

ROLE OF SEPTAL CORRECTION IN ALLERGIC RHINITIS WITH DNS-A PROSPECTIVE STUDY IN A TERTIARY CARE CENTRE

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ABSTRACT

Background: Allergic rhinitis with deviated nasal septum (DNS) commonly presents with persistent nasal obstruction despite optimal medical therapy. Septal correction may improve nasal patency and enhance overall symptom control. **Aim:** To evaluate the role of septal correction in patients with allergic rhinitis and deviated nasal septum attending a tertiary care centre. **Materials and Methods:** This prospective interventional study included 40 adult patients with allergic rhinitis and DNS. Baseline demographic and clinical characteristics were recorded, followed by nasal endoscopic evaluation. Patients underwent septal correction and were assessed preoperatively and at 1 and 3 months postoperatively using the Nasal Obstruction Symptom Evaluation (NOSE) score and Allergic Rhinitis Control Test (ARCT) score. Postoperative symptom relief was also evaluated. Statistical significance was considered at $p < 0.05$. **Results:** The mean age was 32.85 ± 10.75 years, with most patients aged 21–30 years (42.5%). Sneezing (100%) and nasal obstruction (92.5%) were the most common presenting symptoms, while persistent allergic rhinitis was observed in 52.5% of patients. DNS to Left side was present in 55% of cases. The mean NOSE score significantly decreased from 14.30 ± 3.16 preoperatively to 7.28 ± 2.26 at 3 months ($p < 0.001$). Similarly, the mean ARCT score improved from 11.57 ± 3.20 to 17.88 ± 3.20 ($p < 0.001$). Maximum postoperative relief was observed for nasal obstruction (97.3%), followed by headache (92.3%) and anosmia (83.3%). **Conclusion:** Septal correction significantly improves nasal obstruction, enhances allergic rhinitis control, and provides substantial symptomatic relief in patients with allergic rhinitis and DNS. It should be considered an effective adjunct to medical therapy in carefully selected patients with clinically significant septal deviation.

KEYWORDS

Allergic Rhinitis, Deviated Nasal Septum, Septoplasty, Nasal Obstruction, NOSE Score, ARCT Score.

INTRODUCTION

Allergic rhinitis is a common IgE-mediated hypersensitivity disorder that significantly impairs quality of life through symptoms such as nasal obstruction, sneezing, rhinorrhoea, and impaired well-being. Although allergic inflammation is the primary pathology, structural abnormalities of the nasal cavity, particularly a deviated nasal septum (DNS), substantially influence symptom severity and treatment outcomes. Septal correction, therefore, represents a functional intervention aimed at restoring normal nasal physiology in patients with coexisting allergic inflammation and mechanical obstruction. [1,2]

A deviated nasal septum alters nasal airflow dynamics, impairs mucociliary clearance, and reduces humidification and air conditioning. In patients with allergic rhinitis, these structural changes exacerbate mucosal inflammation, increase airflow turbulence, promote allergen deposition, and contribute to persistent nasal obstruction, poor response to intranasal therapy, and recurrent sinonasal symptoms. [3,4]

Although antihistamines, intranasal corticosteroids, and allergen avoidance remain the cornerstone of treatment, a subset of patients continues to experience persistent symptoms despite optimal medical therapy. In such patients, DNS may limit effective drug delivery and perpetuate mucosal irritation, making septal correction a valuable adjunct that improves nasal patency and enhances the effectiveness of medical management rather than treating the underlying allergy itself. [5]

Even minor septal deviations can produce compensatory turbinate hypertrophy, further compromising the nasal airway, particularly in individuals with chronic allergic inflammation. Septoplasty restores balanced airflow, improves nasal physiology, and has been associated with better symptom relief, improved sleep, and enhanced quality of life, although it does not eliminate the underlying allergic predisposition. [6–8]

Septal correction should be considered in patients with anatomical obstruction after appropriate clinical and endoscopic evaluation. Current management emphasizes integrating surgical correction with medical therapy to address both structural and inflammatory

components, thereby achieving better symptom control and functional outcomes. [9,10]

The present study was undertaken to evaluate the role of septal correction in patients with allergic rhinitis and deviated nasal septum attending a tertiary care centre.

