



**Research Article**

**EFFICACY OF PARTIAL INFERIOR TURBINECTOMY IN PATIENTS WITH ALLERGIC RHINITIS: A CASE SERIES**

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**ABSTRACT**

**Background:** Nasal obstruction due to inferior turbinate hypertrophy is a common complaint of allergic rhinitis (AR) which affects significantly the patient's quality of life. Surgical reduction of inferior turbinate is recommended for patients with AR refractory to medical therapy. The objective of this study was to evaluate the efficacy of partial inferior turbinectomy for obstructive and non-obstructive symptoms in patients with persistent allergic rhinitis that is not responsive to usual treatments.

**Material and Method:** Prospective study with 45 patients with allergic rhinitis who underwent partial inferior turbinectomy. They were assessed for nasal obstruction and other rhinologic functional signs by subjective (questionnaires) and objective methods (endoscopic examination) before and after six months of the surgery. Comparison between severity of symptoms before and after surgery allowed us to evaluate the degree of improvement of each symptom. We categorized the results as null, fair, good and excellent, after subtracting the postoperative score from the preoperative score.

**Results:** the surgical procedure was effective in reducing nasal obstruction & other symptoms of AR. For nasal obstruction, the surgery showed good or excellent improvement in 84,4% of the cases. 77,7 % presented good or excellent improvement in sneezing. Rhinorrhea presented good or great results in 53,3% of the patients and, nasal itching, 46,6%.

**Conclusion:** The study demonstrated the interest of partial inferior in controlling obstructive and non-obstructive symptoms in patients with allergic rhinitis refractory to medical treatment.

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**INTRODUCTION**

Chronic nasal obstruction is a common medical complaint and a very frequent symptom in otorhinolaryngology. One of the major causes of chronic nasal obstruction is mucosal hypertrophy of the inferior turbinate [1]. Allergic rhinitis and other forms of rhinitis figure as the main causes of inferior turbinate hypertrophy (TIH) [1,2].

Allergic rhinitis is an inflammatory disease characterized by the symptoms such as recurrent paroxysmal multiple bouts of watery rhinorrhea, nasal obstruction sneezing, and itching sensations of the (nose, eyes, ears, palate) [3]. Diagnosis is essentially clinical, taking into account the association of the several symptoms and may be complemented by skin prick tests or serum levels of allergen-specific IgE [3,4]. Allergen avoidance, pharmacotherapy, and immunotherapy are recommended in first intention. However, when these treatments fail to improve the patient's symptoms,

surgical turbinate reduction is indicated to control the obstructive component and to improve the quality of life [4,5].

Different surgical procedures that aim to reduce the size of the inferior turbinate, include: turbinectomy, turbinoplasty, electrocautery, radiofrequency ablation, laser vaporization and cryosurgery [5,6]. Whatever the surgical technique may be, all are destructive, to varying extents, to the respiratory epithelium on the turbinate surface and have both advantages and disadvantages [7]. The ideal surgery of the inferior turbinate should accomplish a reduction of the turbinate volume while maintaining the physiological functions of the mucosa with minimal postoperative complications [5,7]. Partial inferior turbinectomy (PIT) is one of the most frequently surgical procedure adopted for nasal de-obstruction of patients with allergic rhinitis non-responsive to clinical treatment [7]. In this prospective study the aim was to evaluate the functional efficacy of partial inferior turbinectomy in patients with obstructive allergic rhinitis refractory to medical management.

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## MATERIALS AND METHODS

### Patients

This prospective clinical study was conducted in Department of Otorhinolaryngology-Head and Neck Surgery, Moulay Ismail Military Hospital, Meknes, on 45 allergic rhinitis patients with hypertrophied inferior turbinates. All patients submitted to nasal surgery of partial turbinectomy in the period of September 2016 to December 2018.

### The inclusion criteria were

- age between 21 and 56 years;
- hypertrophy of inferior turbinate due to the allergic rhinitis lasting more than 4 months per year;
- failure of medical treatments.

