National Board of Examinations - Journal of Medical Sciences
Volume 3, Issue 3, Pages 336–342, March 2025
DOI 10.61770/NBEJMS.2025.v03.i03.010

CASE SERIES

Functional and Structural Outcomes of Septorhinoplasty in a Tertiary Care Center

Bashir Nalakath Kunhimon,[1] Asha Roy,[2] Anwar Sadath CA[2,*] and Bavija V Krishna[2]
[1]*ENT Consultant, Central Hospital, Sheik Zayed Street, Maysaloon, Sharjah, UAE*
[2]*Department of Otorhinolaryngology, MES Medical College Perinthalmanna, Kerala, India*

Accepted: 16-February-2025 / Published Online: 01-March-2025

Abstract

Introduction: Nose is the hallmark feature of a human face and it plays a pivotal role in both aesthetic harmony and essential physiological functions. Nasal obstruction is one of the common complaint in otorhinolaryngology, with significant affect in the quality of life. Septorhinoplasty is one among the surgical procedure which addresses both functional and aesthetic concerns of nasal obstruction. It improves nasal airflow and helps in achieving the normal contour. This study evaluates the functional and structural outcomes of septorhinoplasty at a tertiary care center. **Materials and Methods:** This case series was conducted at MES Medical College, Kerala, among 20 patients above 18 years of age who presented with external nasal deformity and nasal obstruction. Institutional Ethical clearance was obtained, and informed consent was secured from all participants. Preoperative evaluation of all the study participants were done (clinical history, ENT examination, and diagnostic nasal endoscopy). Functional and structural outcomes of all the participants were assessed using the Sino-Nasal Outcome Test (SNOT-22) and Rhinoplasty Outcome Evaluation (ROE) questionnaire, administered preoperatively and postoperatively. **Results:** Most patients (70%) were between 18 and 20 years of age, with a male predominance (80%). Preoperative SNOT-22 scores significantly reduced from a mean of 27.95 to 2.10 postoperatively indicating a better outcome after surgery. Similarly, ROE scores increased from a preoperative mean of 4.05 to 23.30 postoperatively, demonstrating a substantial improvement in patient-reported outcome and satisfaction. Complications were minimal, occurring in less than 5% of study partcipants. **Conclusion:** Septorhinoplasty significantly contributes for improvement of functional and aesthetic outcomes, with better patient satisfaction and minimal complications. This procedure effectively addresses nasal deformities and enhance overall well-being and quality of life.

Keywords: Septorhinoplasty, nasal obstruction, functional outcomes, aesthetic outcomes, patient satisfaction

*Corresponding Author: Anwar Sadath C A
Email: caanwar@gmail.com

Introduction

The nose is a primary defining feature of a human face which plays a major role in maintaining essential physiological functions and aesthetic harmony. It is the entry point for the upper airway and helps in conditioning, filtration and humidification of the inhaled air. It also safeguards the lower airway against allergens and pollutants [1]. Nasal obstruction is a common presenting complaint in otorhinolaryngology department, which significantly impacts the quality of life [2]. Many patients who present with nasal obstruction, have external nasal deformities that requires surgical correction. Septorhinoplasty is one of the surgical procedure that is designed to address both the functional impairment caused by a deviated nasal septum and also the external deformation. It aims to improve nasal airflow while also achieving a natural appearance that synchronises with other features of the face [3-5].

The effectiveness of the procedure is measured not only by clinical improvements but also by patient satisfaction and enhanced quality of life [6]. The nasal reconstructive surgeries dates back to History of ancient India, where Father of Indian surgery, Sushrutha in his Sushruta Samhitha describes the techniques for nasal reconstruction [7,8]. Many modern techniques have developed since then and the latest being the transformation from closed to open rhinoplasty which was pioneered by Goodman and refined by Anderson [9,10]. Outcome of the surgery was evaluated in terms of external appearance, nasal obstruction, and overall quality of life after surgical procedure [11,12]. Patient-reported outcome measures plays a key role in evaluating the surgical success. The Sino-Nasal Outcome Test (SNOT-22) and the Rhinoplasty Outcome Evaluation (ROE) scale are the two widely used tools in rhinology for evaluating the outcomes of septorhinoplasty. The SNOT-22 questionnaire evaluates the severity of nasal symptoms and their impact on the patient's daily life [13], while the ROE scale assesses both functional and aesthetic outcomes, reflecting the patient's satisfaction with the surgical procedure [14]. These standardized validated tools provides a comprehensive understanding of the subjective improvements perceived by the study participants.