MATERIALS AND METHODS

The prospective study was conducted in the Department of E.N.T at tertiary care centre in Central India, for a period of 2 years after receiving approval from the institutional ethics committee. 40 patients were selected for the study based on the fulfilment of the inclusion/exclusion criteria.

Inclusion Criteria

Patients age more than 18 years having moderate to severe type of allergic rhinitis with deviated nasal septum, willing to provide written informed consent.

Exclusion Criteria

Patients with mild symptoms of NOSE score (0-5) and unfit/unwilling for surgery.

The study procedure began with a detailed history taking and clinical examination of all patients presenting to the ENT OPD with nasal complaints. A general physical examination was performed, followed by a local examination of the nose using anterior rhinoscopy. All subjects then underwent diagnostic nasal endoscopy using 0° endoscope to precisely evaluate the nasal anatomy, confirm the side and degree of septal deviation, and assess the nasal mucosa and osteomeatal complex. Routine blood investigations were performed, including complete blood count (CBC) and absolute eosinophilic count (AEC). Patients who met the inclusion criteria and provided written informed consent were enrolled. Preoperatively, the severity of nasal obstruction was assessed using the NOSE scale, and the control of allergic rhinitis was assessed using the ARCT. All enrolled patients then underwent septal correction surgery under all aseptic precautions after obtaining preoperative fitness. Postoperatively, patients were followed up at two time points: first at the end of one month and again at the end of three months after surgery. At each of these follow-up visits, the NOSE score and ARCT score were re-administered to the same patients. Data regarding any ongoing medication use, including

nasal sprays, was also recorded.

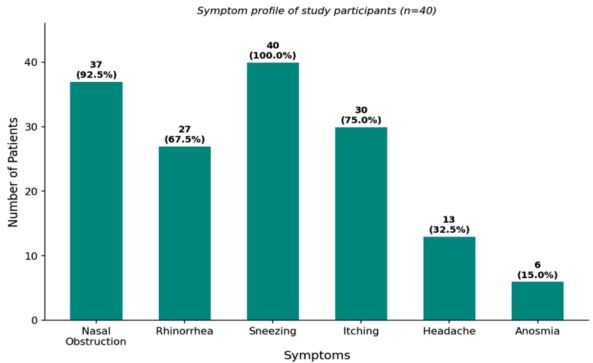
Data were collected using a structured case Performa. Descriptive statistics were used to report frequencies and percentages for categorical variables.

RESULT

The mean age of the patients was 32.85 ± 10.75 years (range: 18–58 years), with the majority belonging to the 21–30 years age group 17(42.5%). 11(27.5%) where in the age group of 31–40years, 7(17.5%) 41–50years, 3(7.5%) >50years and 2(5%) belonged in the age group of <20years. The study showed equal distribution of males and females 1:1(50%). Housewives constituted the largest group 10(25%), followed by students 7(17.5%) and skilled workers 6(15%).

Persistent allergic rhinitis was slightly more prevalent than intermittent allergic rhinitis 21 vs. 19(52.5% vs. 47.5%). Deviated nasal septum to Left was the most common anatomical finding 22(55%), followed by deviation to Right 17(42.5%), and S-shaped deviation was seen in 1(2.5%). Most patients had a normal absolute eosinophil count 33(82.5%), with only 7(17.5%) demonstrating raised eosinophil levels. Overall, the study population predominantly comprised young adults with, a slight predominance of persistent allergic rhinitis, and left-sided septal deviation.

The symptom profile showed that sneezing was present in all 40 patients (100%), followed by nasal obstruction in 37 patients (92.5%). Itching was reported by 30(75%), while rhinorrhoea was present in 27(67.5%) patients. Headache was observed in 13(32.5%), and anosmia was the least common symptom, present in 6(15%)patients.



Graph 1: Symptom Profile of Study Subjects

Table 1: Nasal Endoscopy Finding of Study Subjects(n=40)

Pass	Finding	No of Subjects (n)	Percentage (%)
1st Pass	DNS Left	22	55
	DNS Right	17	42.5
	DNS 'S' shaped	1	2.5
2nd Pass	Normal	19	47.5
	Not Possible (due to DNS)	21	52.5
3rd Pass	Normal	19	47.5
	Not Possible (due to DNS)	21	52.5

Nasal endoscopy findings showed that in the 1st pass, DNS to left was seen in 22 cases (55%), DNS to right in 17(42.5%) and 'S' shaped DNS in 1(2.5%)cases. In both the 2nd and 3rd passes, endoscopy was normal in 19(47.5%), while it was not possible due to DNS in 21 (52.5%) cases.

