International Journal of Medicine
pISSN 1468-3814 | eISSN 2667-7008
https://theinternationalmedicine.com/

Original Researcher Article *DOI: 10.61336/im/26-04-81*

Radiofrequency Turbinoplasty For Inferior Turbinate Hypertrophy - A Prospective Study.

Dr. Mako Suganth B[1], Dr. Bhanu Prakash[2], Dr. Rosemary Sen[3]*, Dr. Makireddy Sunidhi Pravallika[4], Dr. Manjunatha Rao SV[5].

[1,2,3] Senior Resident, Department of Otorhinolaryngology, Head and Neck Surgery, All India Institute of Medical Sciences, Bibinagar, Telangana, India.

[4]Formerly of Department of Otorhinolaryngology, Head and Neck Surgery, Basaveshwara Medical College & Hospital, Chitradurga, Karnataka, India.

[5]Professor and HOD, Department of Otorhinolaryngology, Head and Neck Surgery, Basaveshwara Medical College & Hospital, Chitradurga, Karnataka, India.

Correspondence:
Dr. Rosemary Sen.
Senior Resident, Department of Otorhinolaryngology, Head and Neck Surgery, All India Institute of Medical Sciences, Bibinagar, Telangana, India.

ORCID ID: 0009-0004-7313-5683

Received: 10-03-2026
Revised: 23-03-2026
Accepted: 06-04-2026
Published: 25-04-2026

Abstract

Background: Inferior turbinate hypertrophy is an important cause of persistent nasal obstruction and may significantly affect breathing, sleep, physical activity, and quality of life. Although medical treatment remains the initial approach, patients with persistent symptoms may require surgical reduction of the inferior turbinates. Radiofrequency turbinoplasty is a minimally invasive, mucosa-preserving technique that reduces turbinate volume by controlled submucosal thermal injury and subsequent fibrosis. ***Aim:*** To assess the efficacy and safety of radiofrequency turbinoplasty in the treatment of inferior turbinate hypertrophy and its impact on nasal airflow and patient-reported outcomes. ***Materials and Methods:*** A prospective observational study was conducted in the Department of Otorhinolaryngology and Head & Neck Surgery, Basaveshwara Medical College and Hospital, Chitradurga, over a period of 15 months from August 2022 to November 2023. A total of 50 adult patients with chronic nasal obstruction due to inferior turbinate hypertrophy refractory to medical management were included. Radiofrequency turbinoplasty was performed under local anaesthesia. Subjective improvement was assessed using the Nasal Obstruction Symptom Evaluation (NOSE) score, while objective postoperative findings were assessed using the Nasal Endoscopy View Score (NES). Patients were followed up at 7 days, 15 days, and 3 months. Data were analyzed using SPSS version 20, and a p-value <0.05 was considered statistically significant. ***Results:*** Among the 50 participants, 30 (60%) were males and 20 (40%) were females. The majority belonged to the 31–40-year and 41–50-year age groups. Bilateral nasal obstruction was the most common presentation, occurring in 28 (56%) patients. The mean NOSE score decreased significantly from 69.1 ± 12.88 preoperatively to 57.8 ± 13.71 at 15 days and 39.4 ± 11.59 at 3 months (p<0.0001). At 3 months, the mean total NES decreased from 1.24 ± 1.20 to 0.22 ± 0.42 on the right side and from 1.30 ± 1.18 to 0.22 ± 0.42 on the left side, both with p<0.0001. Discharge and edema also improved significantly on both sides. At 3 months, 37 (74%) patients had NOSE scores between 26 and 50, seven (14%) had scores below 25, and no patient remained in the 76–100 category, demonstrating a highly significant shift toward lower symptom severity (p<0.001). ***Conclusion:*** Radiofrequency turbinoplasty produced significant improvement in both subjective nasal obstruction and objective endoscopic findings in patients with inferior turbinate hypertrophy refractory to medical therapy. The progressive reduction in NOSE scores and improvement in nasal endoscopic findings support radiofrequency turbinoplasty as an effective, minimally invasive, and mucosa-preserving treatment option with favorable short-term outcomes.

