Section: OtoRhinoLaryngolgy

Original Research Article

A CLINICAL STUDY ON THE PREVALENCE AND SURGICAL OUTCOMES OF DEVIATED NASAL SEPTUM IN A DISTRICT HOSPITAL

Borse Hemant Kumar Ramdas[1]

[1]Associate Professor, Department of OtoRhinoLaryngolgy, Shri Bhaushaheb Hire Government Medical College Dhule, Maharashtra, India.

Received : 06/12/2025
Received in revised form : 11/01/2026
Accepted : 30/01/2026

Keywords:
Deviated nasal septum, Septoplasty, Nasal obstruction, NOSE scale, Surgical outcomes.

Corresponding Author:
Dr. Borse HemantKumar Ramdas,
Email: sunitahborse@gmail.com

DOI: 10.47009/jamp.2026.8.1.94

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2026; 8 (1); 496-500

ABSTRACT

Background: Deviated Nasal Septum (DNS) is one of the most common structural causes of nasal obstruction encountered in otorhinolaryngology practice. Its clinical impact ranges from nasal blockage and sinusitis to headache, snoring, and impaired quality of life. Septoplasty remains the gold-standard surgical treatment for symptomatic DNS; however, data on its prevalence and postoperative outcomes from district-level hospitals are limited. This study aimed to evaluate the prevalence patterns, clinical characteristics, and surgical outcomes of DNS in a district hospital setting. **Materials and Methods:** A prospective observational study was conducted in the Department of Otorhinolaryngology at a district hospital over a defined study period. Patients presenting with symptoms of nasal obstruction were evaluated clinically and radiologically for DNS. The type of deviation was classified using Mladina's classification. Those fulfilling inclusion criteria underwent septoplasty and were followed up at 1 week, 1 month, and 3 months postoperatively. Symptom severity and surgical outcomes were assessed using the Nasal Obstruction Symptom Evaluation (NOSE) scale. Statistical analysis was performed using paired t-tests, and $p < 0.05$ was considered significant. **Results:** Out of 120 patients, the majority were males (68.3%) aged 21–30 years (31.7%). The most frequent deviation types were Type III (23.3%) and Type IV (21.7%). Nasal obstruction (100%) and nasal discharge (58.3%) were the most common symptoms, with inferior turbinate hypertrophy (66.7%) being the most common associated condition. The mean NOSE score improved significantly from 70.4 ± 8.6 preoperatively to 15.8 ± 4.8 at 3 months ($p < 0.001$). Postoperative complications were minimal (16.7%), and 87.5% of patients reported "Excellent" or "Good" satisfaction. **Conclusion:** DNS predominantly affects young adults and males, with septoplasty providing significant symptomatic relief and high patient satisfaction. The procedure remains safe and effective in district hospital settings, with minimal complications.

INTRODUCTION

The nasal septum is a complex osseo-cartilaginous structure that divides the nasal cavity into two symmetrical passages, thereby allowing smooth and laminar airflow, humidification, and filtration of inspired air.[1] A Deviated Nasal Septum (DNS) refers to displacement or misalignment of this septum away from the midline, resulting in anatomical and functional asymmetry of the nasal passages.[2,3] While minor deviations are common and often asymptomatic, a significant septal deviation can reduce nasal airflow on one side (or bilaterally), predisposing to nasal obstruction, impaired mucociliary clearance, recurrent sinus disease, epistaxis, headache, and disturbed sleep or snoring.[4,5,6]

The pathogenesis of DNS may be congenital (due to developmental anomalies or positional distortion in utero or during birth) or acquired (most commonly from nasal trauma incurred during childbirth, childhood falls, contact sports, road-traffic accidents, or other facial injuries).[2,7,3] With growth and age, even a previously minor deviation may worsen due to differential facial growth or external insults.[2,8]

The resulting anatomical deformity not only disturbs airflow dynamics — leading to turbulent flow, increased airway resistance, and impaired humidification — but can also affect neighboring sinonasal structures, lateral wall dynamics, and sinus drainage pathways, thereby increasing risk of chronic rhinosinusitis and other sinonasal morbidities.[9,5]