Pre operative 21(52.5%) cases had moderate, 16(40%) had severe, 3(7.5%) cases had mild NOSE score and Pre operatively on ARCT score 29(72.5%) had poor allergic control out of 40 subjects.

Table 2: Comparison of NOSE and ARCT Score at Different Time Points (n=40)

NOSE Score	Preoperative n (%)	1-Month Post-op n(%)	3-Months Post-op n(%)
Very Mild (0–5)	0	4 (10.0)	5 (12.5)
Mild (6–10)	3 (7.5)	30 (75.0)	32 (80.0)
Moderate (11–15)	21 (52.5)	6 (15.0)	3 (7.5)
Severe (16–20)	16 (40.0)	0	0

ARCT Score Category			
Poor Control (<15)	29 (72.5%)	10 (25%)	6 (15%)
Well Controlled (≥15)	11 (27.5%)	30 (75%)	34 (85%)

There was marked postoperative improvement in NOSE score severity distribution, with most patients shifting from moderate/severe categories preoperatively to mild/very mild categories at 3 months follow-up. The comparison of NOSE score showed a reduction from a preoperative mean score of 14.3 ± 3.16 to 8.35 ± 2.92 at 1 month postoperatively and 7.28 ± 2.26 at 3 months postoperatively. The difference was statistically significant with a **p-value <0.001**, indicating significant postoperative reduction in nasal obstruction score.

Postoperative ARCT score distribution also showed significant improvement in allergic rhinitis control, with the majority of patients achieving well-controlled status by 3 months follow-up. The ARCT score showed improvement from a preoperative mean score of 11.57 ± 3.2 to 16.82 ± 3.33 at 1 month postoperatively and 17.88 ± 3.2 at 3 months postoperatively. The change was statistically significant with a p-value <0.001, indicating significant postoperative improvement in allergic rhinitis control score.

Table 3: Postoperative Relief of Symptoms Reported by Subjects

Symptoms	Preoperative symptoms		3 months Post-Op	
	No. of Subjects (n)	Percentage (%)	No. of Subjects (n)	Percentage (%)
Sneezing	40	100	20	50
Nasal obstruction	37	92.5	36	97.3
Itching	30	75	19	63.33
Rhinorrhoea	27	67.5	13	48.15
Headache	13	32.50	12	92.31
Anosmia	6	15	5	83

Postoperative (After 3 months) symptom relief was highest for nasal obstruction, with relief in 36 of 37(97.30%) patients, followed by headache in 12 of 13(92.31%) patients. Itching relief was reported in 19 of 30(63.33%), sneezing relief in 20 of 40(50%), and rhinorrhoea relief in 13 of 27(48.15%) patients.

DISCUSSION

The aim of the present study was to evaluate the role of septal correction in patients with allergic rhinitis associated with deviated nasal septum and to assess its effect on nasal obstruction, allergic rhinitis control, endoscopic findings, and postoperative symptom relief.

The study predominantly included young adults, with the highest proportion in the 21–30 year age group, indicating that allergic rhinitis with deviated nasal septum (DNS) commonly affects the economically productive population. Similar findings have been reported by Na'ara et al. [11] and Jayapriya et al. [12]. Sneezing (100%) and nasal obstruction (92.5%) were the most frequent presenting symptoms, reflecting the combined effects of allergic inflammation and mechanical nasal obstruction, consistent with the observations of Seidman et al. [13].

Preoperative nasal endoscopy demonstrated DNS to Left in 22(55%), DNS to Right in 17(42.5%) and 'S' shaped DNS in 1(2.5%) patients, while second- and third-pass endoscopic examination could not be completed in 21(52.5%) patients due to marked septal deviation, highlighting the extent of anatomical obstruction. Similar observations regarding the utility of nasal endoscopy in evaluating DNS have been reported by Jayapriya et al. [12].