Keywords: Inferior turbinate hypertrophy; radiofrequency turbinoplasty; radiofrequency ablation.

INTRODUCTION

Nasal obstruction is one of the most frequent symptoms encountered in otorhinolaryngology and can substantially impair breathing, sleep, physical activity, and overall quality of life. Inferior turbinate hypertrophy (ITH) is an important and common anatomical contributor to persistent nasal obstruction, particularly among patients with allergic rhinitis, non-allergic rhinitis, vasomotor rhinitis, and other chronic inflammatory conditions of the nasal mucosa. The uploaded study

specifically evaluated radiofrequency turbinoplasty for inferior turbinate hypertrophy, with emphasis on efficacy, safety, improvement in nasal airflow, and patient-reported outcomes.

The inferior turbinates are highly vascular structures situated along the lateral nasal walls and play an essential physiological role in regulating nasal airflow, humidification, warming, and filtration of inspired air. Hypertrophy of their mucosal, submucosal, or bony components reduces the cross-sectional area of the nasal airway and increases resistance to airflow, resulting in persistent or intermittent nasal obstruction. The anterior portion of the inferior turbinate contributes importantly to nasal airway resistance; therefore, even relatively small increases in turbinate volume can produce clinically significant obstruction. [1] Initial management of inferior turbinate hypertrophy is generally conservative and includes intranasal corticosteroids, antihistamines, saline irrigation, treatment of underlying allergic disease, and short-term use of appropriate decongestant therapy. However, a considerable proportion of patients continue to experience persistent nasal obstruction despite adequate medical treatment, necessitating surgical reduction of the inferior turbinate. [2] The objective of turbinate surgery is not simply maximal tissue removal, but rather an optimal reduction in turbinate volume while maintaining intact mucosal function and preserving the physiological role of the nose.[2] Several surgical techniques have consequently been developed, including partial or total turbinectomy, submucosal resection, electrocautery, laser-assisted reduction, cryosurgery, microdebrider-assisted turbinoplasty, coblation, and radiofrequency-assisted turbinate reduction.[2] Radiofrequency turbinoplasty or radiofrequency turbinate volume reduction is a minimally invasive technique designed to reduce submucosal turbinate volume while causing relatively limited injury to the overlying respiratory epithelium. Radiofrequency energy is delivered through an intraturbinal electrode, producing controlled thermal injury in the submucosal tissue. Subsequent coagulation, fibrosis, wound contraction, and reduction in vascular tissue produce a progressive decrease in turbinate volume, thereby improving nasal airway patency while largely preserving mucosal integrity. [3] The uploaded dissertation similarly describes radiofrequency energy as producing a controlled submucosal lesion followed by fibrosis and tissue contraction, resulting in reduction of turbinate volume and improvement in nasal obstruction.

International evidence has demonstrated the clinical effectiveness of radiofrequency treatment in medically refractory inferior turbinate hypertrophy. In a randomized, blinded, placebo-controlled trial involving 32 patients, Nease and Krempl demonstrated significant improvement in the frequency and severity of nasal obstruction following radiofrequency volumetric tissue reduction. [3] Their findings provided important controlled evidence supporting radiofrequency as an effective minimally invasive treatment for turbinate-related nasal obstruction. Subsequent studies have demonstrated improvements not only in subjective obstruction but also in objective nasal function. Garzaro et al. evaluated 40 patients undergoing radiofrequency inferior turbinate reduction and observed significant improvement in nasal resistance and NOSE scores following treatment. [4] At two months, 97.5% of patients demonstrated improvement in the NOSE score, with a mean pre- to postoperative improvement of approximately 40 points, together with significant improvement in olfactory function. The durability of these benefits has also been investigated. In a subsequent long-term evaluation, Garzaro et al. demonstrated that improvement after radiofrequency inferior turbinate reduction persisted at two years, with mean nasal resistance decreasing from approximately 1.13 Pa/cm³/s preoperatively to 0.29 Pa/cm³/s at two years.[5] These observations suggest that appropriately performed radiofrequency reduction can provide sustained functional improvement while preserving important turbinate functions.