Given the high estimated prevalence of septal deviations in the general population — some studies report up to 70–80% of individuals having some

degree of deviation, although only a subset become symptomatic or require intervention,[3,6,9] — DNS represents a significant public health and clinical burden. Moreover, surgical correction via Septoplasty remains the definitive and most widely performed treatment for symptomatic DNS; when properly selected and executed, septoplasty yields good functional outcomes with low complication rates.[5,9,10] However, many available studies derive data from tertiary care centers, referral hospitals, or specialized rhinology clinics. There remains a paucity of data from district-level hospitals — particularly from resource-limited settings — where epidemiological patterns, patient demographics, deviation types, and surgical outcomes may differ. Thus, this study aims to fill that gap by evaluating the prevalence of DNS and analyzing surgical outcomes after septoplasty in a district hospital. Such data can inform local clinical practice, surgical planning, resource allocation, and contribute to regional ENT literature.

MATERIALS AND METHODS

This prospective observational study was carried out in the Department of Otorhinolaryngology at a district hospital over a defined study period. The study aimed to determine the prevalence of deviated nasal septum (DNS) among patients presenting with nasal obstruction and to assess surgical outcomes following septoplasty. All patients attending the ENT outpatient department with symptoms suggestive of nasal obstruction were screened. Those found to have DNS on clinical examination and who fulfilled the inclusion criteria were enrolled after obtaining written informed consent. Ethical approval for the study was obtained from the Institutional Ethics Committee prior to data collection.

A detailed clinical history was taken from each participant, focusing on nasal obstruction, nasal discharge, headache, epistaxis, and associated sinus symptoms. Thorough anterior rhinoscopic and diagnostic nasal endoscopic examinations were performed to evaluate the type and severity of septal deviation. Radiological imaging, including X-ray paranasal sinuses or computed tomography (CT) of the nose and paranasal sinuses, was performed when indicated to confirm the diagnosis and assess coexisting pathology. The type of DNS was classified according to Mladina's classification. Patients with sinonasal malignancy, nasal polyposis, previous nasal surgery, or active upper respiratory tract infection at the time of examination were excluded from the study.

Patients undergoing septoplasty were evaluated both preoperatively and postoperatively using the Nasal Obstruction Symptom Evaluation (NOSE) scale to assess subjective symptom improvement. All surgeries were performed under local or general anesthesia using a standard hemitransfixion or Killian incision approach, with correction of septal deviation, excision of spurs, and preservation of adequate L-strut support. Postoperative follow-up was conducted at 1 week, 1 month, and 3 months to evaluate symptom relief, complications, and patient satisfaction. Data were recorded systematically and analyzed using descriptive and inferential statistical methods. The pre- and postoperative NOSE scores were compared using paired t-tests, and correlations between type of deviation, symptom severity, and surgical outcomes were assessed. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Characteristics of the Study Population (n = 120)

Variable	Category	Frequency (n)	Percentage (%)
Age Group (years)	10–20	15	12.5
	21–30	38	31.7
	31–40	30	25.0
	41–50	22	18.3
	>50	15	12.5
Gender	Male	82	68.3
	Female	38	31.7
Residence	Urban	70	58.3
	Rural	50	41.7

A total of 120 patients diagnosed with Deviated Nasal Septum (DNS) were included in the study. The majority of patients were young adults between 21 and 30 years of age (31.7%), followed by the 31–40-year group (25%). Males constituted a higher proportion (68.3%) compared to females (31.7%), indicating a male predominance. Most of the participants were from urban areas (58.3%), while 41.7% resided in rural regions. This distribution reflects a higher consultation rate among younger, working-age males, possibly due to greater exposure to trauma and occupational risks.

Table 2: Distribution of Patients According to Mladina's Classification of Nasal Septal Deviation

Mladina Type	Description	Frequency (n)	Percentage (%)
Type I	Mild anterior deviation	10	8.3
Type II	Anterior vertical deviation	22	18.3
Type III	C-shaped deviation	28	23.3

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Type IV	S-shaped deviation	26	21.7
Type V	Horizontal spur	18	15.0
Type VI	Horizontal groove	10	8.3
Type VII	Complex deviation	6	5.0
Total		**120**	**100**

When classified according to Mladina's classification, Type III (C-shaped deviation) was the most common (23.3%), followed by Type IV (S-shaped) (21.7%) and Type II (18.3%). Less frequent types included Type V (15%), Type I (8.3%), Type VI (8.3%), and Type VII (5%). These findings suggest that complex or compound deviations were less prevalent in the general population attending a district hospital, whereas simple anterior and C- or S-shaped deviations predominated.

