

## Efficacy of Turbinoplasty in Allergic Rhinitis

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**Introduction:** Allergic rhinitis occurs in atopic individuals who are exposed to common aeroallergens. Allergic rhinitis is either seasonal or perennial. Inferior turbinate plays a important role in the normal physiology of the nose to regulate the nasal airflow as well as warming and humidification of the inspired air. Hypertrophy of inferior turbinate due to allergic rhinitis results in nasal obstruction. Various methods are available for surgical treatment of the hypertrophy inferior turbinate. Most of the turbinate resection results in destruction of the mucosa.

**Materials and Methods:** We present a series of forty-four patients with allergic rhinitis refractory to medical line of management and were treated with bilateral inferior turbinoplasty. Postoperatively patients were followed up at seven days, thirty days and ninety days. They were assessed for relief in symptoms and DNE on each follow up day.

**Results:** All the patient in our study showed improvement in symptoms of varying degrees.

**Conclusion:** Results suggest that inferior turbinoplasty is efficient in relieving the symptoms of allergic rhinitis such as nasal obstruction, sneezing, nasal discharge and nasal itching.

**Keywords:** Inferior Turbinoplasty; Surgeries for Allergic Rhinitis; Hypertrophied Inferior Turbinate

**Introduction**

Rhinitis is defined clinically by a combination of two or more nasal symptoms; running nose, nose blocking, sneezing and nasal itching. Of these alterations, inferior turbinate hypertrophy is the most common cause of nasal obstruction [1]. Allergic rhinitis occurs when these symptoms are the result of IgE mediated inflammation following expose to allergen. Every organ system of the human body is capable of an immunologic response and therefore, capable of developing allergic dysfunction and clinical disease the nasal chamber and surrounding nasal sinuses are by far the most

common shock organ of allergic disease. Although not so glamorous as its surgical counterparts, the management of allergic rhinitis constitutes a large portion of the day-to-day practice of otolaryngologist. In addition to its primary effect, inhaled allergy of the upper respiratory tract may affect the development and clinical course of other disease states such as sinusitis, otitis media and asthma. Allergic rhinitis occurs in atopic individuals who are exposed to common aeroallergens. Allergic rhinitis is either seasonal or perennial. Although frequently trivialized by patients and doctors. Allergic rhinitis remains a common cause of morbidity, social

embarrassment and impaired performance either at school or in the work place. Rhinitis affects well-being, both physical and psychological [2,3], with a direct relationship to allergen exposure [4]. Family dynamics can be disturbed. Uncontrolled AR reduces sleep quality impairing concentration, school attendance and performance. Rhinitis health-related quality of life is reduced, again in direct correlation with allergen exposure [5]. Management of allergic rhinitis includes allergen avoidance, pharmacotherapy, education and possibly immunotherapy. Surgery is rarely needed.

Therefore, symptomatic management, means of pharmacotherapy is required to some degree for every patient with allergic rhinitis. Numerous types of drugs are available for this purpose and each has unique characteristics. The physician must tailor the regimen according to the patient symptoms and circumstances. Even today despite the advances in the understanding of the numerous chemical mediators of allergy, only two major categories of drug are in common use for the management, namely antihistamines and corticosteroids. Sedating antihistamines further reduce learning ability and impinge on examination results [6]. Currently intranasal steroids represent the gold standard to which other treatment should be compared. Most cases of allergic rhinitis can be easily controlled both by life style changes and avoidance measures and appropriate medical therapy as per ARIA allergic rhinitis and its impact on Asthma guidelines. But surgery to reduce the surface area of the nasal mucosa and turbinate may be necessary in those patients in whom adequate control of symptoms is not achieved with medical therapy alone.

Puterman., *et al.* have performed turbinoplasties since 2002 with excellent results and minimal adverse effects. The procedure removed the lateral mucosa and bone of the inferior turbinate [7].

Brandarkar., *et al.* stated that the inferior turbinate surgery was effective and remains the best treatment for hypertrophy unresponsive to medical therapy [8].