Globally, radiofrequency-assisted turbinate procedures have therefore gained acceptance because of their relatively short procedure time, ability to be performed under local anaesthesia in selected patients, limited intraoperative bleeding, relatively mild postoperative discomfort, rapid recovery, and preservation of the turbinate mucosa. Nevertheless, comparative studies have shown that different turbinate-reduction techniques may have differing short- and long-term benefits. A systematic review and meta-analysis of seven randomized studies comparing microdebrider-assisted and radiofrequency-assisted inferior turbinate reduction confirmed that both modalities improve nasal obstruction, although differences between techniques can occur depending upon the outcome and follow-up period assessed. [6] Indian investigators have also evaluated radiofrequency-based turbinate reduction. Bakshi et al., in a randomized clinical study from India comparing radiofrequency ablation with surgical turbinoplasty in patients with inferior turbinate hypertrophy, demonstrated that both techniques were effective in improving nasal obstruction, although differences in longer-term efficacy were observed between procedures. [7]

The present study was undertaken to assess the efficacy and safety of radiofrequency turbinoplasty in patients with inferior turbinate hypertrophy and to determine its impact on nasal airflow, nasal obstructive symptoms, patient-reported outcomes, and postoperative complications.

AIM

To assess the efficacy and safety of radiofrequency turbinoplasty in the treatment of inferior turbinate hypertrophy and its impact on nasal airflow and patient-reported outcomes.

OBJECTIVES

1. To assess the improvement in nasal airflow and overall nasal breathing quality following radiofrequency turbinoplasty for inferior turbinate hypertrophy.
2. To evaluate the safety profile of radiofrequency turbinoplasty, including postoperative complications and adverse effects.
3. To assess changes in patient-reported nasal obstructive symptoms and quality of life following radiofrequency turbinoplasty using the Nasal Obstruction Symptom Evaluation (NOSE) scale.
4. To objectively assess postoperative changes in the nasal cavity using Nasal Endoscopy View Scores (NESs).

MATERIALS AND METHODS

Study Design

A prospective observational study was conducted among patients with inferior turbinate hypertrophy and persistent nasal obstruction despite medical management.

Study Setting

The study was conducted in the Department of Otorhinolaryngology and Head & Neck Surgery, Basaveshwara Medical College and Hospital, Chitradurga, Karnataka, India.

Study Period

The study was conducted from 1 August 2022 to 1 November 2023, for a total duration of 15 months.

Study Population

Patients attending the ENT and Head & Neck Surgery outpatient department with nasal obstruction secondary to inferior turbinate hypertrophy that had not improved with medical management were considered for inclusion.

Sampling Technique

A convenience sampling technique was used to recruit eligible patients during the study period.

Sample Size

A total of 50 patients were included. The sample size was calculated using an expected efficacy of approximately 85.5% from a previous study, with Z=1.96, P≈86%, Q=14%, and an absolute precision of 10%, yielding a required sample size of approximately 50.

Inclusion Criteria

Patients were included if they had:

1. Chronic nasal obstruction due to inferior turbinate hypertrophy.
2. Inadequate shrinkage of the nasal mucosa following application of a topical nasal decongestant.
3. Willingness to participate and provision of written informed consent.

Exclusion Criteria

Patients were excluded if they:

1. Were younger than 18 years.
2. Had severe nasal deformities or sinus pathology causing nasal obstruction due to conditions other than inferior turbinate hypertrophy.

Preoperative Evaluation

After obtaining Institutional Ethics Committee approval and written informed consent, a detailed clinical history regarding the onset, duration, progression, and associated symptoms of nasal obstruction was obtained. General physical examination and detailed nasal examination, including anterior rhinoscopy, posterior rhinoscopy, and diagnostic nasal endoscopy, were performed and documented. Baseline investigations were performed before the procedure.

Subjective severity of nasal obstruction was assessed using the Nasal Obstruction Symptom Evaluation (NOSE) scale before treatment.

