Original Article

Prospective Study of Open Book Technique of Endoscopic Septoplasty in Deviated Nasal Septum Patients

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Abstract

Background: Deviated nasal septum is a common anatomical abnormality and an important cause of nasal obstruction. Conventional septoplasty performed under headlight illumination may have limitations in visualization, particularly in patients with posterior septal deviations and sharp septal spurs. Endoscopic septoplasty provides improved illumination, magnification and direct visualization of the septal deformity, allowing more precise and targeted correction with limited mucoperichondrial dissection. The open-book technique is an adjunctive endoscopic approach that provides wider exposure of the deviated septal segment and facilitates management of prominent or sharp septal spurs that may be difficult to address by conventional techniques. **Material and Methods:** The present prospective study was conducted in the Department of ENT & Head Neck Surgery, Kalpana Government Medical College, Karnal, Haryana, over a period from 2019 to 2026. Due to non availability of elective patients during COVID 19 pandemics the study was extended. A total of 50 patients aged 18–50 years presenting with symptomatic nasal obstruction associated with deviated nasal septum were included in the study. Patients who underwent endoscopic septoplasty as part of endoscopic sinus surgery were excluded. **Results:** In this study there were 29 male patients (58%) and 21 female patients (42%). Male : Female ratio was 1.4:1. Majority of patients were in age group of 20-30 years. Deviation of nasal septum towards left side was seen in 54% (27 cases), bilateral in 12% (6 cases) and towards right side in 34% (17 cases). Predominant symptom was nasal obstruction (100%) and facial pain/pressure (10%). 13 patient (26%) had mainly cartilaginous deviation while 21 (42%) had cartilaginous and bony deviation and 16 (32%) had cartilage, bony and maxillary crest deviation. Complications with this procedure were minimal due to direct visualization. There were 2 patients with post op synechiae that were released post operative. There were 4 patients who had a 3 mm tear & 2 patients with 2 mm minimal tear on the contralateral mucoperichondrium during the surgery but healed well post operatively when reviewed at 3 month. **Conclusion:** Open book approach for endoscopic septoplasty provides a direct visualization of the nasal cavity with endoscope particularly the posterior sharp septal spur. Endoscopic open-book septoplasty is an adjunct technique to address the sharp septal spur with good outcomes. Hence, incorporation of this technique as a part of the routine endoscopic septoplasty is beneficial for our patients.

Keywords: Deviated nasal septum, Endoscopic septoplasty, Open-book technique, Septal spur.

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Introduction

Deviated nasal septum (DNS) is one of the most common anatomical abnormalities of the nose. Although a minor degree of septal deviation may be asymptomatic, significant deviation can result in functional nasal obstruction and may be associated with symptoms such as epistaxis, headache, facial pain and recurrent sinonasal disease.[1,3] Septoplasty is the surgical procedure performed to correct symptomatic septal deformity and restore adequate nasal airflow.[1]

Conventional septoplasty has traditionally been performed using a headlight for illumination and direct visualization. However, the restricted surgical field, particularly in patients with narrow nasal cavities and posterior septal deformities, may limit visualization and make precise correction difficult.[2,4] Poor visualization may also result in unnecessary mucosal trauma and bleeding.[2]

The introduction of nasal endoscopy has significantly contributed to the development of endoscopic septoplasty.[4] Endoscopic visualization provides magnification and improved illumination of the septum, allowing the surgeon to identify the exact site and extent of the deformity and limit dissection to the pathological area.[4,6] Endoscopic septoplasty has been reported to provide better visualization of posterior septal deformities, reduce the extent of subperichondrial dissection and potentially reduce operative morbidity and postoperative swelling.[4,6] Endoscopy also allows better identification of contact areas and

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facilitates objective assessment of the nasal pathology and postoperative outcome.[5]

Early work on endoscopic septal surgery demonstrated the usefulness of a targeted endoscopic approach for septal spurs.[7] Endoscopic septal spur resection specifically addresses the deviated portion of the septum while minimizing unnecessary dissection, bleeding and postoperative morbidity.[7] Comparative studies have demonstrated that the endoscopic approach can be particularly useful in identifying and relieving contact areas and nasal obstruction, especially in patients with inaccessible posterior septal deviations.[5]

