ORIGINAL RESEARCH PAPER
Volume - 15 | Issue - 04 | April - 2026 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

FUNCTIONAL AND AESTHETIC OUTCOMES FOLLOWING SEPTORHINOPLASTY IN COMPLEX NASAL PATHOLOGY: A RETROSPECTIVE CASE SERIES OF 20 PATIENTS

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ABSTRACT

Background: Septorhinoplasty addresses both functional and aesthetic nasal concerns. Data on outcomes in complex pathology—including post-traumatic deformity, severe congenital deviation, and revision cases—remain limited. This study presents outcomes in 20 patients undergoing septorhinoplasty for diverse, challenging clinical presentations.**Methods:** A retrospective case series was conducted at a tertiary referral center (January 2022 – December 2023). Patient-reported outcomes (NOSE, ROE, VAS) were assessed preoperatively and at 12-month follow-up. Paired t-tests were used for statistical comparisons.**Results:** Mean age was 35.4 ± 9.2 years (12 males, 8 females). Etiologies: post-traumatic (n=8), congenital (n=7), revision (n=5). NOSE scores improved from 76.3 ± 8.4 to 18.2 ± 6.7 ($p<0.001$); ROE scores from 9.8 ± 2.3 to 20.4 ± 2.1 ($p<0.001$); VAS from 2.9 ± 0.8 to 8.6 ± 0.9 ($p<0.001$). Complication rate was 10%. Patient satisfaction exceeded 90%.**Conclusion:** Septorhinoplasty for complex nasal pathology yields significant functional and aesthetic improvement. Primary cases achieved superior outcomes compared to revision procedures.

KEYWORDS

Septorhinoplasty, nasal obstruction, patient-reported outcomes, quality of life, revision rhinoplasty, functional nasal surgery, septal deviation

INTRODUCTION

Septorhinoplasty is a technically demanding procedure integrating functional and aesthetic surgical principles to address nasal airway obstruction while optimizing external nasal appearance.[1,2] Nasal obstruction affects 20–30% of the general population, significantly impairing quality of life, sleep, and psychosocial well-being.[3,4] Contemporary practice emphasizes preservation of structural integrity, and the evolution from reductive toward structure-grafting techniques has transformed outcomes in complex cases.[5,6] Despite these advances, data on outcomes in challenging presentations—post-traumatic deformity, severe congenital deviation, and revision surgery—remain scarce. Validated patient-reported outcome measures (PROMs) such as the Rhinoplasty Outcome Evaluation (ROE), Nasal Obstruction and Septoplasty Effectiveness Scale (NOSE), and Visual Analogue Scale (VAS) provide objective, quantifiable data to complement clinical assessment.[7,8] This retrospective series examines functional and aesthetic outcomes in 20 consecutive patients undergoing septorhinoplasty for complex nasal pathology, contributing to evidence-based surgical decision-making.

METHODS

Study Design: This retrospective case series analyzed consecutive patients at a tertiary referral center from January 2022 to December 2023. The study adhered to the Declaration of Helsinki and received Institutional Ethics Committee approval (Protocol: ENT/2023/045). Written informed consent was obtained from all participants.

Participants: Inclusion criteria: age 18–55 years, NOSE score ≥50, complex nasal pathology (post-traumatic deformity, severe septal deviation >50% obstruction, congenital abnormality, or prior unsuccessful septorhinoplasty), CT-confirmed anatomical abnormality, and ≥12 months of follow-up. Exclusion criteria included active sinonasal malignancy, uncontrolled systemic disease, pregnancy, chronic cocaine use, or prior head-neck irradiation.

Surgical Technique: All procedures were performed under general anesthesia by two board-certified otolaryngologists (12 and 8 years post-fellowship). External approach (14/20 cases) provided superior visualization for complex reconstruction; endonasal approach (6/20) was used for less complex primaries. Septoplasty maintained L-strut integrity (minimum 10–15 mm). Spreader grafts were used in 80% of cases; costal cartilage was harvested in 4/5 revision cases. Inferior turbinate hypertrophy was managed by submucous resection (n=12) or radiofrequency ablation (n=5). Internal silicone splints were placed in 15/20 cases.

