**Original research article**

# A Comparative Study of Turbinectomy Versus Turbinoplasty in a Tertiary Care Teaching Hospital

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## Abstract

**Background:** Nasal obstruction is the common presentation of the underlying pathology. Inferior turbinate hypertrophy is the leading cause of nasal obstruction. The inferior turbinate hypertrophy can be diagnosed by anterior rhinoscopic examination. Nasal endoscopy may be used to confirm the cases of complete turbinate hypertrophy. The present study aimed to compare the surgical results of conventional inferior turbinectomy with turbinoplasty.

**Methods:** The patients with hypertrophied Inferior Turbinate were selected for the study. Investigations included ECG, Chest X-ray, CT of paranasal sinuses were obtained to rule out osteomeatal complex involvement. Laboratory investigations done were CBP, ESR, Platelet counts, bleeding time, Clotting Time, Renal function tests, HIV, HBsAg. A standard operative procedure was used for conventional turbinectomy and Microdebrider assisted Inferior turbinoplasty.

**Results:** Out of n=50 cases in the study the important complaints found were nasal obstruction in 100% of the cases, sneezing was the complaint in 76% of cases and rhinorrhoea was 64% of cases, and breathing difficulty was found in 100% cases. The postoperative evaluation of the cases was done by DNE & found no cases of inferior turbinate hypertrophy. DNS was found in 50% of cases; in n=1 case of microdebrider assisted turbinoplasty and n=2 cases of conventional turbinectomy concha bullosa was found in n=6(12%) cases of the study.

**Conclusion:** The current study concludes that both turbinectomy and turbinoplasty have almost similar success rates. However, turbinectomy removes a substantial portion of the inferior turbinate and gives symptomatic relief instantly in the postoperative period. The incidences of synechiae and crusting are considerably more in conventional turbinectomy. The current results did not indicate any superiority of turbinectomy over turbinoplasty and vice versa.

**Keywords**: Inferior Turbinate Hypertrophy, Inferior Turbinectomy, Inferior Turbinoplasty, Nasal obstruction.

## Introduction

One of the most prevalent causes of nasal blockage is inferior turbinate hypertrophy. [1] The eighth most common operation done by an otorhinolaryngologist is surgery on the inferior turbinates. Conchal bone makes up the inferior turbinate. It is a distinct bone with erectile tissue and ciliated pseudostratified columnar epithelium that is covered by lamina propria. Congestion of the inferior turbinates is controlled by the autonomic nervous system. [2] The nasal cycle occurs every 4 to 12 hours due to cyclic modification of inferior turbinate vasculature. The internal nasal valve's posterior side is formed by its anterior head. [3] It provides 50% resistance to airflow during inspiration. Rhinitis of diverse etiologies, including allergic, infective, vasomotor, hormonal, and medication-induced rhinitis, causes inferior turbinate hypertrophy. [4] Medical therapy, such as topical or systemic corticosteroids, antihistamines, and decongestants, works effectively for most patients. Long-term irreversible hypertrophy that develops unexpectedly may necessitate surgical intervention. [5] It also plays a role in functional blockage, in addition to mechanical obstruction. The perception of airflow is influenced by airway resistance, with high or low resistance resulting in subjective nasal obstruction symptoms. As a result, nasal obstruction rather than a largely patent nasal airway may occur due to damaged mucosa or the lack of inferior turbinates. The anterior rhinoscopic examination can detect inferior turbinate hypertrophy. Diagnostic nasal endoscopy might confirm whole turbinate hypertrophy. [6] Over the years, several approaches have been outlined. Inferior turbinectomy, submucosal diathermy, steroid injection, inferior turbinate out fracture, cryosurgery, radiofrequency ablation, laser turbinoplasty, coblation turbinoplasty, and microdebrider aided turbinoplasty are some of the procedures available. [7] In this study, the surgical outcomes of endoscopic turbinectomy and microdebrider aided turbinoplasty are compared to one another.

## Material and Methods

This cross-sectional study was conducted in the Department of Otorhinolaryngology, Prathima Institute of Medical Sciences, Nagunoor, Karimnagar. Institutional Ethical committee permission was obtained for the study. Written consent was obtained from all the participants of the study after explaining the purpose of the study in the local language.

