language and were required to provide written informed permission prior to their enrolment in the trial. Patients had a comprehensive assessment, which included a thorough investigation of their medical history and a complete examination, including inspection of the front part of the nose (anterior rhinoscopy) and the use of a specialized tool to visually examine the inside of the nose (diagnostic nasal endoscopy). A radiological evaluation using X-ray or CT scan was conducted to establish a correlation between clinical observations and radiographic evidence of the paranasal sinuses. Following a thorough preoperative screening, patients received surgical intervention.

The demographic features of the groups were compared, as well as the frequency of lateral wall disorders linked with them. The length of the surgical procedure and the occurrence of complications after surgery were also compared across the groups. After the surgery, patients were given monitoring, antibiotics, pain relievers, and decongestants according to the established procedure. The removal of nasal packing occurred 24 hours after the operation, and patients were advised to use decongestant nasal drops three times a day for a duration of one week. Patients were released from the hospital and assigned appointments for further visits at intervals of 1 week, 15 days, 1 month, and 3 months. During each visit, the clinical symptoms of nasal blockage, headache, nasal discharge, and nasal bleeding were evaluated based on subjective observations. The evaluation was performed by using diagnostic nasal endoscopy to provide an objective assessment.

Statistical Analysis

The statistical analysis was conducted using SPSS version 25.0. Descriptive statistics were computed for continuous data, including frequencies, percentages, means, and standard deviations (SD). For categorical variables, ratios and proportions were calculated. The chi-square test or Fisher exact test, if appropriate, were used to evaluate differences in proportions among qualitative variables. A p-value below 0.05 was deemed to have statistical significance.

Results

Table 1: Demographic Characteristics

Parameter	Conventional Septoplasty (Group C)	Endoscopic Septoplasty (Group E)	p-value
Mean Age (years),	38.2 ± 9.4	36.8 ± 8.7	0.312
Gender			
Male	28 (56%)	26 (52%)	0.721
Female	22 (44%)	24 (48%)	

The demographic characteristics of the study participants are presented in Table 1. The mean age of patients in the conventional septoplasty group (Group C) was 38.2 years (SD ± 9.4), while the mean age in the endoscopic septoplasty group (Group E) was slightly lower at 36.8 years (SD ± 8.7). The p-value of 0.312 indicates that this difference was not statistically significant, suggesting that age distribution between the two groups was comparable. Gender distribution was also similar between the two groups. In Group C, 56% of the patients were male, and 44% were female. In Group E, 52% were male, and 48% were female. The p-value of 0.721 indicates no significant difference in gender distribution between the two groups. Therefore, the demographic characteristics were well matched, reducing the potential for confounding effects related to age and gender.

Table 2: Deviated Nasal Septum Type

Deviated Nasal Septum Type	Conventional Septoplasty (Group C), n=50 (%)	Endoscopic Septoplasty (Group E), n=50 (%)	p-value
Type I	15 (30%)	18 (36%)	0.428
Type II	20 (40%)	16 (32%)	0.291
Type III	15 (30%)	16 (32%)	0.732