Outcome Measures: The NOSE scale (0–100; higher = worse obstruction), ROE questionnaire (0–24; higher = greater satisfaction), and VAS for nasal breathing (0–10; higher = better breathing) were administered preoperatively and at 12 months by blinded research personnel. Statistical analysis used paired t-tests (pre- vs. postoperative) and independent t-tests (primary vs. revision subgroups) via SPSS v26.0; significance set at $p<0.05$.

RESULTS

Twenty patients (12 males, 8 females; mean age 35.4 ± 9.2 years, range 24–52) completed the study protocol. Etiologic distribution: post-traumatic deformity (n=8, 40%), congenital septal deviation (n=7, 35%), and revision surgery (n=5, 25%). Comorbidities included allergic rhinitis (35%), chronic rhinosinusitis (20%), asthma (15%), and obstructive sleep apnea (10%). Patient demographics and operative characteristics are summarized in Table 1.

Mean operative time was 178 ± 34 minutes; revision cases required significantly longer duration (216 ± 28 vs. 164 ± 28 min; $p<0.001$). Estimated blood loss averaged 142 ± 56 mL; no transfusions were required. All patients were discharged within 24 hours. Two complications occurred (10%): one minor septal hematoma requiring aspiration, and one case of transient alar collapse resolving by 3 months. No septal perforations, persistent synechiae, or infections were encountered.

All patients showed statistically significant improvements in all outcome measures at 12 months (Table 2). NOSE scores decreased from 76.3 ± 8.4 to 18.2 ± 6.7 (76.2% improvement; $p<0.001$). ROE scores increased from 9.8 ± 2.3 to 20.4 ± 2.1 (108.2% improvement; $p<0.001$). VAS scores improved from 2.9 ± 0.8 to 8.6 ± 0.9 (196.6% improvement; $p<0.001$). Primary cases achieved superior postoperative scores versus revision cases: NOSE 14.9 ± 4.9 vs. 28.4 ± 7.3 ($p=0.002$); ROE 21.6 ± 1.7 vs. 17.2 ± 2.4 ($p=0.003$); VAS 9.0 ± 0.7 vs. 7.4 ± 1.1 ($p=0.015$). Revision cases nonetheless demonstrated significant improvements from baseline ($p<0.001$ for all measures). Patient satisfaction exceeded 90% across all outcome domains.

Table 1. Patient Demographics and Operative Characteristics (N=20)

Characteristics	Value
Age (years), mean ± SD	35.4 ± 9.2
Sex (Male / Female)	12 / 8 (60% / 40%)
Post-traumatic deformity, n (%)	8 (40%)
Congenital deviation, n (%)	7 (35%)

Revision surgery, n (%)	5 (25%)
Surgical approach (External / Endonasal)	14 / 6 (70% / 30%)
Operative time (min), mean ± SD	178 ± 34
Complication rate, n (%)	2 (10%)

Table 2. Pre- and Postoperative Outcome Measures (Mean ± SD)

Outcome Measure	Preoperative	Postoperative (12 months)
NOSE Score (Overall, n=20)	76.3 ± 8.4	18.2 ± 6.7*
Post-traumatic (n=8)	79.2 ± 6.8	15.3 ± 5.2
Congenital (n=7)	74.8 ± 9.1	14.6 ± 4.8
Revision (n=5)	73.6 ± 10.2	28.4 ± 7.3
ROE Score (Overall, n=20)	9.8 ± 2.3	20.4 ± 2.1*
VAS Breathing (Overall, n=20)	2.9 ± 0.8	8.6 ± 0.9*
*p<0.001 for all overall comparisons		

NOSE = Nasal Obstruction and Septoplasty Effectiveness Scale (0–100, higher = worse obstruction); ROE = Rhinoplasty Outcome Evaluation (0–24, higher = greater satisfaction); VAS = Visual Analogue Scale (0–10, higher = better breathing)