### Exclusion criteria were

We excluded from the study any patient with the following exclusion criteria:

- Age below 21 years;
- history of nose surgery;
- obstructive septal deviation;
- evolutive rhinosinal infection;
- nasal polyposis and/or nasal tumors;
- Contraindications for surgery.

### Preoperative assessment

Following a comprehensive description of the project, patients signed consent form. Preoperative assessment comprised questionnaires (subjective evaluation) and endoscopic examination (Objective evaluation).

### Subjective assessment

The questionnaire included the degree of nasal obstruction, rhinorrhea, sneezing and nasal itching. These subjective symptoms were assessed using a standardized grading system of 0 to 3 (null: grade 0, mild: grade 1, moderate: grade 2 and severe: grade 3).

### Objective assessment

Endoscopic examination used 30°4-mm-diameter rigid endoscope (Atmos, Germany) following xylocaine naphazoline vasoconstriction to eliminate any associated obstacle.

Inferior turbinate was graded into I II, III on the basis of size of the inferior turbinates.

- No odema: normal inferior turbinate.
- Grade I: Inferior turbinate is 25% of nasal cavity.
- Grade II: Inferior turbinate is 50% of nasal cavity
- Grade III: Inferior turbinate is 75% or more of nasal cavity

### Surgical Procedure

Surgical procedure was performed under general anesthesia and under the guidance of a 30 ° 4-mm-diameter rigid endoscope (Atmos, Germany).

The inferior turbinate was infiltrated with lidocaine 2% and 1:100 000 adrenaline, up to the posterior end, blanching the turbinal mucosa. The inferior turbinates were fractured medially then mucosa was crushed at its attachment to lateral

nasal wall using an intestinal clamp forceps. Using the turbinectomy scissors, the bulk of the anterior and midportion of the inferior turbinate was removed medial to the crush portion. Posterior end of the inferior turbinate was removed with a special scissor which crushes and then cuts the tissue [8,9]. Silastic sheets were placed and sutured on each side of the nasal septum. The nasal cavities were then packed with Merocel, which were removed 24 hours later.

### Post-operative care

- Thrice-daily fossa lavage with 0.9% saline solution was starting in the next day of operation and continued for one month post-operatively.
- Prophylactic antibiotic and paracetamol in case of pain were given for 5 days.
- Silastic sheets were removed at the 1st week post-operatively.
- All patients were seen again seven days after surgery to check for local complications and remove the clots and crusts.

### Post-operative assessment

All patients were seen postoperatively at 6 months, for subjective evaluation using the same protocol as for initial assessment to update information on severity of symptoms and objective evaluation by endoscopic examination.

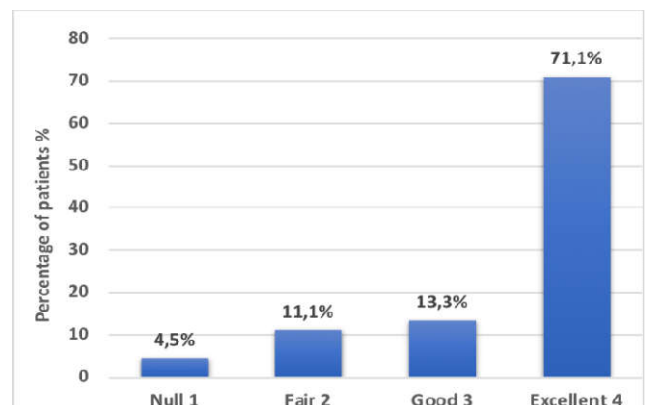
Comparison between intensity of symptoms observed before and after surgery allowed us to determine degree of improvement or worsening of the clinical state. We subtracted postoperative score from the preoperative score concerning symptoms severity, and categorized the results as 0 = null; 1 = fair; 2 = good; and 3 = excellent.