The procedure of Septorhinoplasty has both physical and psychological benefits. The procedure doesn't only resolve the functional impairment but also enhances facial aesthetics thereby leading to psychological well-being [15]. The Patient satisfaction measures depends on factors like occupation, social needs, and the psychological state of the study participant [16]. As such, measuring both objective and subjective outcomes is critical in assessing the success of the surgery. This study focuses on evaluating the functional and structural outcomes of septorhinoplasty, providing insights into its effectiveness in improving nasal function, external appearance, and quality of life.

Materials and Methods

This case series was conducted in a tertiary care teaching hospital after obtaining prior ethical clearance from the Institutional Human Ethics Committee. All participants over 18 years who presented to the outpatient department with Deviated nasal septum and external nasal deformity who were posted for septorhinoplasty surgery were contacted by the principal

investigator, briefed about the study objectives of the study, study procedure rights of the participant and other ethical concerns through a detailed Patient Information Sheet (PIS). Written informed consents was obtained after oral confirmation. Confidentiality was ensured and data was anonymized to uphold privacy. Exclusion criteria included individuals with cleft lip and palate, pre-diagnosed psychiatric disorders, or those unwilling to participate.

A detailed preoperative evaluation was performed which included a thorough clinical history, ENT examination, and diagnostic nasal endoscopy for all the study participants. Sociodemographic data and relevant clinical details were collected using a semi-structured proforma. Functional and structural outcomes of septorhinoplasty were assessed using the Sino-Nasal Outcome Test (SNOT-22) questionnaire [13] and Rhinoplasty Outcome Evaluation (ROE) questionnaire [14], administered preoperatively and at follow-up visits postoperatively.

An open surgical approach which ensured adequate exposure of all the nasal structures were performed uniformly by a senior surgeon. The surgery involved correction of septal deviations using techniques such as scoring, suturing, and placement of grafts to restore functional and structural balance. Caudal septal deviations were corrected by adjusting the strut for proper midline alignment. For patients with severe external deformities, cartilage grafts harvested from the nasal septum was used to support the nasal framework and to enhance the aesthetic outcome. The incisions were meticulously closed to minimize scarring, and proper nasal tip support was ensured to maintain structural integrity and long-term results. Postoperative care included nasal packing, if required, and regular follow-ups to monitor healing and assess outcomes.

Postoperative follow-ups were scheduled to collect data on improvements in nasal obstruction and external appearance. Outcomes were measured and compared using patient-reported questionnaires, providing both subjective and objective insights into surgical success.

Data were entered into Microsoft Excel and analyzed using SPSS version 26. Continuous variables were expressed as mean and standard deviation, while categorical variables were summarized as frequencies and percentages. Wilcoxin signed Ranked test was used to find out the association between pre operative and post operative SNOT and ROE scores. A 95% confidence interval was applied for all analyses to ensure statistical significance.

Results

This case series was done among 20 patients to evaluate the functional and structural outcomes of septorhinoplasty. The data indicates that the majority of the patients 14 (70%) were under 20 years of age, with a male predominance 16 (80%). Most patients 9 (45%) had symptoms lasting 5–10 years. Common nasal dorsum abnormalities included deviation to the right 5 (25%) and left 4 (20%), with 3 (15%) presenting with a hump or hump with deviation to the right. Septal deviation was predominantly to the right 12 (60%). Open surgery was the preferred approach 17 (85%), with osteotomy performed in 17 (85%) of cases and camouflage techniques used in 9 (45%). Complications were minimal, occurring in only 1 (5%) of cases (Table 1).