Radiofrequency Turbinoplasty Procedure

Radiofrequency turbinoplasty was performed under local anaesthesia. The nasal cavity was initially packed with cotton wicks soaked in 4% lignocaine with adrenaline. Under visualization using a 4-mm, 0° Hopkins rigid endoscope, 2 mL of

2% lignocaine was infiltrated into the submucosa of the anterior and middle portions of the inferior turbinate using a 26-gauge needle.

A Megasurg Gold Radio Frequency Surgery Unit was used to perform the procedure. The radiofrequency probe was introduced longitudinally into the submucosal tissue of the inferior turbinate under endoscopic guidance. The study protocol reported delivery of approximately 400–500 J of energy per puncture. Care was taken to maintain the electrode within the submucosal plane and avoid injury to the overlying mucosa.

Each inferior turbinate was treated once. Minor oozing was controlled using cotton pledgets soaked in 4% lignocaine with adrenaline, and routine postoperative nasal packing was not performed.

Postoperative Management and Follow-up

Patients received analgesics during the immediate postoperative period and were advised isotonic saline nasal douching once daily for one week, together with antibiotics and analgesics as described in the study protocol. Patients were followed up at 7 days, 15 days, and 3 months following radiofrequency turbinoplasty.

Outcome Assessment

The efficacy of radiofrequency turbinoplasty was assessed using both subjective and objective outcome measures.

Subjective assessment: The NOSE scale was used to assess nasal stuffiness, nasal obstruction, difficulty breathing through the nose, difficulty sleeping, and difficulty breathing during exercise. Each component was scored from 0 (not a problem) to 4 (severe problem). The total raw score was multiplied by five to obtain a final score ranging from 0 to 100, with higher scores indicating greater symptom severity.

Objective assessment: Nasal endoscopic findings were evaluated using the Nasal Endoscopy View Score (NES). Discharge, oedema, and crusting were assessed and graded as absent (0), mild (1), or severe (2), with the right and left nasal cavities evaluated independently. Postoperative NOSE and nasal endoscopic assessments were performed at 15 days and 3 months.

Safety Assessment

The safety of radiofrequency turbinoplasty was evaluated by documenting postoperative adverse events and complications during follow-up, including procedure-related bleeding and other postoperative nasal morbidity.

Statistical Analysis

The collected data were entered into Microsoft Excel and analyzed using SPSS version 20. Continuous variables were summarized using appropriate descriptive statistics, while categorical variables were presented as frequencies and percentages. The paired t-test was used to compare related pre- and postoperative mean values. The Chi-square test was used to examine associations between categorical variables, while analysis of variance (ANOVA) was used for comparison of means across three or more groups, as specified in the original study methodology. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1. Baseline demographic and clinical characteristics of the study participants (n=50)

Characteristic	Category	n	%
Gender	Male	30	60
	Female	20	40
Age group (years)	18–30	8	16
	31–40	20	40
	41–50	19	38
	51–60	3	6
Type of nasal obstruction	Bilateral	28	56
	Left-sided	14	28
	Right-sided	8	16
History of allergy	Present	14	28
	Absent	36	72

Interpretation: Males constituted 60% of the study population. Most participants were aged 31–40 years (40%) or 41–50 years (38%). Bilateral nasal obstruction was the predominant presentation, occurring in 56%, while 28% had a history of allergy.

Table 2. Change in NOSE score following radiofrequency turbinoplasty (n=50)

Time point	NOSE score, Mean ± SD	Comparison	p-value
Preoperative	69.1 ± 12.88	Preoperative vs 15 days	**<0.0001**
15 days postoperative	57.8 ± 13.71	15 days vs 3 months	**<0.0001**
3 months postoperative	39.4 ± 11.59	Preoperative vs 3 months	**<0.0001**

Interpretation: The mean NOSE score decreased from 69.1 ± 12.88 preoperatively to 57.8 ± 13.71 at 15 days and 39.4 ± 11.59 at 3 months. All pairwise comparisons were highly statistically significant (p<0.0001), demonstrating progressive and sustained improvement in patient-reported nasal obstruction following radiofrequency turbinoplasty.