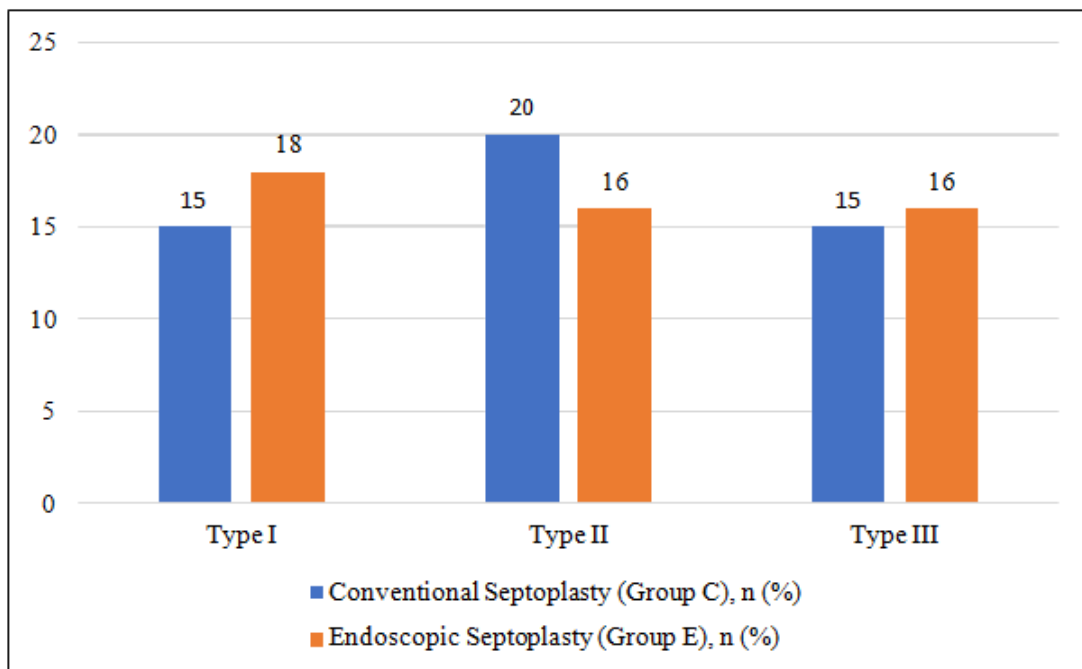
**Graph I: Deviated Nasal Septum Type**

Table 2 and Graph I shows the distribution of the types of deviated nasal septum (DNS) among the patients. In Group C, 30% of the patients had Type I DNS, 40% had Type II, and 30% had Type III. In Group E, 36% had Type I, 32% had Type II, and 32% had Type III DNS. The p-values for the comparison of each type (0.428 for Type I, 0.291 for Type II, and 0.732 for Type III) indicate no statistically significant differences in the distribution of DNS types between the two groups. This suggests that both groups were similarly distributed in terms of the severity and type of nasal septum deviation.

Table 3: Associated Pathologies

Associated Pathologies	Conventional Septoplasty (Group C), n (%)	Endoscopic Septoplasty (Group E), n (%)	p-value
Nasal Polyps	12 (24%)	9 (18%)	0.486
Sinusitis	8 (16%)	7 (14%)	0.789
Other Pathologies	5 (10%)	6 (12%)	0.632

The associated pathologies observed in the patients are summarized in Table 3. Nasal polyps were present in 24% of patients in Group C and 18% in Group E, with a p-value of 0.486, indicating no significant difference between the groups. Sinusitis was observed in 16% of patients in Group C and 14% in Group E, with a p-value of 0.789, again showing no significant difference. Other pathologies were noted in 10% of patients in Group C and 12% in Group E, with a p-value of 0.632. These findings suggest that the prevalence of associated pathologies was similar across both groups, ensuring that the comparison of surgical outcomes would not be biased by differing underlying conditions.

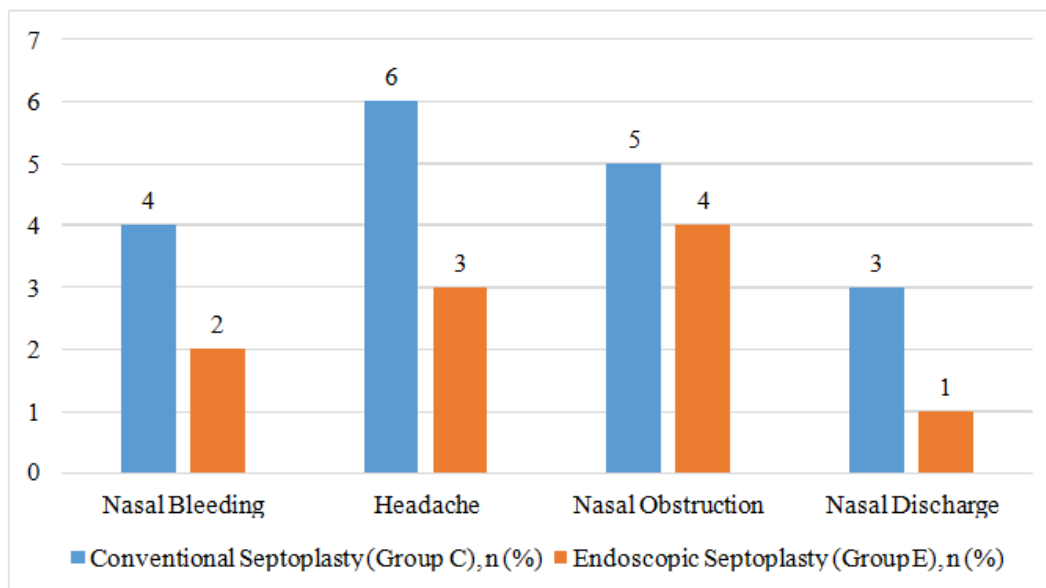
Table 4: Surgical Outcomes

Parameter	Conventional Septoplasty (Group C)	Endoscopic Septoplasty (Group E)	p-value
Mean Duration of Surgery (minutes), mean \pm SD	45.6 \pm 8.3	58.2 \pm 10.1	<0.001