Endoscopic septoplasty has subsequently been described as an alternative to the conventional headlight approach, with advantages including improved visualization, particularly for posterior deformities, limited subperichondrial dissection and reduced postoperative morbidity.[4] Endoscopic septoplasty also provides a direct and targeted route to the anatomical deformity with improved visualization and magnification of the surgical field, facilitating assessment and correction of posterior septal deformities.[6]

The open-book technique of endoscopic septoplasty was developed to improve exposure of the deviated septum.[1] The technique involves making an incision along the prominent portion of the septal deformity and elevating the mucoperichondrial flaps to expose the deviated segment, thereby providing a wider operative field under direct endoscopic visualization.[1] This technique is particularly useful when dealing with prominent or sharp septal spurs where conventional flap elevation may be difficult.[2]

The open-book method provides wide exposure of the septum, improving the precision of correction and potentially reducing complications.[3] The technique has also been described as an adjunct for managing sharp septal spurs, which can pose difficulty during conventional mucoperichondrial flap elevation and may result in mucosal tearing.[2] By providing better access and visualization around the sharp spur, the technique facilitates more controlled correction while preserving the surrounding mucosa.[2]

Thus, the evolution from conventional headlight septoplasty to endoscopic and open-book techniques has aimed to improve visualization, permit more targeted correction of septal deformities and minimize unnecessary tissue trauma.[1,3,4,5,6,7] The open-book technique may be particularly advantageous in patients with sharp posterior septal spurs and other localized deformities where conventional visualization is limited.[2]

The present study was therefore undertaken to evaluate the results and complications of the open-book technique of endoscopic septoplasty in patients with deviated nasal septum, with particular emphasis on postoperative symptomatic improvement and procedure-related complications.

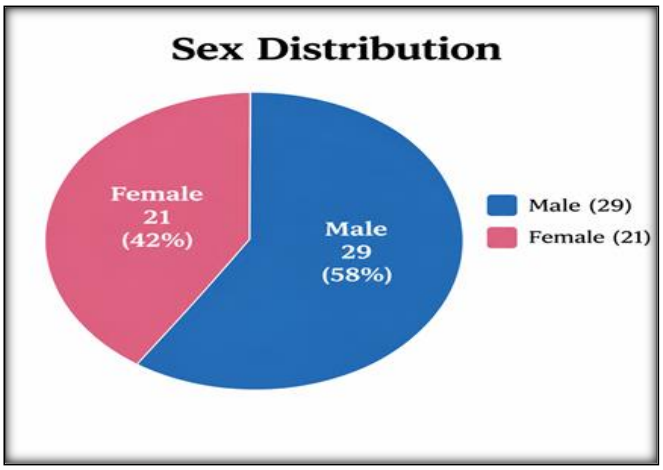
Aim and Objectives: To study the results and complications of open book septoplasty technique in deviated nasal septum patients.