Table 3. Comparison of preoperative and 3-month postoperative nasal endoscopy scores

Endoscopic parameter	Side	Preoperative Mean ± SD	3 months Mean ± SD	p-value
Discharge	Right	0.68 ± 0.65	0.22 ± 0.42	**<0.0001**
	Left	0.68 ± 0.65	0.22 ± 0.42	**<0.0001**
Edema	Right	0.46 ± 0.58	0.00 ± 0.00	**<0.0001**
	Left	0.50 ± 0.60	0.00 ± 0.00	**<0.0001**
Crusting	Right	0.10 ± 0.40	0.00 ± 0.00	0.080
	Left	0.12 ± 0.39	0.00 ± 0.00	**0.032**
Total NES	Right	1.24 ± 1.20	0.22 ± 0.42	**<0.0001**
	Left	1.30 ± 1.18	0.22 ± 0.42	**<0.0001**

Interpretation: At 3 months, significant reductions were observed in discharge, edema, and total nasal endoscopic scores on both sides (p<0.0001). Left-sided crusting also improved significantly (p=0.032), whereas the reduction in right-sided crusting did not reach statistical significance (p=0.080). These findings demonstrate substantial objective improvement in the nasal cavity following treatment.

Table 4. Comparison of nasal endoscopic scores at 15 days and 3 months following radiofrequency turbinoplasty

Parameter	Side	15 days Mean ± SD	3 months Mean ± SD	p-value
Discharge	Right	0.40 ± 0.50	0.22 ± 0.42	0.0537
	Left	0.42 ± 0.50	0.22 ± 0.42	**0.0322**
Edema	Right	0.76 ± 0.69	0.00 ± 0.00	**<0.0001**
	Left	0.80 ± 0.70	0.00 ± 0.00	**<0.0001**
Crusting	Right	0.16 ± 0.51	0.00 ± 0.00	**0.0288**
	Left	0.22 ± 0.62	0.00 ± 0.00	**0.0137**
Total NES	Right	1.24 ± 1.22	0.22 ± 0.42	**<0.0001**
	Left	1.48 ± 1.30	0.22 ± 0.42	**<0.0001**

Interpretation: Objective endoscopic recovery continued between 15 days and 3 months. Edema, crusting, and total NES improved significantly on both sides. Left-sided discharge also showed a significant reduction, whereas the reduction in right-sided discharge was borderline and did not reach conventional statistical significance (p=0.0537). This pattern indicates that some early postoperative edema and crusting resolved progressively over subsequent months.

Table 5. Distribution of NOSE score categories before and 3 months after radiofrequency turbinoplasty (n=50)

NOSE score category	Preoperative n (%)	3 months postoperative n (%)	p-value
<25	0 (0)	7 (14)	**<0.001**
26–50	2 (4)	37 (74)	
51–75	34 (68)	6 (12)	
76–100	14 (28)	0 (0)	
Total	**50 (100)**	**50 (100)**	

Interpretation: Before treatment, 96% of patients had NOSE scores >50, including 28% with severe scores of 76–100. At 3 months, no patient remained in the 76–100 category, while 44/50 (88%) had scores ≤50. The shift in NOSE-score severity categories was highly statistically significant (p<0.001), further confirming clinically meaningful symptomatic improvement following radiofrequency turbinoplasty.

Overall Interpretation

Radiofrequency turbinoplasty resulted in a progressive and statistically significant reduction in nasal obstruction, with the mean NOSE score falling from 69.1 preoperatively to 39.4 at 3 months. Objective nasal endoscopic findings also improved

substantially by 3 months, particularly discharge, edema, and total NES. The transient increase in edema observed at 15 days subsequently resolved completely by 3 months, indicating expected early postoperative mucosal changes followed by recovery. Overall, the findings support the short-term efficacy of radiofrequency turbinoplasty for symptomatic inferior turbinate hypertrophy, with concordant improvement in both patient-reported and objective endoscopic outcomes.