### *Inclusion criteria*

1. Aged between 18 – 40 years
2. Males and females
3. Diagnosed with inferior turbinate hypertrophy and nasal obstruction with or without allergic rhinitis
4. Patients willing to participate voluntarily

### *Exclusion criteria*

1. History of previous nasal surgeries
2. History of allergy to local anesthetics
3. Significant medical conditions detrimental to surgery

The patients were examined for symptoms of nasal obstruction and hypertrophied Inferior Turbinate with Thudicum's Nasal Speculum, Anterior Rhinoscopy is performed followed by nasal endoscopy. Investigations included DNE ECG, Chest X-ray, CT of paranasal sinuses were obtained to rule out osteomeatal complex involvement. Laboratory investigations done were CBP, ESR, Platelet counts, bleeding time, Clotting Time, Renal function tests, HIV, HBsAg. A standard operative procedure was used for conventional turbinectomy and Microdebrider assisted Inferior turbinoplasty. The postoperative follow was done every week

for the first 2 weeks and subsequently after one month, 2 months, and 3 months followed by 6 months the healing process and complications were assessed during each visit.

**Results**

A total of n=50 consecutive patients reporting to ENT, OPD with a diagnosis of inferior turbinate hypertrophy were included based on inclusion and exclusion criteria. They were divided randomly into two groups. Group I (n=25) cases undergoing conventional turbinectomy and group II (n=25) cases undergoing microdebrider assisted turbinoplasty. In group I out of n=25 cases n=15(60%) were males and n=10(40%) were females. Similarly in group II out of n=25 cases, n=12(48%) were males and n=13(52%) were females. In most of the cases, 64% in the study were belonging to the age group 21 – 30 years details depicted in table 1.

**Table 1: Distribution of patients according to their age groups**

| *Age group* | *Group I [Conventional Turbinectomy] N (%)* | *Group II [Microdebrider assisted Turbinoplasty] N (%)* | *Total (%)* |
|---|---|---|---|
| 18 – 20 | 02 (8) | 01 (4) | 03 (6) |
| 21 – 30 | 15 (60) | 17 (68) | 32 (64) |
| 31 - 40 | 08 (32) | 07 (32) | 15 (30) |
| Total | 25 (100) | 25 (100) | 50 (100) |

Anterior rhinoscopy & DNE evaluation of inferior turbinate size was done for all the cases included in the study and based on the degree of obstruction caused by the anterior aspect of inferior turbinate relative to the total airway space it was graded in 4 grades and number of cases and percentages has been given in table 2. A critical evaluation of table 2 revealed all the cases belonging to grade 3 and grade 4 obstructions no cases of grade 1 and grade 2 were found in the study.

**Table 2: showing the inferior turbinate size and degree of obstruction produced**

| Grades and percentage of obstruction produced on total airway space | *Group I [Conventional Turbinectomy] N (%)* | *Group II [Microdebrider assisted Turbinoplasty] N (%)* |
|---|---|---|
| Grade – 1 (0 – 25%) | 0 (0.00) | 0 (0.00) |
| Grade – 2 (26 – 50%) | 0 (0.00) | 0 (0.00) |
| Grade – 3 (51 – 75%) | 10 (40.00) | 13 (52.0) |
| Grade – 4 (76 – 100%) | 15 (60.00) | 12 (48.0) |

In the current study, a CT scan showed inferior turbinate hypertrophy in n=50 cases, and deviated nasal septum was found in n=25(50%) cases out of which n=15(30%) underwent conventional turbinectomy and n=10(20%) underwent microdebrider assisted turbinoplasty. Paranasal sinusitis was diagnosed in 16(32%) cases and concha Bullosa was found in n=6(12%) cases of the study.