Table 1: Demographic, Clinical, and Surgical Profile of Patients with Nasal Deformities

Parameter	Sub classification	Frequency	Percentage
Age(in years)	< 20	14	70
	21-30	5	25
	➢ 30	1	5
Sex	Male	16	80
	Female	4	20
Duration	Less than 1 year	1	5
	2-5 years	4	20
	5 -10 years	9	45
	11-15 years	2	10
	16-20 years	3	15
	More than 20 years	1	5
Dorsum	Hump	3	15
	Hump, Deviation to right	3	15
	Hump, Deviation to left	2	10
	Pseudo hump	2	10
	Deviation to right	5	25
	Deviation to left	4	20
	Bulbous deformity	1	5
Septum	DNS to right	12	60
	DNS to left	8	40
Surgery	Open	17	85
	Close	3	15
Osteotomy	Yes	17	85
	No	3	15
Complications	Yes	1	5
	No	19	95

The data reveals that the patients' ages ranged from 17 to 34 years, with a mean age of 20.75 ± 4.19 years. The duration of symptoms varied widely, from 0.5 to 24 years, with a mean duration of 9.33 ± 6.55 years. Preoperative SNOT-22 scores ranged from 6 to 47, with a mean of 27.95 ± 12.40, significantly improving postoperatively to a mean of 2.10 ± 1.52. Similarly, the ROE scores showed a marked increase from a preoperative mean of 4.05 ± 2.74 to a postoperative mean of 23.30 ± 0.73, indicating substantial improvement in patient-reported outcomes and satisfaction following nasal surgery (Table 2).

Table 2. Descriptive statistics of Clinical Parameters of Patients Undergoing Nasal Surgery

Parameter	Minimum	Maximum	Mean	Std. Deviation
AGE	17	34	20.75	4.191
DURATION	0.5	24.0	9.325	6.5500
SNOT 22 PREOP	6	47	27.95	12.403
SNOTT 22 POST OP	0	6	2.10	1.518
ROE PREOP	1	11	4.05	2.743
ROE POST OP	22	24	23.30	0.733

The analysis shows significant improvements in patient-reported outcomes following nasal surgery. The median SNOT-22 score decreased from 23 (IQR: 6–47) preoperatively to 2 (IQR: 0–6) postoperatively, with a mean rank difference of 10.5 and a Z value of -3.921 ($p < 0.001$), indicating a marked reduction in nasal symptom severity. Similarly, the median ROE score increased significantly from 3 (IQR: 1–11) preoperatively to 23 (IQR: 22–24) postoperatively, with a mean rank difference of 10.5 and a Z value of -3.935 ($p < 0.001$) (Table 3).

Table 3. Comparison of Preoperative and Postoperative Patient-Reported Outcomes Using Wilcoxin signed rank test

Scale	Group	Median	IQR	Mean Rank	Z value	p- value
SNOT 22	Preop	23	6-47	10.5	-3.921	<0.001
	Post op	2	0-6			
ROE	Preop	3	1-11	10.5	-3.935	<0.001
	Post op	23	22-24			

Discussion

The mean age was around 21 years. Similar results were obtained in other studies too. Sasindran et al in their study observed a mean age of 26.1 years. Majority of their study population were in the age of 11- 20 years [17]. Baser et al also found that the mean age of the study participants was 31.62 years [4]. Increased cosmetic concern among youngsters, Higher perception of body image, impact of nasal obstruction during development affects the quality of life, Higher perception of body image and greater potential for improvement are few reasons for surgery in young age [4,5,17]. Our study reported more male population. Similar results was observed by Baser et

al. [5]. In contrast Sandran et al. [17] and Simsek et al. [4] observed more than two third were females in their study. The mean duration of symptoms was 9.33 years. Sasindran et al. [17] observed a minimum duration of 6.33 years in their study. Significant reduction in nasal obstruction was observed in other studies too [2-5].

Significant reduction of the SNOT 22 score from 27.95 preoperatively to 2.10 post operatively, $P<0.001$) demonstrates the effectiveness of the surgical procedure in alleviating nasal obstruction, improvement of nasal function and enhancing the quality of life in patients who suffered from chronic nasal obstruction. Similar results were observed in multiple studies [2,3].

High patient satisfaction with the cosmetic results of surgery is demonstrated by the significant improvement in ROE ratings (from a preoperative mean of 4.05 to a postoperative mean of 23.30, $p < 0.001$). This enhancement shows how septorhinoplasty can help patients with their cosmetic concerns and restore facial harmony, which in turn promotes psychological well-being and increased self-esteem. Similar results were observed in other studies [5,17]. After surgery, the relief from long standing symptoms and improved cosmetic appearance are the main reasons for the improved patient satisfaction.