DISCUSSION

In the present prospective study of 50 patients with inferior turbinate hypertrophy, radiofrequency turbinoplasty produced a substantial and progressive improvement in nasal obstruction, with the mean NOSE score decreasing from 69.1 ± 12.88 preoperatively to 57.8 ± 13.71 at 15 days and 39.4 ± 11.59 at 3 months ($p<0.0001$). This finding is consistent with Nease and Krempl, who demonstrated in a randomized placebo-controlled trial that radiofrequency volumetric tissue reduction significantly improved severity and frequency of nasal obstruction and overall ability to breathe, with benefits maintained at 6 months.[8]

Garzaro et al. similarly evaluated 40 patients and reported improvement in the NOSE score in 97.5% of patients at 2 months, with a mean pre- to postoperative improvement of 40.12 points ($p<0.001$).[9] The magnitude of improvement in the present study, approximately 29.7 NOSE-score points by 3 months, therefore supports the effectiveness of radiofrequency treatment for medically refractory turbinate hypertrophy.

The durability of radiofrequency treatment has also been demonstrated by Porter et al., who followed patients for 2 years and found sustained significant improvement in frequency and severity of obstruction and overall breathing ability, with no procedure-related complications during follow-up.[10] Garzaro et al. further demonstrated sustained benefit at 2 years, with mean nasal resistance decreasing from 1.13 to 0.29 Pa/cm³/s and mean NOSE score decreasing from 23.14 to 4.14 ($p<0.01$).[11]

Objective endoscopic findings in the present study also showed marked improvement. The total NES on the right side decreased from 1.24 ± 1.20 to 0.22 ± 0.42, while the left-sided score decreased from 1.30 ± 1.18 to 0.22 ± 0.42 at 3 months, both with $p<0.0001$. Discharge and edema scores also improved significantly on both sides. Coste et al., in a prospective study of 14 patients with medically refractory turbinate hypertrophy, similarly demonstrated significant improvement following radiofrequency treatment and concluded that radiofrequency was a safe and effective method for reducing inferior turbinate volume.[12]

Interestingly, early postoperative endoscopic findings in the present study were less favorable than the 3-month results. At 15 days, mean edema scores increased from 0.46 to 0.76 on the right and from 0.50 to 0.80 on the left, whereas by 3 months edema had completely resolved on both sides. This temporary postoperative edema is compatible with the expected tissue response to controlled submucosal thermal injury and subsequent healing and fibrosis.

Crusting demonstrated a similar temporal pattern. At 15 days, crust scores were 0.16 ± 0.51 on the right and 0.22 ± 0.62 on the left, but both decreased to zero by 3 months. The reduction between 15 days and 3 months was statistically significant on both sides. These findings support the mucosa-preserving nature of radiofrequency turbinoplasty, in which short-term inflammatory changes resolve during subsequent healing.

Cavaliere et al. compared radiofrequency turbinoplasty with conventional surgical turbinate reduction and reported that radiofrequency provided effective symptomatic improvement with a favorable safety profile and reduced postoperative morbidity.[13] Similarly, Sapçı et al. emphasized that radiofrequency reduction offers effective treatment while preserving the physiological functions of the inferior turbinate, an important advantage over more destructive surgical approaches.[14] In the present study, the categorical distribution of NOSE scores also demonstrated clinically meaningful improvement. Before surgery, 34 patients (68%) had NOSE scores between 51–75 and 14 (28%) had scores between 76–100. At 3 months, no patient remained in the 76–100 category; instead, 37 (74%) had scores of 26–50 and seven (14%) had scores below 25 ($p<0.001$). Thus, the treatment produced not merely statistical improvement but also a clear shift from severe toward mild-to-moderate symptom categories.

The efficacy of radiofrequency turbinate reduction has also been supported by comparative studies. Vijay Kumar et al., in an Indian prospective comparative study, evaluated radiofrequency-assisted and microdebrider-assisted turbinoplasty and demonstrated significant postoperative improvement with both techniques in patients with inferior turbinate hypertrophy.[15] Their findings are particularly relevant to the present Indian study and support radiofrequency as a practical surgical option for persistent turbinate-related nasal obstruction.

