Original Article

An Observational Prospective Study in Adults Undergoing Turbinectomy and Turbinoplasty in Tertiary Health Care

V. Sudhir Babu[1], Monica T[2], V. Soma Sekhar[3]

[1]Professor and Head, Department of ENT, Guntur Medical College and Government General Hospital, Guntur, Andhra Pradesh, India, [2]III Year Postgraduate, Department of ENT, Guntur Medical College and Government General Hospital, Guntur, Andhra Pradesh, India, [3]Assistant Professor, Department of ENT, Guntur Medical College and Government General Hospital, Guntur, Andhra Pradesh, India

Abstract

Background: Inferior turbinate hypertrophy (ITH) is a major cause of chronic nasal obstruction, significantly affecting quality of life. Surgical interventions, such as turbinectomy and turbinoplasty, are widely used when conservative management fails. This study aimed to compare the clinical outcomes and complications of turbinectomy and turbinoplasty in adults. **Materials and Methods:** A prospective observational study was conducted in the Department of Otorhinolaryngology from May 2022 to December 2023. A total of 100 patients aged 18–50 years with ITH were randomized into two groups: turbinectomy (n=50) and turbinoplasty (n=50). Preoperative assessment included detailed history, diagnostic nasal endoscopy, and NOSE (Nasal Obstruction Symptom Evaluation) scoring. Surgical procedures were performed under standard protocol, and patients were followed at 15 days, 1 month, and 3 months postoperatively. Outcomes were assessed by changes in NOSE scores and postoperative complications. **Results:** The mean age was 33.32 years in the turbinectomy group and 31.24 years in the turbinoplasty group, with a male predominance in both cohorts. Preoperative NOSE scores were comparable (79.0 vs. 81.9; $p>0.05$). Postoperatively, both groups showed significant improvement, but turbinoplasty demonstrated lower mean NOSE scores at all intervals ($p<0.05$). Complications such as bleeding (12% vs. 4%), synechiae formation (10% vs. 4%), and crusting (8% vs. 2%) were more frequent in turbinectomy, though not statistically significant. **Conclusion:** Both procedures were effective in relieving nasal obstruction; however, turbinoplasty yielded superior symptomatic relief and fewer complications, supporting its preference as a surgical option for ITH in adults.

Keywords: Inferior turbinate hypertrophy, Nasal obstruction, Turbinectomy, Turbinoplasty, NOSE score, Endoscopic surgery.

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Introduction

Nasal obstruction remains one of the most common complaints in otorhinolaryngology, affecting patients across all age groups. Chronic obstruction not only compromises nasal airflow but also interferes with essential physiological processes, including olfaction, phonation, paranasal sinus ventilation, and overall respiratory efficiency.[1] Among the various etiologies, inferior turbinate hypertrophy (ITH) is a predominant cause, followed by septal deviation, nasal polyps, and nasopharyngeal tonsillar enlargement.[2] The inferior turbinate plays a vital role in regulating nasal airflow by providing inspiratory resistance, converting laminar flow into turbulent flow, and supporting mucociliary clearance through its specialized mucosa.[3] Hypertrophy may involve both bony and mucosal components and is frequently associated with allergic or vasomotor rhinitis, chronic inflammatory conditions, and compensatory mechanisms secondary to septal deviation.[4]

Initial management typically involves medical therapy with antihistamines, topical or systemic decongestants, and intranasal corticosteroids. However, patients with persistent symptoms despite conservative measures require surgical intervention.[1,3] The primary objective of turbinate surgery is to alleviate obstruction while preserving mucosal integrity and physiological function. A wide spectrum of surgical procedures has been described, broadly categorized into mucosal-sparing and non–mucosal-sparing techniques. Turbinectomy, involving partial or complete resection of the turbinate, and turbinoplasty, a mucosal-sparing procedure targeting submucosal tissue and bone, are the most commonly employed approaches.[2,5]

Despite widespread use, the relative efficacy and complication rates of turbinectomy versus turbinoplasty remain debated. The Nasal Obstruction Symptom Evaluation (NOSE) score, a validated tool for quantifying symptom severity, provides a reliable means of comparing surgical outcomes. This study was undertaken to evaluate and compare the subjective improvement and postoperative complications following turbinectomy and turbinoplasty in adult patients with ITH in a tertiary care setting

Materials and Methods

This prospective observational study was conducted in the

Address for correspondence: Dr. V. Soma Sekhar, Assistant Professor, Department of ENT, Guntur Medical College & Government General Hospital, Guntur, Andhra Pradesh, India.
E-mail: drvsomu1@gmail.com

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Department of Otorhinolaryngology, Guntur Medical College and Government General Hospital, Guntur, Andhra Pradesh, India, between May 2022 and December 2023.