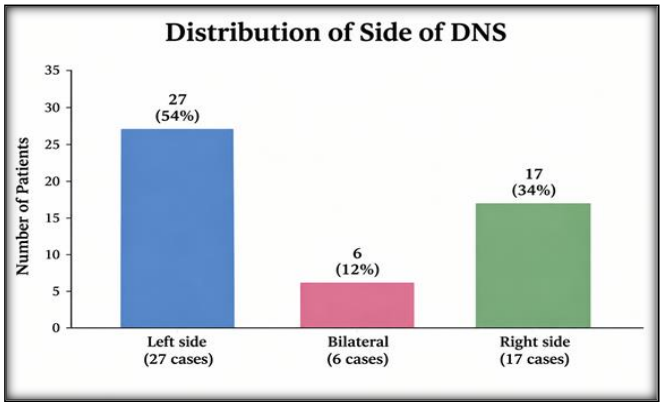
Materials and Methods

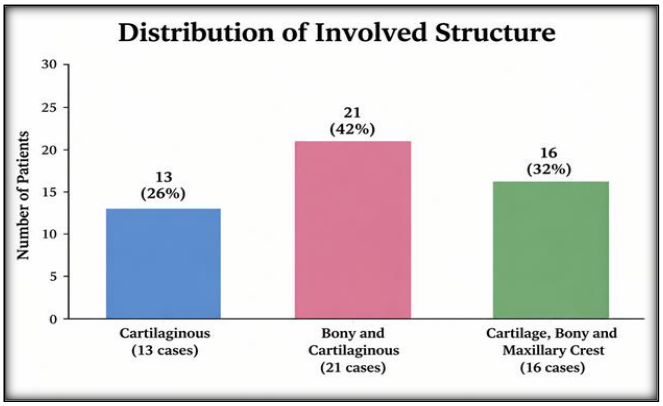
The present prospective study was conducted in the Department of ENT & Head Neck Surgery, Kalpana Government Medical College, Karnal, Haryana, over a period from 2019 to 2026. Due to non availability of elective patients during COVID 19 pandemics the study was extended. A total of 50 patients aged 18–50 years presenting with symptomatic nasal obstruction associated with deviated nasal septum were included in the study. Patients who underwent endoscopic septoplasty as part of endoscopic sinus surgery were excluded. A detailed history was obtained and thorough clinical examination was performed in all patients. Written informed consent was obtained from all participants in their vernacular language.

The patient was positioned and draped in a manner similar to that used for standard endoscopic sinus surgery. The nasal cavity was decongested using patties soaked in Xylocaine 4% followed by re-examination of the nasal cavity using rigid nasal endoscopy to identify the site of septal deformity. Xylocaine 2% with Adrenaline was injected subperichondrially approximately 1 cm anterior to the septal spur along the septum. A standard Freer incision was made, and the mucoperichondrium was elevated under direct visualization using rigid nasal endoscopy. The sharp septal spur was then addressed using the open-book technique. A horizontal incision was made along the sharp border of the spur, and the mucoperichondrial flap was elevated superiorly and inferiorly in an open-book fashion, allowing visualization of the entire deviated segment. The flap on the contralateral side was subsequently elevated, following which the septal spur was excised. The mucoperichondrial flaps were then repositioned and apposed using absorbable 3-0 Vicryl sutures. Conventional nasal packing was performed postoperatively and was removed after 48 hours. The patients were discharged the following day without complications. Postoperative data regarding symptomatic relief and procedure-related complications were recorded during a follow-up period of 3 months. The collected data were statistically analyzed and conclusions were drawn based on the study findings.

Results







Sex distribution

Table 1: Sex distribution.

Sex Distribution	Male	Female
Cases	29	21

In this series there were 29 male patients(58%) and 21 female patients(42%).
Male: Female ratio was 1.4:1.

Age distribution

Majority of patients were in age group of 20-30 years.

Table 2: Age distribution

Age group	Patients
BELOW 20 YEARS	5
21-30 YEARS	25
31-40 YEARS	23
41-50 YEARS	7

Majority of patients were in age group of 20-30 years.

Table 3: Distribution of side of DNS

SIDE of deviation	Right	Left	Bilateral
Percentage	34%	54%	12%

Deviation of nasal septum towards left side was seen in 54% (27 cases), bilateral in 12% (6 cases) and towards right side in 34% (17 cases).

Table 4: Distribution of symptoms

SYMPTOMS	CASES
NASAL DISCHARGE	15
HEADACHE/ FACIAL PAIN	5
NASAL BLOCKAGE	50
EPISTAXIS	4
HYPOSMIA	7

Predominant symptom was nasal obstruction (100%) and facial pain/pressure (10%).

Table 5: Distribution of involved structure

Deviated structure	Cartilaginous	Both	Bony
Cases	26	42	16

13 patient (26%) had mainly cartilaginous deviation while 21 (42%) had cartilaginous and bony deviation and 16 (32%) had cartilage, bony and maxillary crest deviation.