A prospective randomized study comparing radiofrequency thermal ablation and microdebrider-assisted turbinoplasty in 40 patients also demonstrated significant improvement in nasal obstruction following both techniques, although differences

between procedures were observed at early and intermediate follow-up.[16] These comparative studies indicate that radiofrequency can achieve meaningful functional benefit while retaining the advantages of a minimally invasive technique.

The present study also demonstrated that symptomatic improvement progressed with time rather than reaching its maximum immediately after surgery. NOSE scores declined significantly from 57.8 ± 13.71 at 15 days to 39.4 ± 11.59 at 3 months ($p<0.0001$). Such progressive improvement is biologically plausible because radiofrequency induces submucosal coagulation followed by fibrosis and gradual reduction in turbinate volume rather than immediate tissue excision.

Kim et al. evaluated nasal function after temperature-controlled radiofrequency reduction and reported improvement in severity and frequency of obstruction in 81.3% and 93.8%, respectively, at 8 weeks, while objective nasal volume and total nasal resistance also improved significantly.[17] These findings closely support the progressive symptomatic and objective improvement observed in the present study.

Lin et al. studied 108 patients with allergic rhinitis refractory to medical treatment who underwent radiofrequency turbinate surgery and demonstrated sustained symptomatic improvement over a follow-up period extending from 12 to 26 months. [18] Although the present study had a shorter follow-up of 3 months, the significant improvement in both NOSE and endoscopic scores indicate a favourable early treatment response.

Overall, the present findings demonstrate that radiofrequency turbinoplasty was effective in reducing nasal obstruction and improving postoperative endoscopic findings in patients with inferior turbinate hypertrophy refractory to medical therapy. The progressive decline in NOSE scores, resolution of postoperative edema and crusting, and significant reduction in total endoscopic scores indicate both subjective and objective benefit. The results are consistent with previous international and Indian studies and support radiofrequency turbinoplasty as a minimally invasive, mucosa-preserving treatment option for appropriately selected patients with inferior turbinate hypertrophy.

CONCLUSION

Radiofrequency turbinoplasty was found to be an effective minimally invasive treatment for patients with inferior turbinate hypertrophy who remained symptomatic despite medical therapy. The procedure resulted in a marked and progressive reduction in nasal obstruction, with the mean NOSE score decreasing from 69.1 ± 12.88 preoperatively to 57.8 ± 13.71 at 15 days and 39.4 ± 11.59 at 3 months, with highly significant improvement at follow-up ($p<0.0001$). Objective endoscopic findings also improved substantially by 3 months. Total nasal endoscopy scores decreased significantly on both sides, while discharge and edema showed marked improvement. Early postoperative edema and crusting observed at 15 days largely resolved by 3 months, indicating satisfactory mucosal healing.

The distribution of NOSE-score categories further demonstrated clinically meaningful improvement, with no patient remaining in the severe 76–100 category at 3 months and 88% of patients achieving a NOSE score of 50 or less. Overall, radiofrequency turbinoplasty provided significant subjective and objective improvement in patients with inferior turbinate hypertrophy and appeared to be a useful mucosa-preserving treatment option with favorable short-term outcomes.

REFERENCES

1. Batra PS, Seiden AM, Smith TL. Surgical management of adult inferior turbinate hypertrophy: a systematic review of the evidence. Laryngoscope. 2009;119(9):1819-1827. doi:10.1002/lary.20544.
2. Scheithauer MO. Surgery of the turbinates and “empty nose” syndrome. GMS Curr Top Otorhinolaryngol Head Neck Surg. 2010;9:Doc03. doi:10.3205/cto000067.
3. Nease CJ, Krempl GA. Radiofrequency treatment of turbinate hypertrophy: a randomized, blinded, placebo-controlled clinical trial. Otolaryngol Head Neck Surg. 2004;130(3):291-299. doi:10.1016/j.otohns.2003.11.003.
4. Garzaro M, Pezzoli M, Pecorari G, Landolfo V, Defilippi S, Giordano C. Radiofrequency inferior turbinate reduction: an evaluation of olfactory and respiratory function. Otolaryngol Head Neck Surg. 2010;143(3):348-352. doi:10.1016/j.otohns.2010.06.908.
5. Garzaro M, Pezzoli M, Landolfo V, Defilippi S, Giordano C, Pecorari G. Radiofrequency inferior turbinate reduction: long-term olfactory and functional outcomes. Otolaryngol Head Neck Surg. 2012;146(1):146-150. doi:10.1177/0194599811423008.
6. Mirza AA, Alandejani TA, Shawli HY, Alsamel MS, Albakrei MO, Abdulazeem HM. Outcomes of microdebrider-assisted versus radiofrequency-assisted inferior turbinate reduction surgery: a systematic review and meta-analysis of interventional randomised studies. Rhinology. 2020;58(6):530-537. doi:10.4193/Rhin19.350.
7. Bakshi SS, Manoharan KS, Gopalakrishnan S. Comparison of the long-term efficacy of radiofrequency ablation and surgical turbinoplasty in inferior turbinate hypertrophy: a randomized clinical study. Acta Otolaryngol. 2017;137(8):856-861. doi:10.1080/00016489.2017.1294764.