Septal correction produced marked improvement in nasal obstruction, as evidenced by the substantial shift in NOSE score categories from predominantly moderate/severe preoperatively to mild/very mild at 3 months. Likewise, ARCT scores showed progressive improvement, with well-controlled allergic rhinitis increasing from 27.5% preoperatively to 85% postoperatively. These findings are in agreement with Ghosh et al. [14] and Gillman et al. [15], who reported significant postoperative improvements in nasal obstruction and symptom control following septoplasty in patients with allergic rhinitis and DNS. Our findings are also consistent with the systematic review and meta-analysis by Elhadi et al. [16], which demonstrated superior improvement in nasal obstruction outcomes with surgical management compared to non-surgical treatment.

Among individual symptoms, the greatest postoperative relief was

observed for nasal obstruction (97.3%), headache (92.3%), and anosmia (83.3%), whereas improvement in sneezing and rhinorrhoea was comparatively modest. This suggests that septal correction effectively relieves symptoms attributable to structural nasal obstruction, while allergic symptoms continue to require adjunctive medical therapy, a finding comparable to that reported by Gillman et al. [15].

Conclusion

The study focused on an important and commonly encountered clinical condition, namely allergic rhinitis associated with deviated nasal septum, where both inflammatory and anatomical factors contribute to nasal symptoms. In Allergic Rhinitis with DNS medical treatment alone does not provide complete relief. Following septal correction, NOSE score reduced from 14.3 ± 3.16 to 7.28 ± 2.26 at 3 months, and ARCT score improved from 11.57 ± 3.2 to 17.88 ± 3.2 (both with $p < 0.001$). The study demonstrated statistically significant improvement in both NOSE and ARCT scores, with p -value < 0.001 , supporting the effectiveness of septal correction.

Thus, septal correction effectively improves nasal obstruction and supports better allergic rhinitis control by improving the drug delivery of the nasal spray in the nasal cavity, thereby enhancing the anti-inflammatory effects of medical therapy. It also helps in improvement of the airflow and mucosal hydration which help restore more effective mucociliary function and facilitates the clearance of allergens.