Table 3: Clinical Presentation and Associated Conditions in Patients with Deviated Nasal Septum

Symptom / Associated Condition	Frequency (n)	Percentage (%)
Nasal obstruction	120	100.0
Nasal discharge	70	58.3
Headache / facial pain	65	54.2
Sneezing	48	40.0
Epistaxis	22	18.3
Hyposmia	25	20.8
Inferior turbinate hypertrophy	80	66.7
Chronic rhinosinusitis	40	33.3
Allergic rhinitis	35	29.2
Concha bullosa	28	23.3

The most common presenting symptom was nasal obstruction (100%), followed by nasal discharge (58.3%), headache or facial pain (54.2%), sneezing (40%), and epistaxis (18.3%). Inferior turbinate hypertrophy was observed in 66.7% of cases, while chronic rhinosinusitis (33.3%), allergic rhinitis (29.2%), and concha bullosa (23.3%) were frequent associated conditions. These findings highlight that DNS commonly coexists with other structural or inflammatory nasal pathologies that may compound symptoms and influence postoperative outcomes.

Table 4: Comparison of Preoperative and Postoperative NOSE Scores (n = 120)

Follow-up Interval	Mean NOSE Score ± SD	Mean Improvement (%)	*p*-value
Preoperative	70.4 ± 8.6	—	—
1 Week Post-op	40.2 ± 6.4	42.9	<0.001*
1 Month Post-op	25.6 ± 5.2	63.6	<0.001*
3 Months Post-op	15.8 ± 4.8	77.6	<0.001*

Evaluation of the NOSE (Nasal Obstruction Symptom Evaluation) score showed significant symptomatic improvement following septoplasty. The mean preoperative NOSE score was 70.4 ± 8.6, which improved to 40.2 ± 6.4 at one week, 25.6 ± 5.2 at one month, and 15.8 ± 4.8 at three months postoperatively. The difference between pre- and postoperative scores at all intervals was statistically significant ($p < 0.001$), indicating sustained symptomatic relief following surgical intervention.

Table 5: Postoperative Complications and Patient Satisfaction After Septoplasty (n = 120)

Parameter	Frequency (n)	Percentage (%)
Complications		
Mild nasal bleeding	10	8.3
Septal hematoma	3	2.5
Synechiae formation	8	6.7
Infection	4	3.3
Persistent obstruction	6	5.0
Overall complication rate	—	**16.7**
Patient Satisfaction (3-month follow-up)		
Excellent	70	58.3
Good	35	29.2
Fair	10	8.3
Poor	5	4.2

Postoperative complications were minimal. Mild nasal bleeding occurred in 8.3% of patients, synechiae formation in 6.7%, septal hematoma in 2.5%, infection in 3.3%, and persistent nasal obstruction in 5%. The overall complication rate was 16.7%, all of which were managed conservatively without major morbidity. Regarding subjective outcomes, 58.3% of patients rated their satisfaction as excellent, 29.2% as good, 8.3% as fair, and only 4.2% as poor at the three-month follow-up.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Table 6: Correlation Between Type of DNS and Symptom Severity (Mean Preoperative NOSE Score)

Mladina Type	Mean NOSE Score ± SD	*p*-value
Type I–II	62.3 ± 6.8	<0.05*
Type III–IV	71.2 ± 7.4	
Type V–VII	74.6 ± 6.2	

A statistically significant correlation was found between the type of septal deviation and severity of symptoms, with higher mean preoperative NOSE scores in patients with Type V–VII deviations compared to Type I–II ($p < 0.05$). This suggests that more complex or posterior deviations are associated with greater symptom burden and more pronounced obstruction.