8. Nease CJ, Krempl GA. Radiofrequency treatment of turbinate hypertrophy: a randomized, blinded, placebo-controlled clinical trial. Otolaryngol Head Neck Surg. 2004;130(3):291-299. doi:10.1016/j.otohns.2003.11.003.
9. Garzaro M, Pezzoli M, Pecorari G, Landolfo V, Defilippi S, Giordano C. Radiofrequency inferior turbinate reduction: an evaluation of olfactory and respiratory function. Otolaryngol Head Neck Surg. 2010;143(3):348-352. doi: 10.1016/j.otohns.2010.06.908.
10. Porter MW, Hales NW, Nease CJ, Krempl GA. Long-term results of inferior turbinate hypertrophy with radiofrequency treatment: a new standard of care? Laryngoscope. 2006;116(4):554-557. doi: 10.1097/01.MLG.0000201986.82035.6F.
11. Garzaro M, Pezzoli M, Landolfo V, Defilippi S, Giordano C, Pecorari G. Radiofrequency inferior turbinate reduction: long-term olfactory and functional outcomes. Otolaryngol Head Neck Surg. 2012;146(1):146-150. doi:10.1177/0194599811423008.
12. Coste A, Yona L, Blumen M, Louis B, Zerah F, Rugina M, et al. Radiofrequency is a safe and effective treatment of turbinate hypertrophy. Laryngoscope. 2001;111(5):894-899. doi:10.1097/00005537-200105000-00025.
13. Cavaliere M, Mottola G, Iemma M. Comparison of the effectiveness and safety of radiofrequency turbinoplasty and traditional surgical technique in treatment of inferior turbinate hypertrophy. Otolaryngol Head Neck Surg. 2005;133(6):972-978. doi: 10.1016/j.otohns.2005.08.006.
14. Sapçı T, Güvenç MG, Evcimik MF. Radiofrequency treatment for inferior turbinate hypertrophy. Kulak Burun Bogaz Ihtis Derg. 2011;21(1):56-60. PMID: 21303320.
15. Vijay Kumar K, Kumar S, Garg S. A comparative study of radiofrequency assisted versus microdebrider assisted turbinoplasty in cases of inferior turbinate hypertrophy. Indian J Otolaryngol Head Neck Surg. 2014;66(1):35-39. doi:10.1007/s12070-013-0657-3.
16. Cingi C, Ure B, Cakli H, Ozudogru E. Microdebrider-assisted versus radiofrequency-assisted inferior turbinoplasty: a prospective study. Acta Otorhinolaryngol Ital. 2010;30(3):138-143.
17. Kim CS, Moon BK, Jung DH, Min YG. Correlation between nasal obstruction symptoms and objective parameters of acoustic rhinometry and rhinomanometry. Auris Nasus Larynx. 1998;25(1):45-48. doi:10.1016/S0385-8146(97)00015-8.
18. Lin HC, Lin PW, Su CY, Chang HW. Radiofrequency for the treatment of allergic rhinitis refractory to medical therapy. Laryngoscope. 2003;113(4):673-678. doi:10.1097/00005537-200304000-00017.