Study Population

A total of 100 patients aged 18–50 years with clinically diagnosed inferior turbinate hypertrophy (ITH) requiring surgical intervention were included. Patients were randomized into two equal groups (n=50 each) using a simple randomization method:

Group A (Turbinoplasty): Patients underwent conventional submucosal turbinoplasty.

Group B (Turbinectomy): Patients underwent 50% reduction partial turbinectomy.

Inclusion criteria were patients aged 18–50 years with persistent nasal obstruction due to ITH not responding to medical therapy.

Exclusion criteria included septal deviation, nasal polyps, sinonasal tumors, previous nasal surgery, or systemic comorbidities affecting surgical outcomes.

Preoperative Assessment

All participants underwent detailed history, clinical examination, diagnostic nasal endoscopy (DNE), and preoperative symptom assessment using the Nasal Obstruction Symptom Evaluation (NOSE) score, a validated questionnaire assessing nasal blockage severity.

Image 1: Endoscopic view demonstrating hypertrophied inferior turbinate causing significant nasal obstruction in a study participant prior to surgical intervention.

Surgical Procedure: Procedures were performed under local anesthesia. The nasal cavity was packed with 4% lignocaine and 1:10,000 adrenaline for 20 minutes, followed by infiltration of 1% lignocaine with 1:100,000 adrenaline into the hypertrophied turbinate under endoscopic guidance.

Turbinectomy: A portion of the inferior turbinate was clamped with Rochester forceps and resected with Heyman scissors, followed by hemostasis.

Turbinoplasty: A mucosal incision was placed on the inferomedial turbinate surface, and a tunnel was created to separate mucosa from the underlying bone. Excess bone with or without lateral mucosa was resected, and the mucosa was repositioned laterally. Hemostasis was secured in both groups, and nasal cavities were packed with soframycin-soaked ribbon gauze/merocels for 24 hours.

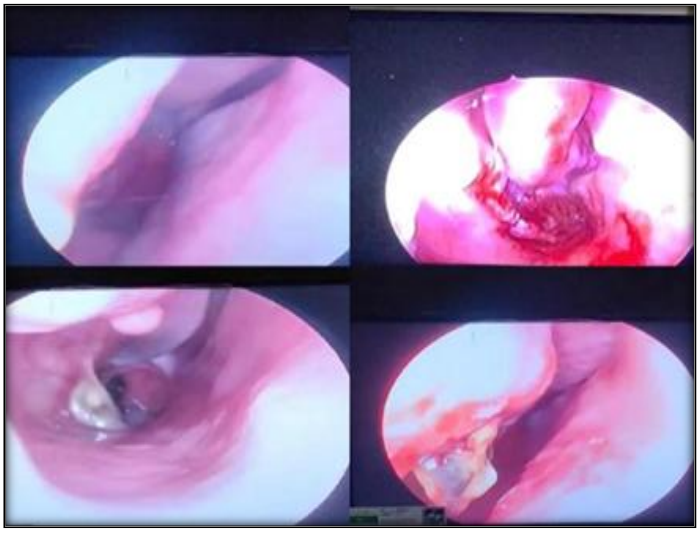

Image 2: Intraoperative endoscopic views showing different stages of inferior turbinate surgery: (A) mucosal incision and submucosal dissection, (B) resection of hypertrophied turbinate tissue, (C) exposure of turbinate bone, and (D) repositioning of mucosa following partial resection.

Postoperative Follow-up: Patients were evaluated at 15 days, 1 month, and 3 months postoperatively. The primary outcome measure was change in NOSE score across intervals. Secondary outcomes included postoperative complications such as bleeding, crusting, synechiae formation, and mucosal edema.

Statistical Analysis: Data were analyzed using SPSS version 26. Continuous variables were expressed as mean ± standard deviation, and categorical variables as frequencies and percentages. Student's *t*-test and Chi-square test were applied where appropriate. A p-value <0.05 was considered statistically significant.

Ethical Considerations: The study was conducted in accordance with the principles of the Declaration of Helsinki (2013 revision). Ethical clearance was obtained from the Institutional Ethics Committee, Guntur Medical College and Government General Hospital, Guntur, Andhra Pradesh, India (IEC No: GMC/IEC/42/2025, dated 10-04-2025). Written informed consent was obtained from all participants prior to inclusion. Confidentiality of patient data was strictly maintained, and participants were assured of their right to withdraw from the study at any stage without affecting their treatment.