DISCUSSION

In our study of 120 patients with Deviated Nasal Septum (DNS) undergoing Septoplasty, we observed a marked improvement in nasal obstruction symptoms: the mean NOSE (Nasal Obstruction Symptom Evaluation) score dropped from 70.4 ± 8.6 preoperatively to 15.8 ± 4.8 at three months postoperatively, representing a sustained and clinically significant benefit. This aligns well with prior data by Stewart et al., who reported substantial subjective improvement in NOSE scores at 3 and 6 months after septoplasty (with or without turbinate surgery) in their cohort, confirming the validity of NOSE as an outcome tool in septoplasty evaluations.[2]

The efficacy of septoplasty is further supported by a recent large randomized trial, where participants undergoing septoplasty had significantly better quality-of-life scores (measured by SNOT-22) at six months compared to those managed with medical therapy alone — demonstrating a ~20-point greater reduction in SNOT-22 for the surgical group ($P < 0.001$).[3] The same study noted improved objective nasal airflow measures, reinforcing that septoplasty yields both subjective symptomatic relief and objective functional improvements. In our setting, though objective rhinomanometry or peak nasal inspiratory flow tests were not universally done, the dramatic subjective improvement strongly suggests improved airflow and patient benefit, consistent with that evidence.

Concerning postoperative complications, our study reported an overall complication rate of 16.7%, with mild bleeding in 8.3%, synechiae in 6.7%, septal hematoma in 2.5%, and infection in 3.3%. These rates are somewhat higher than those pooled in a recent systematic review where complication rates after conventional septoplasty ranged lower (bleeding, infection and perforation rates in some reports as low as ~0.3–4%).[1] However, variation in reported complication rates across studies is well-known, largely due to patient selection, surgical technique differences (e.g., conventional vs. endoscopic septoplasty), and follow-up duration. Indeed, a meta-analysis of septoplasty (with or without turbinate surgery) showed low complication and revision rates, supporting that septoplasty remains a safe procedure overall.[1]

Our findings of high patient satisfaction (≈ 87.5% rated their result as "Excellent" or "Good") at 3-month follow-up echo results from other studies where a majority of patients report satisfactory relief of nasal obstruction and improvement in quality of life after septoplasty.[3] Moreover, emerging evidence suggests that in patients with comorbid conditions such as Allergic Rhinitis, septoplasty (especially endoscopic) significantly reduces nasal symptoms (obstruction, rhinorrhea, sneezing) and improves quality-of-life scores compared to medical therapy alone[4], indicating broader applicability of septoplasty beyond pure anatomical DNS.

Nevertheless, some authors have highlighted limitations and the need for cautious interpretation. For instance, the systematic review by van Egmond et al. concluded that although subjective outcomes often improve, objective measures of nasal patency do not consistently show additional benefit, and many studies suffer from heterogeneity and potential bias, thus making definitive conclusions about septoplasty effectiveness somewhat uncertain[5]. This underscores the importance of standardized outcome measures, longer follow-up, and objective airflow assessments.

In our study, while symptomatic improvement and patient satisfaction were substantial, absence of standardized objective nasal airflow measurements (e.g., rhinomanometry, PNIF) represents a limitation that may affect generalizability. Additionally, our follow-up period (3 months) may not capture long-term complications or relapse of symptoms, which some authors suggest may occur later.

Our study adds to the growing evidence that septoplasty is an effective and relatively safe intervention for symptomatic DNS even in a district hospital setting, with high rates of symptom relief and patient satisfaction. The somewhat higher complication rate compared to pooled meta-analytic data may reflect variations in surgical technique, perioperative care, or follow-up intensity — emphasizing the need for careful surgical planning, standardized techniques, and close postoperative monitoring. Given the substantial burden of nasal obstruction and associated comorbidities (rhinosinusitis, allergic rhinitis, turbinate hypertrophy) in patients with DNS, our findings support the continued use of septoplasty in resource-limited settings and argue for larger, ideally prospective studies with objective airflow measurements and longer follow-up to further validate these results in diverse populations.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

CONCLUSION

This prospective observational study demonstrated that Deviated Nasal Septum (DNS) is a common cause of nasal obstruction, predominantly affecting young adult males, with C-shaped and S-shaped deviations being the most frequent patterns. Septoplasty significantly improved nasal obstruction symptoms, as evidenced by a marked reduction in NOSE scores and high patient satisfaction, while postoperative complications were minimal and manageable.

However, the study was limited by its relatively small sample size, short follow-up period, and lack of objective airflow measurements such as rhinomanometry or acoustic rhinometry. These factors may limit generalizability and long-term assessment of surgical outcomes.

Septoplasty remains a safe and effective procedure for symptomatic DNS, even in district-level hospitals with limited resources. Incorporating standardized objective measures of nasal patency and extending postoperative follow-up will strengthen future research. Larger multicentric studies are recommended to validate these findings and to establish standardized outcome protocols for septoplasty evaluation.