Mori., *et al.* [9] studied in a sample of 45 patients, the efficacy of turbinectomy on rhinitis symptoms after five years, and concluded that the operation is a useful strategy to control allergic rhinitis symptoms and helps to improve the quality of life, with significant improvement in symptoms of nasal obstruction (70%) and sneezing (50%).

Mucci., *et al.* [10] in their sample of 55 patients, noted the improvement in nasal obstruction in 90% of patients after undergoing inferior turbinate surgery, as well as improvement in symptoms such as rhinorrhea and headache.

There are multiple studies conducted in regard to allergic rhinitis and associated symptoms, but very few studies have assessed the efficacy of turbinoplasty or turbinate surgeries on symptoms such as nasal discharge, sneezing and nasal itching. Hence the subject of clinical profile and surgical modalities in patient with allergic rhinitis was chosen.

### Aims and Objectives

To study the efficacy of turbinoplasty in allergic rhinitis, with respect to treatment of nasal obstruction, sneezing, nasal itching and nasal discharge in patients who do not have symptomatic improvement with medical line of treatment.

### Materials and Methods

The study was conducted on admitted patients in the Department of ENT, Vydehi Institute of Medical Sciences and Research Centre, Whitefield, Bangalore with allergic rhinitis who have been refractory to medical treatment of allergic rhinitis, nasal obstruction with hypertrophied inferior turbinates were chosen for the study. Anterior rhinoscopy and posterior rhinoscopy was done to assess the nasal disease and inferior turbinate hypertrophy. Selected patients were investigated by doing diagnostic nasal endoscopy to assess and document nasal disease, sinus disease, nasal passage and to grade inferior turbinate hypertrophy, computerized tomography scan of nose and paranasal sinuses was done to assess inferior turbinate hypertrophy, nasal septal deviation and sinus disease.

Grade inferior turbinate hypertrophy Friedman grading system of inferior turbinate hypertrophy [11]

- Grade I- The turbinate was defined as mild enlargement with no obvious obstruction.
- Grade II- The turbinate was in between grade I and grade III.
- Grade III- The turbinate completely occluded the nasal cavity.

After surgery all cases were followed up after 7 days, 30 days and 90 days, with the help of diagnostic nasal endoscopy and a patient questionnaire.

### Inclusion criteria

- Patients above 18 years of age.
- Inferior turbinate hypertrophy with allergic rhinitis who have been refractory to medical treatment of allergic rhinitis.

### Exclusion criteria

- Patients with previous history of nasal surgery.
- Patients who improved after clinical treatment for allergic rhinitis and vasomotor rhinitis.
- Patients with any significant anatomical alteration that generated nasal obstruction.

The selected patients who met the inclusion criteria are enumerated above were followed up post surgery after 7 days, 30 days and 90 days.

### Surgical procedure

General anesthesia was given. Submucosal infiltration was done along the entire length of inferior turbinate. Under endoscopic visualization Incision in the center of the inferior turbinate in its horizontal extension detachment of the entire mucosa above the incision, creating a mucosal flap, next the turbinate was incised in the anterior-posterior direction using turbinectomy scissors and then one of the scissors blades was directed to the mucosa detached from the bone in the upper part of the turbinate, while the other was directed to the inferior meatus, thereby removing most of the bone and all its lateral mucosa; the medial mucosa was removed only below the incision, as the mucosa above was used to cover the bony remnant. Nasal cavity was examined for adequate patency and bleeding. Anterior nasal pack done with merocel in antibiotic was placed in both nasal cavities for 48hrs.

### Post- operative treatment and follow up

Nasal pack removal was done 48 hrs after surgery. Each patient was put on a course of antibiotic for 5 days and analgesic like Diclofenac sodium and paracetamol & topical vasoconstrictor to prevent infection and to control bleeding. Normal saline as nasal drops was given to prevent crusting. Improvement in patient symptoms was assessed by nasal endoscopy and examination. Documentation of complications like bleeding, crusting and synechiae formation was done.

### Observation and results

We had 44 patients included in this study 22 male and 22 female patients (Figure 1).