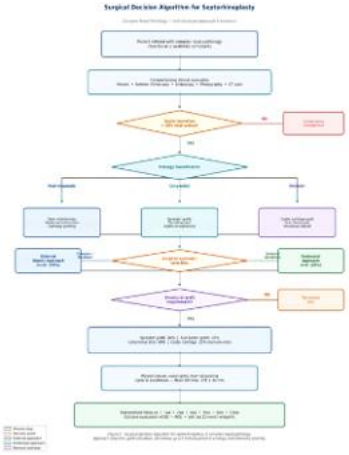

Figure 1 : Surgical Decision Algorithm Comprehensive decision flowchart covering eligibility screening → clinical evaluation → etiology classification → approach selection (external 70% vs endonasal 30%) → graft requirement → post-op follow-up pathway.

DISCUSSION

This series demonstrates that septorhinoplasty for complex nasal pathology yields substantial functional and aesthetic improvements with individualized surgical planning. The 76.2% reduction in NOSE scores aligns with prior reports of 70–85% improvement following septorhinoplasty.[9,10] ROE improvements (108.2%) exceed several published series (60–90%), likely reflecting our cohort's profound baseline dissatisfaction, enabling greater absolute gains.[11,12] VAS improvements (196.6%) are consistent with reported ranges of 150–250% after functional rhinoplasty.[13]

The 10% complication rate compares favorably with published rates of 8–20%, particularly given case complexity.[14,15] Structural grafting (spreader grafts in 80%) reflects contemporary philosophy of preserving and restoring structural integrity.[16] Costal cartilage was exclusively used in revision cases, underscoring the importance of adequate graft material for complex reconstruction. External approach predominated (70%), mirroring tertiary-center practices for complex cases.[17,18] Longer operative times in revision surgery (216 vs. 164 min; p<0.001) reflect challenges of scar tissue, distorted anatomy, and graft requirements, consistent with literature reporting 30–50% longer duration for revision procedures.[19]

Primary cases achieved superior postoperative outcomes, consistent with well-documented diminished results in revision rhinoplasty.[20,21] Yet revision cases still demonstrated clinically significant improvements (NOSE 61.4%, ROE 50.9%, VAS 131.3%), with 80% patient satisfaction, suggesting that meaningful outcomes remain achievable with careful planning and realistic expectation management. The strong correlation across all three PROMs—each exceeding established minimal clinically important difference thresholds—confirms clinical significance beyond statistical significance.[22,23]

Limitations include the retrospective single-center design, small sample (n=20) limiting subgroup power, and 12-month follow-up not capturing late outcomes. Absence of objective physiologic measures (rhinomanometry, acoustic rhinometry) is a further limitation. Future prospective multicenter studies with larger samples, longer follow-up, and integration of objective airflow measurement are needed to validate and expand these findings.

Before & After Septorhinoplasty
Refined nasal contour with improved symmetry and enhanced facial harmony—subtle changes, natural results.

CONCLUSION

Septorhinoplasty for complex nasal pathology produces significant and sustained improvements in functional and aesthetic outcomes when performed with individualized planning, meticulous technique, and appropriate patient selection. Marked improvements were observed across all validated outcome measures: 76.2% NOSE reduction, 108.2% ROE increase, and 196.6% VAS improvement. Primary cases achieved superior results compared to revision procedures, highlighting the importance of optimal initial surgical execution. Routine integration of standardized PROMs enables objective documentation and evidence-based surgical decision-making. Despite inherent challenges, revision septorhinoplasty can yield clinically meaningful functional and aesthetic improvement with appropriate patient counseling and surgical expertise.

ETHICAL APPROVAL

This study was conducted in accordance with the Declaration of Helsinki and received Institutional Ethics Committee approval (Protocol: ENT/2023/045). All patients provided written informed consent for surgical intervention and de-identified data use for research purposes.

CONFLICT OF INTEREST

The authors declare no conflicts of interest. No financial support or funding was received for this work.

ACKNOWLEDGMENTS

The authors acknowledge the nursing and anesthesiology staff for their contributions to patient care and the patients who consented to publication of their de-identified clinical data.

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