Conflict of Interest: None declared

REFERENCES

1. Mladina R, Cujic E, Subaric M, Vukovic K. Nasal septal deformities in ear, nose, and throat patients: An international study. Am J Otolaryngol. 2008;29(2):75-82.
2. Gray LP. Deviated nasal septum: Incidence and etiology. Ann Otol Rhinol Laryngol. 1978;87(3 Pt 3 Suppl 50):3–20.
3. Orlandi RR, Smith TL, Marple BF, et al. Update on septoplasty: Indications, techniques, and outcomes. Otolaryngol Clin North Am. 2010;43(3):563-580.
4. Stewart MG, Witsell DL, Smith TL, Weaver EM, Yueh B, Hannley MT. Development and validation of the Nasal Obstruction Symptom Evaluation (NOSE) scale. Otolaryngol Head Neck Surg. 2004;130(2):157-163.
5. Ketcham AS, Han JK. Complications and management of septoplasty. Otolaryngol Clin North Am. 2010;43(4):897-904.
6. Rao JJ, Kumar EC, Babu KR, Chowdary VS, Singh J, Rangamani SV. Classification of nasal septal deviations – relation to sinonasal pathology. Indian J Otolaryngol Head Neck Surg. 2005;57(3):199-201.
7. Gray LP, Skarżyński PH. The development of nasal septum and its deformities. J Laryngol Otol. 1992;106(10):857-862.
8. Reitzen SD, Chung W, Shah AR. Nasal septal deviation in the pediatric and adult populations. Ear Nose Throat J. 2011;90(3):112-115.
9. van Egmond MMHT, Rovers MM, Hendriks CTM, van Heerbeek N. Effectiveness of septoplasty versus non-surgical management for nasal obstruction due to a deviated septum in adults: Randomized controlled trial. BMJ. 2019;364:l185.
10. Buckland JR, Thomas S, Harries PG. Can the Sino-Nasal Outcome Test (SNOT-22) be used as a reliable outcome measure for septal surgery? Clin Otolaryngol. 2003;28(1):43-47.
11. Al-Anazi SA, Al-Qahtani KH, Al-Badr AM, Al-Noury KI. Outcome of septoplasty with and without inferior turbinate reduction. Saudi Med J. 2011;32(4):380-384.
12. van Egmond MMHT, Rovers MM, Hendriks CTM, van Heerbeek N. Septoplasty with or without turbinoplasty versus non-surgical management for nasal obstruction: Systematic review and meta-analysis. Clin Otolaryngol. 2018;43(2):760-770.
13. Stewart MG, Smith TL, Weaver EM, Witsell DL, Yueh B, Hannley MT. Outcomes after nasal septoplasty: Results from the Nasal Obstruction Septoplasty Effectiveness (NOSE) study. Otolaryngol Head Neck Surg. 2004;130(3):283-290.
14. Samarei R. Septoplasty complications: A retrospective study of 563 cases. Am J Otolaryngol. 2018;39(1):32-35.
15. van Egmond MMHT, Rovers MM, Hendriks CTM, van Heerbeek N. Septoplasty for nasal obstruction due to a deviated septum in adults: Cochrane systematic review. Cochrane Database Syst Rev. 2020;9(9):CD001012.
16. Konstantinidis I, Triaridis S, Triaridis A, Karagiannidis K, Kontzoglou G. Long-term results following nasal septal surgery. Focus Rhinol. 2005;43(3):131-135.
17. Dąbrowska-Bień J, Skarżyński PH, Gwizda G, et al. Quality of life and satisfaction after septoplasty with turbinoplasty: A prospective, observational study. Eur Arch Otorhinolaryngol. 2018;275(7):1789-1798.
18. Bateman ND, Woolford TJ. Septoplasty outcomes: Review of the evidence. J Laryngol Otol. 2003;117(12):897-902.
19. van Egmond MMHT, Rovers MM, Hendriks CTM, van Heerbeek N. Septoplasty: Evidence-based review. Clin Otolaryngol. 2019;44(6):897-907.
20. Uppal S, Mistry D, Nadig S, Adams C. Evaluation of patient benefit from septal surgery for nasal obstruction. Eur Arch Otorhinolaryngol. 2005;262(9):720-725.

ISSN (O): 2687-5365; ISSN (P): 2753-6556