Results

A total of 100 patients with inferior turbinate hypertrophy were

enrolled, with 50 undergoing turbinoplasty and 50 undergoing turbinectomy. The mean age was comparable between the groups (31.24 ± 6.2 years in the turbinoplasty group vs. 33.32 ± 6.7 years in the turbinectomy group; p>0.05). The majority of patients were within the 26–37-year age range in both groups. A slight male predominance was observed, though not statistically significant (64% males in turbinoplasty vs. 52% in turbinectomy; p>0.05) [Table 1].

Table 1: Demographic Distribution of Study Population (N = 100)

Variable	Turbinoplasty (n=50)	Turbinectomy (n=50)	p-value
Mean Age (years)	31.24 ± 6.2	33.32 ± 6.7	>0.05
Age 18–25 years	14 (28%)	9 (18%)	
Age 26–37 years	23 (46%)	26 (52%)	
Age 38–50 years	13 (26%)	15 (30%)	
Male	32 (64%)	26 (52%)	>0.05
Female	18 (36%)	24 (48%)	

Preoperative NOSE scores were similar across both groups (81.9 ± 6.8 for turbinoplasty vs. 79.0 ± 7.2 for turbinectomy; p>0.05). Postoperatively, significant improvement was seen in both cohorts, with progressive reduction in NOSE scores at 15 days, 1 month, and 3 months. Notably, turbinoplasty showed consistently lower mean NOSE scores compared to turbinectomy at all follow-up intervals (p<0.05) [Table 2].

Table 2: Comparison of Pre- and Postoperative NOSE Scores

Time Interval	Turbinoplasty (Mean ± SD)	Turbinectomy (Mean ± SD)	p-value
Preoperative	81.9 ± 6.8	79.0 ± 7.2	>0.05
Post-op (15 days)	12.0 ± 3.2	16.0 ± 4.1	<0.05
Post-op (1 month)	12.5 ± 3.1	15.0 ± 3.7	<0.05
Post-op (3 months)	10.0 ± 2.8	11.5 ± 3.0	<0.05

The distribution of NOSE score categories highlighted a marked shift toward lower scores following surgery in both groups. In the turbinoplasty arm, 72% of patients achieved a score of 0 or 1 by three months, whereas in the turbinectomy group, 92% were similarly classified. However, a small proportion of turbinectomy patients continued to demonstrate higher scores (2–4) compared with turbinoplasty, indicating a slower or less uniform recovery [Table 3].

Postoperative complications were generally mild and infrequent. Bleeding (12% vs. 4%), synechiae formation (10% vs. 4%), and crusting (8% vs. 2%) occurred more frequently following turbinectomy, although these differences did not reach statistical significance. The incidence of mucosal edema was identical in both groups (2%) [Table 4].

Table 3: Distribution of NOSE Score Categories Across Time

Group / Interval	Score 0	Score 1	Score 2	Score 3	Score 4
Turbinoplasty					
Pre-op	0	0	5	25	20
15 days Post-op	36	16	4	0	0
1 month Post-op	27	21	2	0	0
3 months Post-op	32	16	2	0	0
Turbinectomy					
Pre-op	0	0	10	22	18
15 days Post-op	30	10	8	2	0
1 month Post-op	25	20	5	0	0
3 months Post-op	31	15	4	0	0

Table 4: Postoperative Complications in Turbinoplasty vs Turbinectomy

Complication	Turbinoplasty (n=50)	Turbinectomy (n=50)	p-value
Synechiae formation	2 (4%)	5 (10%)	>0.05
Postoperative bleeding	2 (4%)	6 (12%)	>0.05
Crusting	1 (2%)	4 (8%)	>0.05
Mucosal edema	1 (2%)	1 (2%)	NS