Limitations and Recommendations:

- The small sample size (n=20) limits generalizability, and future studies with larger cohorts could provide more comprehensive insights.
- Long-term follow-up would be beneficial to assess the durability of the surgical outcomes.
- Further research comparing open and closed surgical approaches could help refine indications for each technique.

Conclusion

Overall, the results of this case series confirm the significant benefits of septorhinoplasty in addressing both functional and aesthetic concerns, with minimal complications. These findings reinforce the role of septorhinoplasty as a transformative procedure for patients with nasal deformities. The high patient satisfaction with the cosmetic results underscores the importance of addressing both functional and aesthetic concerns to enhance overall well-being and rebuilding their self-esteem.

Statements and Declarations

Conflicts of interest

The authors declare that they do not have conflict of interest.

Funding

No funding was received for conducting this study.

References

1. Van Cauwenberge P, Sys L, De Belder T, Watelet J-B. Anatomy and physiology of the nose and the paranasal sinuses. Immunol Allergy Clin N Am. 2004;24(1):1–17.
2. Buckland JR, Thomas S, Harries PG. Can the Sino-nasal Outcome Test (SNOT-22) be used as a reliable outcome measure for successful septal surgery? Clin Otolaryngol Allied Sci. 2003;28(1):43–7.
3. Phillips PS, Stow N, Timperley DG, et al. Functional and cosmetic outcomes of external approach

septoplasty. Am J Rhinol Allergy. 2011;25(5):351–7.
4. Simsek T, Erdoğan MM, Özçetinkaya Erdoğan S, et al. Assessment of functional and aesthetic outcomes in septorhinoplasty. Eur Arch Otorhinolaryngol. 2021;278:1089–97.
5. Baser E, Kocagöz GD, Çalim ÖF, et al. Assessment of patient satisfaction with evaluation methods in open technique septorhinoplasty. J Craniofac Surg. 2016;27(2):420–4.
6. Alsarraf R. Outcomes research in facial plastic surgery: a review and new directions. Aesthet Plast Surg. 2000;24(3):192–7.
7. Eisenberg I. A history of rhinoplasty. S Afr Med J. 1982;62(9):286–92.
8. Yalamanchili H, Sclafani A, Schaefer S, et al. The path of nasal reconstruction: from ancient India to the present. Facial Plast Surg. 2008;24(1):003–10.
9. Goodman WS, Charbonneau PA. External approach to rhinoplasty. Laryngoscope. 1974;84(12):2195–201.
10. Anderson JR, Johnson CM, Adamson P. Open rhinoplasty: an assessment. Otolaryngol Head Neck Surg. 1982;90(2):272–4.
11. Barone M, Cogliandro A, Di Stefano N, et al. A systematic review of patient-reported outcome measures after rhinoplasty. Eur Arch Otorhinolaryngol. 2017;274(4): 1807–11.
12. Mazzola I, Mazzola R. History of reconstructive rhinoplasty. Facial Plast Surg. 2014;30(3):227–36.
13. Stewart MG, Witsell DL, Smith TL, et al. Development and validation of the Nasal Obstruction Symptom Evaluation (NOSE) scale. Otolaryngol Head Neck Surg. 2004;130(2):157–63.
14. Alsarraf R, Laccourreye O, Fitzgerald R, et al. Validated quality-of-life measures for patients undergoing cosmetic and functional rhinoplasty: A practical guide. Plast Reconstr Surg. 2001;108(2):515–7.
15. Higginson IJ, Carr AJ. Measuring quality of life: Using quality of life measures in the clinical setting. BMJ. 2001;322:1297–300.
16. Corey JP, Reidy PM. How can we increase the quality and value of clinical research? Ear Nose Throat J. 2004;83:796, 798–9.
17. Sasindran V, Harikrishan B, Mathew N. Cosmetic and Functional Outcomes of Septorhinoplasty. Indian J Otolaryngol Head Neck Surg. 2020 Jun;72(2):194-199. doi: 10.1007/s12070-019-01756-1.