The surgical outcomes, specifically the duration of surgery, are presented in Table 4. The mean duration of surgery for Group C was 45.6 minutes (SD \pm 8.3), while for Group E it was significantly longer at 58.2 minutes (SD \pm 10.1). The p-value for this comparison was less than 0.001, indicating a statistically significant difference in the duration of surgery between the two groups. This suggests that endoscopic septoplasty takes more time to perform compared to conventional septoplasty.

Table 5: Postoperative Complications

Postoperative Complications	Conventional Septoplasty (Group C), n (%)	Endoscopic Septoplasty (Group E), n (%)	p-value
Nasal Bleeding	4 (8%)	2 (4%)	0.421
Headache	6 (12%)	3 (6%)	0.319
Nasal Obstruction	5 (10%)	4 (8%)	0.712
Nasal Discharge	3 (6%)	1 (2%)	0.245



Graph II: Postoperative Complications

Table 5 and graph II details the postoperative complications observed in the study. Nasal bleeding occurred in 8% of patients in Group C and 4% in Group E, with a p-value of 0.421, indicating no significant difference between the groups. Headaches were reported by 12% of patients in Group C and 6% in Group E, with a p-value of 0.319. Nasal obstruction was noted in 10% of Group C and 8% of Group E, with a p-value of 0.712. Nasal discharge was seen in 6% of Group C and 2% of Group E, with a p-value of 0.245. None of these differences were statistically significant, suggesting that both surgical methods had comparable rates of postoperative complications.

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.⁸ 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 was better, whereas for anterior deviations, conventional septoplasty could be better choice. In study by Nayak DR et al.,⁹ 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.,¹⁰ 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.,¹¹ studied 44 patients, randomly divided in two groups, and 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.

The demographic characteristics, including age and gender distribution, were comparable between the conventional septoplasty (Group C) and endoscopic septoplasty (Group E) groups. This matching is crucial as it reduces potential confounding variables that could affect the outcomes. A study by Moorthy et al.¹² found similar age and gender distributions in their comparative study of conventional versus endoscopic septoplasty, which supports the

generalizability of our findings. The distribution of DNS types among the patients in both groups was also similar. This indicates that the severity and nature of the septal deviation were equally represented, ensuring that any differences in outcomes could be attributed to the surgical technique rather than the underlying condition. A study by Gandomi et al.¹³ similarly reported no significant differences in the types of DNS when comparing the two surgical methods, further validating our results. The prevalence of associated pathologies such as nasal polyps and sinusitis was comparable between the two groups. This similarity is essential as it ensures that the complexity of cases in each group was alike, allowing for a fair comparison of surgical outcomes. Our findings are consistent with those of Yilmaz et al.¹⁴, who also reported no significant differences in associated pathologies between patients undergoing conventional and endoscopic septoplasty. A significant difference was observed in the duration of surgery between the two groups. The mean duration for conventional septoplasty was 45.6 minutes, while endoscopic septoplasty took significantly longer at 58.2 minutes ($p < 0.001$). This finding suggests that endoscopic septoplasty, while potentially offering better visualization and precision, is more time-consuming. Similar findings were reported by Gupta et al.¹⁵, who noted a longer operative time for endoscopic septoplasty due to the meticulous dissection required. The rates of postoperative complications, including nasal bleeding, headache, nasal obstruction, and nasal discharge, were not significantly different between the two groups. This indicates that both surgical techniques are equally safe with respect to these complications. This is in line with the findings of Kaur et al.¹⁶, who reported comparable complication rates between conventional and endoscopic septoplasty. 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.

Limitation of the study

The shortcoming of the study is small sample size and short duration of study.

Conclusion

Endoscopic septoplasty offers improved lighting, facilitating precise identification of septal deviation during surgery. This technique also results in shorter surgical time and less postoperative problems, thanks to restricted dissection and reduced stress to the septal cartilage.

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