The study included 2 of patients aged less than 20 years, 22 of patients between 21-30 years, 15 of the patients between 31-40 years and 5 between the age group of 41-50 (Figure 2).

The most common symptom which all 44 patients included in this study presented with was nasal obstruction, 36 of the patients presented with sneezing, 37 with nasal discharge, 37 presented with nasal itching (Figure 3).

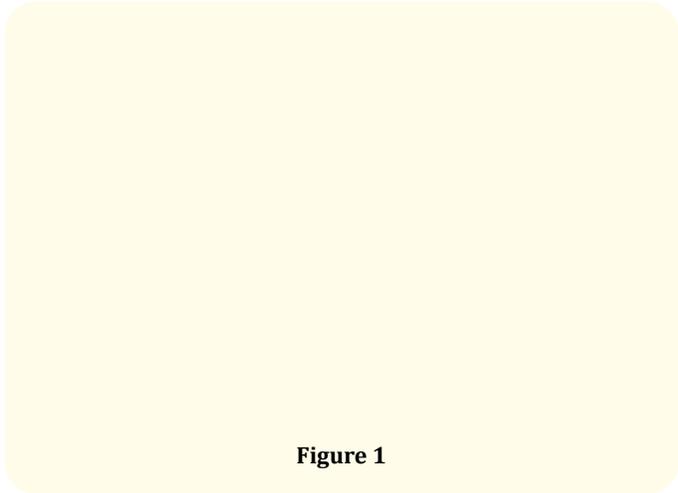


Figure 1

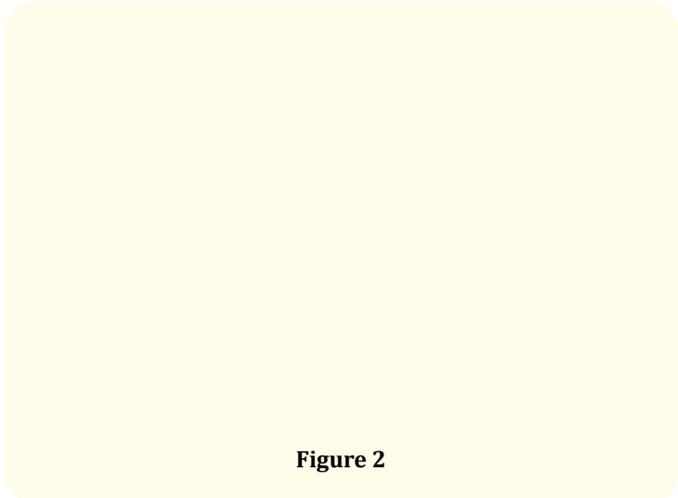


Figure 2

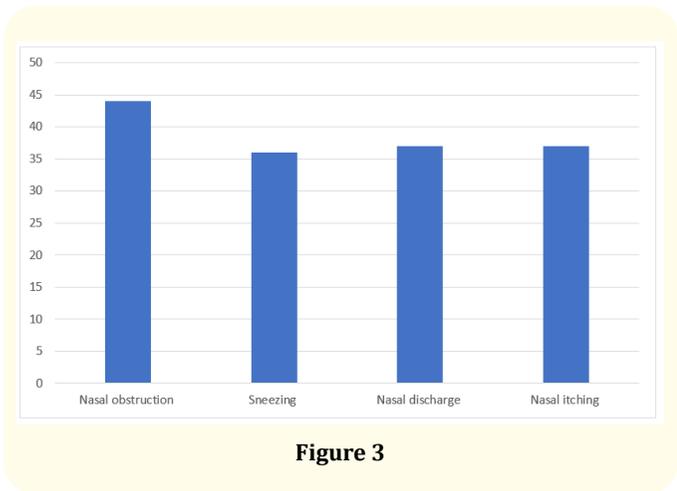


Figure 3

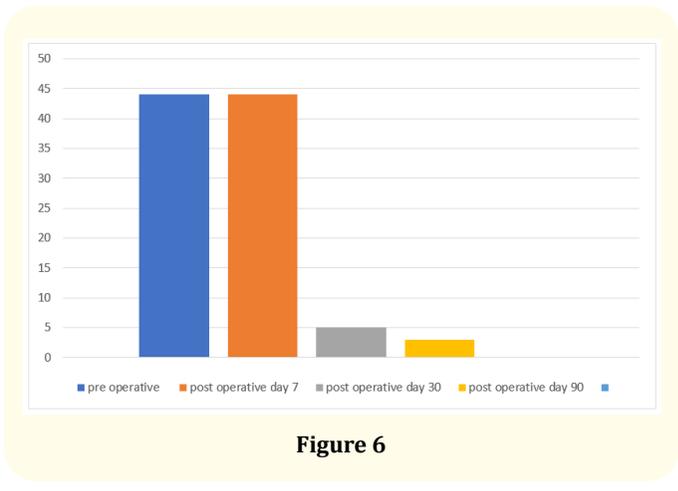


Figure 6

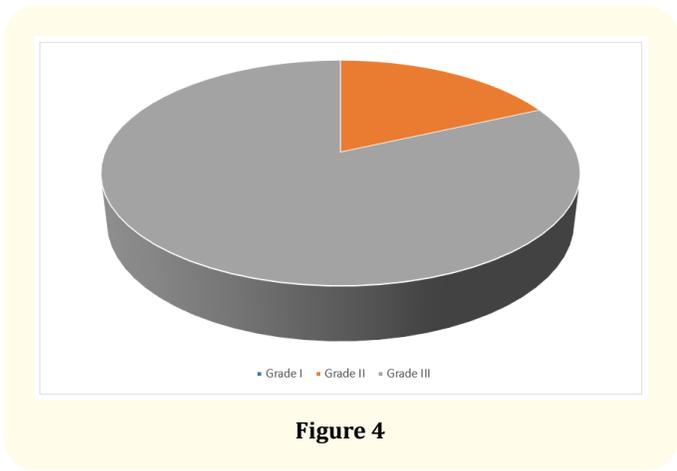


Figure 4