REFERENCES

1. Akhouri S, House SA. Allergic Rhinitis. [Updated 2023 Jul 16]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK538186/>
2. Nur Husna SM, Tan HT, Md Shukri N, Mohd Ashari NS, Wong KK. Allergic Rhinitis: A Clinical and Pathophysiological Overview. *Front Med (Lausanne)*. 2022 Apr 7;9:874114. doi: 10.3389/fmed.2022.874114. PMID: 35463011; PMCID: PMC9021509.
3. Kim TK, Jeong JY. Deviated nose: Physiological and pathological changes of the nasal cavity. *Arch Plast Surg*. 2020 Nov;47(6):505-515. doi: 10.5999/aps.2020.01781. Epub 2020 Nov 15. PMID: 33238336; PMCID: PMC7700847.
4. Alghamdi FS, Albogami D, Alsarayhi AS, Alshibey AY, Alkaabi TH, Alqurashi LM, Alahdal AA, Saber AA, Almansouri OS. Nasal Septal Deviation: A Comprehensive Narrative Review. *Cureus*. 2022 Nov 10;14(11):e31317. doi: 10.7759/cureus.31317. PMID: 36514566; PMCID: PMC9736816.
5. Abdullah B, Abdul Latiff AH, Manuel AM, Mohamed Jamli F, Dalip Singh HS, Ismail IH, Jahendran J, Saniasiaya J, Keen Woo KC, Khoo PC, Singh K, Mohammad N, Mohamad S, Husain S, Mösges R. Pharmacological Management of Allergic Rhinitis: A Consensus Statement from the Malaysian Society of Allergy and Immunology. *J Asthma Allergy*. 2022 Aug 2; 15:983-1003. doi: 10.2147/JAA.S374346. PMID: 35942430; PMCID: PMC9356736.
6. Chiesa Estomba C, Rivera Schmitz T, Ossa Echeverri CC, Betances Reinoso FA, Osorio Velasquez A, Santidrian Hidalgo C. Compensatory hypertrophy of the contralateral inferior turbinate in patients with unilateral nasal septal deviation. A computed tomography study. *Otolaryngol Pol*. 2015;69(2):14-20. doi: 10.5604/00306657.1149568. PMID: 26224225.
7. Bekin Sarikaya PZ, Bayar Muluk N. Relationship Between Nasal Septal Deviation Angles and Turbinates: A Computed Tomography Study. *Cureus*. 2023 Feb 21;15(2):e35253. doi: 10.7759/cureus.35253. PMID: 36825074; PMCID: PMC9942431.
8. Lim ZF, Rajendran P, Musa MY, Lee CF. Nasal airflow of patient with septal deviation and allergy rhinitis. *Vis Comput Ind Biomed Art*. 2021 May 20;4(1):14. doi: 10.1186/s42492-021-00080-2. PMID: 34014417; PMCID: PMC8137764.
9. Wu Y, Yu T, Zhang Z, Wang X, Gao S. The benefits of septoplasty for patients with deviated nasal septum and allergic rhinitis: a meta-analysis. *Sci Rep*. 2024 Nov 21;14(1):28855. doi: 10.1038/s41598-024-80377-3. PMID: 39572690; PMCID: PMC11582568.
10. Lizano Guevara F, Rojas Peláez A, Soto-Junco EJ, Sáenz Araya D, Sevilla Torres E, Baizan Orias SD. Clinical Impact of Nasal Obstructive Syndrome and Its Current Management Strategies. *Cureus*. 2025 Aug 22;17(8):e90762. doi: 10.7759/cureus.90762. PMID: 40984961; PMCID: PMC12450431.
11. Na'ara S, Kaptzan B, Gil Z, Ostrovsky D. Endoscopic Septoplasty Versus Traditional Septoplasty for Treating Deviated Nasal Septum: A Prospective, Randomized Controlled Trial. *Ear Nose Throat J*. 2021 Nov;100(9):673-678. doi: 10.1177/0145561320918982. Epub 2020 Apr 27. PMID: 32339048.
12. Jayapriya D, Vikram Raj Mohanam TC, Kurien M, Savary N, Nalamate R, Kalaiarasan S, Jamaldeen J, Venkatesan SK, Lakshana Deve VM. Surgical Intervention in Allergic Rhinitis: Stuffy Versus Sneezing Runny Nose. *Indian J Otolaryngol Head Neck Surg*. 2024 Jun;76(3):2626-2634. doi: 10.1007/s12070-023-04404-x. Epub 2024 Mar 19. PMID: 38883460; PMCID: PMC11169335.
13. Seidman MD, Gurgel RK, Lin SY, Schwartz SR, Baroody FM, Bonner JR, Dawson DE, Dykewicz MS, Hackell JM, Han JK, Ishman SL, Krouse HJ, Malekzadeh S, Mims JW, Omole FS, Reddy WD, Wallace DV, Walsh SA, Warren BE, Wilson MN, Nnacheta LC; Guideline Otolaryngology Development Group. AAO-HNSF. Clinical practice guideline: Allergic rhinitis. *Otolaryngol Head Neck Surg*. 2015 Feb;152(1 Suppl):S1-43. doi: 10.1177/0194599814561600. PMID: 25644617.
14. Ghosh SK, Dutta M, Haldar D. Role of Bilateral Inferior Turbinoplasty as an Adjunct to Septoplasty in Improving Nasal Obstruction and Subjective Performance in Patients with Deviated Nasal Septum Associated with Allergic Rhinitis: An Interventional, Prospective Study. *Ear Nose Throat J*. 2023 Jul;102(7):445-452. doi: 10.1177/01455613211015440. Epub 2021 May 10. PMID: 33970700.
15. Gillman GS, Staltari GV, Chang YF, Mattos JL. A Prospective Study of Outcomes of Septoplasty with Turbinate Reductions in Patients with Allergic Rhinitis. *Otolaryngol Head Neck Surg*. 2019 Jun;160(6):11181123. doi: 10.1177/0194599819838761. Epub 2019 Mar 26. PMID: 30909804.
16. Elhadi UA, Safia A, Masalha M. Septoplasty versus non-surgical treatment for deviated nasal septum: a systematic review and meta-analysis. *Journal of Clinical Medicine*. 2026;15(10):3930. doi:10.3390/jcm15103930.