Table 6: Distribution of complications

Complications	Cases
INTRA-OP HEMORRHAGE	4
MUCOSAL TEAR	6
SEPTAL PERFORATION	0
RESIDUAL DEVIATION	0
SYNECHIAE FORMATION	2

Complications with this procedure were minimal due to direct visualization. There were 2 patients with post op synechiae that were released post-operative. There were 4 patients who had a 3 mm tear & 2 patients with 2 mm minimal tear on the contralateral mucoperichondrium during the surgery but healed well post operatively when reviewed at 3 month.

Table 7: Post-operative symptom improvement

Symptoms	Improvement in cases at 3 months post op
NASAL DISCHARGE	13/15(86.7%)
HEADACHE/ FACIAL PAIN	4/5(80%)
NASAL BLOCKAGE	50/50(100%)
EPISTAXIS	4/4(100%)
HYPOSMIA	7/7(100%)

Post op patients were reviewed on 3rd, 7th, 30th day and at 3 month. During each visit patients were asked about their symptoms and were tabulated as follows.

Discussion

Deviated nasal septum is a common anatomical abnormality and is an important cause of nasal obstruction. Septoplasty remains the definitive surgical treatment for patients with symptomatic septal deviation. The present study evaluated the results and complications of the open-book technique of endoscopic septoplasty in 50 patients with symptomatic nasal obstruction and deviated nasal septum. The study demonstrated improvement in postoperative symptoms with a low incidence of complications during the 3-month follow-up period.

In the present study, nasal obstruction was the predominant presenting symptom and was reported by all 50 patients. This finding is consistent with the established role of septal deviation as an important structural cause of nasal obstruction. Endoscopic assessment allows accurate identification of the site and extent of the septal deformity and provides better visualization of areas that may be difficult to assess using conventional techniques. Comparative evaluation of endoscopic and traditional septoplasty has also demonstrated better identification and relief of contact areas and nasal obstruction with the endoscopic approach, particularly in patients with posterior septal deviations.[5]

The major advantage of endoscopic septoplasty is improved illumination and magnification of the operative field. Conventional headlight septoplasty may provide a restricted view, particularly in a narrow nasal cavity and in the presence of posterior septal deformities. Limited visualization may increase the possibility of unnecessary mucosal dissection and trauma. Endoscopic septoplasty allows the surgeon to directly visualize the deformity and restrict dissection to the area requiring correction, thereby facilitating a more targeted surgical approach.[4,6]

The open-book technique provides an additional advantage in the management of prominent and sharp septal spurs. A sharp spur can make elevation of the mucoperichondrial flap difficult and may result in mucosal tearing during conventional flap elevation. The open-book approach provides wider exposure of the deviated segment by making a horizontal incision along the prominent border of the spur and elevating the mucoperichondrial flap superiorly and inferiorly. This allows direct visualization of the entire deviated area and facilitates controlled removal of the spur.[1,2,3]

The present study particularly supports the usefulness of this technique for localized septal deformities and sharp spurs. The wider operative exposure provided by the open-book approach allows the surgeon to identify the exact extent of the deformity before excision. This targeted approach may also help in avoiding unnecessary manipulation of the surrounding septal mucosa. Previous reports have similarly emphasized that the open-book technique provides a wide area of septal exposure and facilitates correction of the deviated segment while potentially reducing complications.[1,3]

In the present study, intraoperative mucosal injury was observed in 6 patients. Four patients had a 3-mm mucosal tear, while two patients had a minimal 2-mm contralateral mucoperichondrial tear. These tears healed during the follow-up period. The occurrence of minor mucosal tears is an important consideration when dealing with sharp septal spurs, as the sharp bony or cartilaginous prominence can make flap elevation technically challenging. The open-book approach is intended to overcome this difficulty by providing better access to the spur and reducing the need for forceful flap elevation around the sharp edge.[2]

No patient in the present study developed septal perforation or residual septal deviation during the 3-month follow-up period. Similarly, no major postoperative complication was observed. These findings are consistent with the reported advantages of targeted endoscopic septal surgery, in which limited dissection and improved visualization may help reduce unnecessary tissue trauma and postoperative morbidity.[4,6,7] Previous experience with the open-book approach has also reported healing of mucoperichondrial tears without significant long-term complications.[1]

Synechiae were observed in 2 patients in the present study. Although synechiae are a recognized complication following nasal surgery, their occurrence was limited in the present series. Careful mucosal handling, adequate visualization and appropriate repositioning of the mucoperichondrial flaps may help minimize postoperative adhesions.