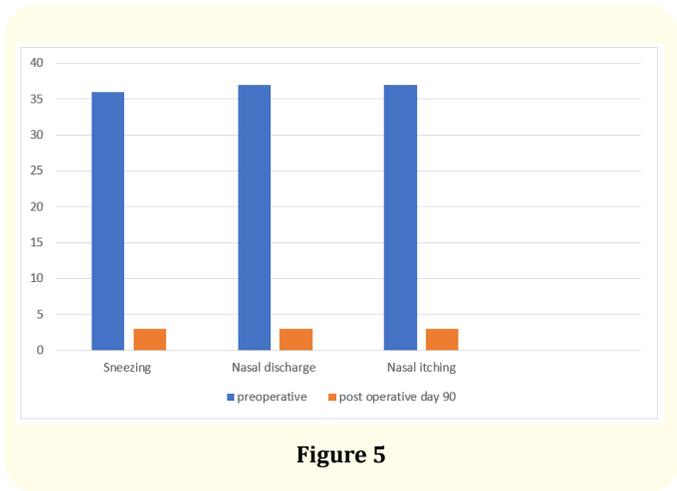


Figure 5

Grade of inferior turbinate hypertrophy on Diagnostic nasal endoscopy preoperatively was, 8 patients had grade II hypertrophy, while 36 patients had grade III hypertrophy of the inferior turbinate (Figure 4).

Comparison between the preoperative and post operative day 90, sneezing, nasal discharge and nasal itching showed the chi-square statistic showed the p-value is <0.001 in all the symptoms (Figure 5).

Among the 44 patient included in this study, 44 patients had nasal obstruction preoperatively. On post operative day 90, 3 patients had nasal obstruction and rest 41 had improvement in the nasal obstruction (Figure 6).