**Table 3: Laterality of involvement of nasal obstruction in the cases of study**

| *Side involved* | *Group I [Conventional Turbinectomy]* | | *Group II [Microdebrider assisted Turbinoplasty]* | |
|---|---|---|---|---|
| | *Male* | *Female* | *Male* | *Female* |
| Left | 3 | 4 | 3 | 5 |
| Right | 8 | 3 | 4 | 4 |
| Bilateral | 4 | 3 | 5 | 4 |

Out of n=50 total cases of the study left side involvement was found in n=15(30%) cases and right-side involvement was found in n=19(38%) cases and bilateral involvement was found in n=16(32%) cases. The laterality of involvement of the cases group-wise and sex- wise is depicted in table 3. Out of n=50 cases in the study, the important complaints found were nasal obstruction in 100% of the cases, sneezing was the complaint in 76% of cases and rhinorrhoea was 64% of cases. The postoperative evaluation of the cases was done by Direct nasal endoscopy. No cases of inferior turbinate hypertrophy were detected. DNS was found in 50% of cases

**Table 4: Post-operative improvement in various parameters observed in the study**

| | *Group I [Conventional Turbinectomy]* | | | *Group II [Microdebrider assisted Turbinoplasty]* | | |
|---|---|---|---|---|---|---|
| Postoperative period | 1 month | 3 months | 6 months | 1 month | 3 months | 6 months |
| Nasal Obstruction | 1 | 0 | 0 | 1 | 1 | 1 |
| Synechiae | 4 | 0 | 0 | 0 | 0 | 0 |
| Crusting | 23 | 2 | 1 | 0 | 0 | 0 |

At one-month post-operative follow up nasal obstruction was found in n=1 cases of both groups. Improvement occurred at 3 months follow up in a group I case however no improvement was observed in the patient in group II at the end of 6 months. Synechiae formation occurred in n=4 cases of group I and improved at the 3 months follow up Crusting was observed in n=2 cases of group I and was found to improve in all cases except n=2 cases of group I the details has been depicted in table 4. The overall improvement in group I cases was 100% and in group II the improvement was in 96% of cases.

## Discussion

The main objective of surgery for a hypertrophied inferior nasal turbinate is to keep the nasal airway open for as long as possible while avoiding consequences such as severe nasal dryness, crusting, hemorrhage, and discomfort. [8] Each type of treatment has been studied and analyzed in terms of its benefits, drawbacks, consequences, and controversies. Over the years, more than ten surgical procedures have been employed to treat inferior turbinate hypertrophy, but there is a universally accepted procedure. The data on the effectiveness of these procedures is still inconclusive. For a reasonable number of patients, none of them has been able to achieve good long-term results in pathological turbinate hyperplasia. Furthermore, because there is a dearth of reliable information based on randomized controlled trials for inferior turbinate surgery outlining procedures with specified outcomes, evaluating the results is more challenging. [9] There are advantages of turbinectomies which include being technically simpler, rapid execution, less surgical time, and consequently lesser amount of anesthetic morbidity. The disadvantages are the formation of crust and the need for a review of hemostasis. The turbinoplasty is a tiresome procedure that requires more skill and increased surgical time however the advantages are no exposure of bloody area and less formation of bleeding and crusts. [10] Inferior turbinate size and degree of obstruction produced in this study were grade 3 and grade 4 (table 2) AN Kassab et al., [11] in their study in Egypt compared the management of inferior turbinate hypertrophy using turbinoplasty assisted by a microdebrider with a 980 mm diode laser. The results revealed no significant difference between the two procedures apart from isolated crustation in the patient operated by laser in a first post-operative week

which subsequently resolved in three weeks of follow up the results of the current study are similar to this study. Joniau S et al., [12] in their study compared the submucosal cauterization with powered reduction of inferior turbinates. They found powered turbinoplasty was superior to submucosal cauterization in all aspects of assessment which included postoperative crusting, endoscopic scoring of turbinate size, and acoustic rhinometry measurements of nasal cavity volume. However, a long-term follow-up showed that submucosal cauterization was associated with a recurrence of turbinate hypertrophy. Lorenz KJ et al., [13] studied microdebrider assisted inferior turbinoplasty with conventional partial inferior turbinectomy. The results revealed that turbinoplasty has the advantage of short healing time with minor postoperative complications and good functional outcomes.

## Conclusion

The current study concludes that both turbinectomy and turbinoplasty have almost similar success rates. However, turbinectomy removes a substantial portion of the inferior turbinate and gives symptomatic relief instantly in the postoperative period. The incidences of synechiae and crusting are considerably more in conventional turbinectomy. The current results sones did not indicate any superiority of turbinectomy over turbinoplasty and vice versa. The choosing of surgical techniques must be tailored to the needs of the respective case

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