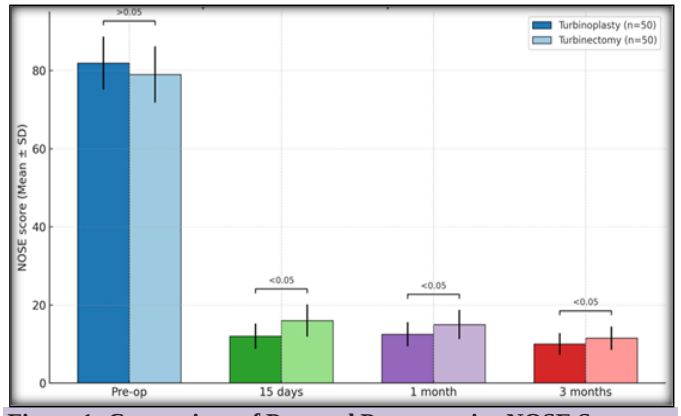

Figure 1: Comparison of Pre- and Postoperative NOSE Scores

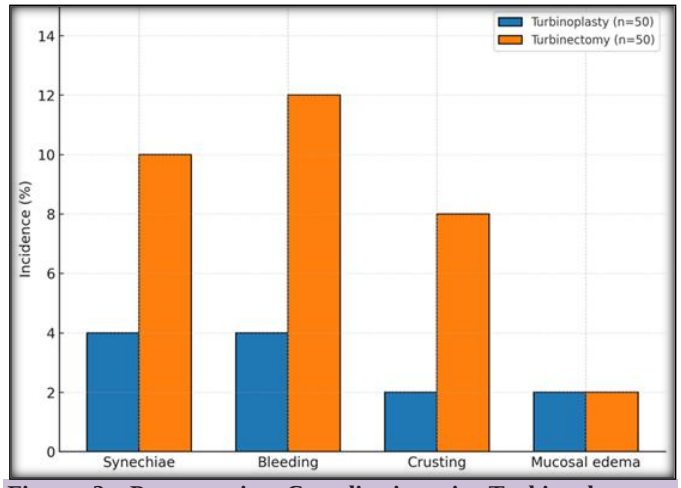

Figure 2: Postoperative Complications in Turbinoplasty vs Turbinectomy

Discussion

Inferior turbinate hypertrophy (ITH) is a major contributor to chronic nasal obstruction, and surgical intervention is often required when medical management fails. In the present study, both turbinectomy and turbinoplasty significantly improved symptoms, as reflected by reductions in NOSE scores at 15 days, 1 month, and 3 months. These findings confirm that surgical reduction of inferior turbinates is effective in restoring nasal patency and improving quality of life, consistent with previous trials demonstrating the benefits of inferior turbinate surgery.[6,7]

Our results indicate that patients undergoing turbinoplasty achieved consistently lower postoperative NOSE scores compared with turbinectomy, reflecting more sustained and uniform improvement. This aligns with reports by Easa et al., who demonstrated that submucosal resection turbinoplasty provided superior symptom control compared to partial turbinectomy.[7] Similarly, studies using quality-of-life tools such as the SNOT-22 have highlighted the additional improvement achieved with turbinate surgery as an adjunct to functional nasal procedures.[8]

Complication rates in our study further support the preference for turbinoplasty. Although differences were not statistically significant, bleeding, synechiae formation, and crusting occurred more frequently in turbinectomy patients. This observation mirrors the findings of Garcia et al., who reported fewer rhinitis-related symptoms and complications when mucosa-preserving techniques were used.[12] Turbinoplasty minimizes mucosal trauma, thereby preserving mucociliary clearance and reducing postoperative morbidity. The efficacy of turbinoplasty in allergic rhinitis and isolated ITH has also been corroborated in Indian studies.[13]

Our operative time was slightly longer for turbinoplasty compared to turbinectomy, which reflects its technically more demanding nature. However, the functional advantages outweigh this limitation. Verkest et al. similarly observed better long-term outcomes with piezo-assisted turbinoplasty compared to partial turbinectomy, underscoring the value of mucosal-sparing approaches.[11] Recent studies also reveal a global trend favoring conservative techniques, with national surgical databases showing a decline in aggressive resection and increased adoption of functional preservation methods.[10] Taken together, these findings reaffirm that while both techniques are effective, turbinoplasty offers superior long-term benefits and fewer complications. Its role as a mucosa-sparing procedure is increasingly emphasized in contemporary literature, and its efficacy has been validated across diverse populations and surgical contexts.[6–13]

Conclusion

This prospective study compared outcomes of turbinectomy and turbinoplasty in adults with inferior turbinate hypertrophy. Both procedures provided significant symptomatic relief, as demonstrated by reduced NOSE scores postoperatively. However, turbinoplasty patients experienced greater and more sustained improvement in nasal obstruction, with lower complication rates compared to turbinectomy. Although turbinoplasty required slightly longer operative time, its mucosal-sparing nature minimized postoperative bleeding, synechiae, and crusting, thereby preserving nasal physiology more effectively. Overall, turbinoplasty emerges as a safer and more beneficial option, particularly for long-term management of nasal obstruction. Nevertheless, the choice of surgical approach should be individualized, based on patient profile and surgeon expertise.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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