Among the 44 patient included in this study, 36 patients had grade III hypertrophy of inferior turbinate and 8 patients had grade II hypertrophy of inferior turbinate. On postoperative day 7, 44 patients had grade I hypertrophy of inferior turbinate. On postoperative day 30, 44 patients had grade I hypertrophy of inferior turbinate. On postoperative day 90, 44 patients had grade I hypertrophy of inferior turbinate.

**Discussion**

Allergic rhinitis is probably the most common chronic presenting symptom encountered by otorhinolaryngologists. Rhinitis is the inflammation of the nasal mucosal lining, characterized by the presence of one or more symptoms: nasal congestion, rhinorrhea, sneezing, itching, and hyposmia. Most cases are mild and respond

well to antihistamines and decongestant preparations or desensitization, but in some cases, surgery is required. Most widely used current procedures are lateral fracture, electrocautery, partial turbinectomy, turbinoplasty and resection with microdebrider.

Brandarkar, *et al.* [8] stated that the inferior turbinate surgery was effective and remains the best treatment for hypertrophy unresponsive to medical therapy.

Patients in this study had inferior turbinate hypertrophy, sneezing, nasal discharge and itching in the nose as the finding. None of the cases had concomitant septal deviation or another finding, which made it possible for this study to evaluate the impact of procedure on the inferior turbinate.

Giampiero, *et al.* [12] in a study on 18 patients who underwent Microdebrider inferior turbinoplasty, after 4 months the nasal mucosa showed normal appearance, with restoration of the pseudostratified ciliated pattern, intercellular connections and normal cellular morphology. Fibrosis and submucosal edema disappeared. At longer time after operation (4 years) clinical improvement was confirmed. Friedmann, *et al.* [11] in his study observed that 72% had grade I and 28% had grade II inferior turbinate size after surgery. The grading of turbinate size was similar but our results are better which may be due to repeated nasal endoscopic examinations and precise tissue resection at surgery.

In our study we observed on post operative day 7 patients had no improvement in the nasal obstruction 100% (n = 44), This is consistent with the evolution in the first weeks post operatively, when edema and crusts may obstruct breathing. On postoperative day 30 88% (n = 39) observed improvement in nasal obstruction. And on post operative day 90, 93% (n = 41) observed improvement in nasal obstruction.

The benefits of surgery on the inferior turbinate are not limited to improvement in nasal obstruction and encompass other allergic rhinitis symptoms, mainly in relation to sneezing as well. The main objective of inferior turbinate surgery is to allow better circulation of air through the nasal passages. However, as turbinoplasty involves partial turbinate resection, and thus necessarily reduces nasal mucosa surface exposed to the action of allergens and other stimuli, as well as reducing the amount of glandular tissue in this region, this might explain the improvement in other rhinitis symptoms observed in study [13].

Rodrigo, *et al.* [13] demonstrated findings, as more than 89.7% of patients who usually had itching, sneezing, and rhinorrhea achieved moderate or complete recovery three months after the surgery.

Dov, *et al.* [14] in his study following bilateral inferior turbinectomy, 80% of the patients reported reduced nasal obstruction and 27% reported reduced nasal discharge.

In our study on post operative day 90, 93% (n = 41) of the patients observed improvement in sneezing. 93% (n = 41) of the patients appreciated reduced nasal discharge on post operative day 90. Nasal itching was noticed to be reduced in 93% (n = 41) patients on day 90 post operative day.

These results demonstrate that the benefits gained from inferior turbinoplasty are not limited to nasal obstruction, and patients also can expect improvement in other rhinitis symptom.

## Conclusion

Inferior turbinate hypertrophy due to allergic rhinitis, in patients who did not benefit with medical line of treatment were treated with inferior turbinoplasty in our study to assess the success and efficacy. Bilateral Inferior turbinoplasty was successful in relieving the symptoms of allergic rhinitis such as nasal obstruction, sneezing, nasal discharge and nasal itching. Bilateral Inferior turbinoplasty is a good method for surgical treatment of hypertrophied inferior turbinate with good postoperative results in allergic rhinitis patients.

## Limitations

Anosmia is also one of the problems faced by people suffering with allergic rhinitis along the other symptoms we discussed. We could not add this feature into this study.

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