Symptomatic improvement was observed across all assessed symptoms at 3 months. Nasal blockage showed complete improvement in all 50 patients. Improvement was also observed in nasal discharge, headache or facial pain, epistaxis and hyposmia. The improvement in nasal obstruction is particularly relevant because relief of obstructive symptoms represents the principal functional objective of septal surgery. The ability of

endoscopic techniques to accurately identify and correct the anatomical site responsible for obstruction may contribute to these favorableoutcomes.[5,6]

The findings of the present study are also in agreement with the concept of targeted endoscopic septal surgery, in which only the pathological portion of the septum is addressed. Endoscopic septal spur resection has been described as a focused approach that can minimize unnecessary dissection and perioperative morbidity.[7] Similarly, endoscopic septoplasty provides improved visualization and magnification while allowing assessment of posterior septal deformities and associated nasal structures.[4,6]

The open-book technique therefore appears to be particularly useful as an adjunct to endoscopic septoplasty rather than as a replacement for all conventional septoplasty techniques. Its major value lies in providing additional exposure when a sharp or prominent septal spur makes conventional flap elevation difficult. The technique allows the surgeon to directly visualize the deformity, obtain adequate access for excision and subsequently reposition the mucoperichondrial flaps.[1,2,3]

Overall, the present study demonstrates that the open-book technique of endoscopic septoplasty is associated with good symptomatic outcomes and a low incidence of significant complications. The technique provides improved visualization and wider access to difficult septal deformities, particularly sharp septal spurs, while allowing targeted correction with limited tissue manipulation. These findings support the use of the open-book approach as a useful adjunct in endoscopic septoplasty, especially in cases where conventional visualization and access are inadequate.

Conclusion

Open book approach for endoscopic septoplasty provides a direct visualization of the nasal cavity with endoscope particularly the posterior sharp septal spur.

The traditional septoplasty technique involves headlight for illumination and visualization which is associated with limited surgical views of the narrow nose particularly posterior deviations due to the limited space which leads to trauma and bleeding.

Endoscopic open-book septoplasty is an adjunct technique to address the sharp septal spur with good outcomes. Hence, incorporation of this technique as a part of the routine endoscopic septoplasty is beneficial for our patients.

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Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Prepageran N, Lingham OR. Endoscopic septoplasty: the open book method. Indian J Otolaryngol Head Neck Surg. 2010;62(3):310-312.
2. Nadarajah D, Saniasiaya J, Sutikno B, Roldan R, Abdullah B. Endoscopic open book septoplasty as an adjunct technique in addressing sharp septal spur. Pan Arab J Rhinol. 2018;8.
3. Budiman BJ, Pulungan MR. Penatalaksanaandeviasi septum denganseptoplastiendoskopikmetode open book. Oto Rhino LaryngologicaIndonesiana. 2012;42(1).
4. Hwang PH, McLaughlin RB, Lanza DC, Kennedy DW. Endoscopic septoplasty: indications, technique, and results.Otolaryngol Head Neck Surg. 1999;120(5):678-682.
5. Lanza DC, Rosin DF, Kennedy DW. Endoscopic septal spur resection. Am J Rhinol. 1993;7(5):213-216.
6. Nayak DR, Balakrishnan R, Murthy KD. An endoscopic approach to the deviated nasal septum—a preliminary study. J Laryngol Otol. 1998;112(10):934-939.
7. Durr DG. Endoscopic septoplasty: technique and outcomes. J Otolaryngol. 2003;32(1):6-11.