Post-operatively size of the inferior turbinate was also compared with the preoperative size of the inferior turbinate according to endoscopic grading system. The presence of bleeding, crusting, synechia and turbinate necrosis/atrophy was documented during visit.

## RESULTS

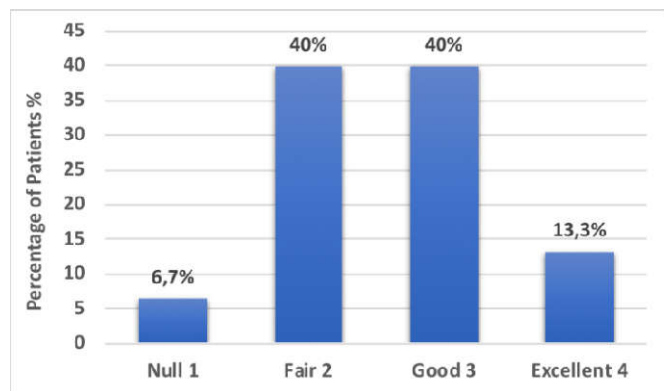
The study population comprised 45 patients. There were 24 male (53,33%) and 21 female (46,66%) patients ranging in age between 21 and 56 years, with a mean age of 29,3 years.

As it shown in Graphs, all symptoms presented clinical improvement. Regarding nasal obstruction, of the 45 patients, most showed moderate or complete improvement, as shown in graph1.



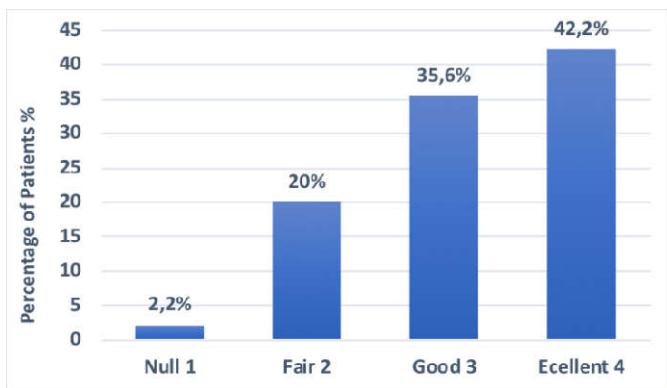
Graph 1 Response to nasal obstruction after 6 months of surgery

Relative to rhinorrhea, 6 patients (13.3%) showed excellent improvement, 18 (40 %) good, 18 (40%) fair and 3 (6,7%) null, as can be observed in Graph 2.



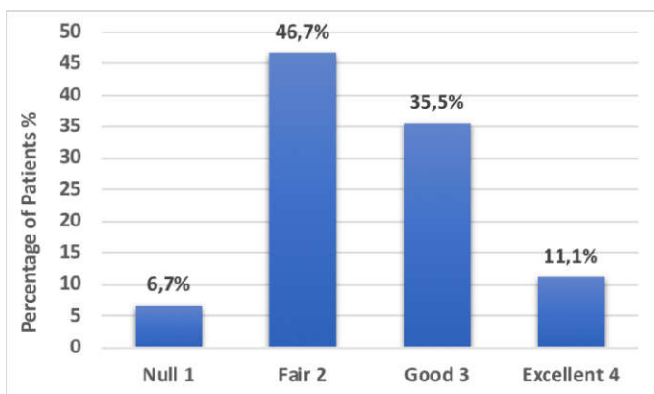
Graph 2 Response to rhinorrhea after 6 months of surgery

Concerning sneezing 19 patients (42.2 %) had excellent improvement of this symptom, 16 (35,5%) had good and 9 (20 %) had fair and 1 (2.2%) had not noticed any changes (Graph 3).



Graph 3 Response to sneezing after 6 months of surgery

Finally, results concerning nasal itching were excellent only in 5 (11.1%) patients, good in 16 (35,5%), fair in 21 (46,7%) and null in 3 (6,7%) (Graph 4).



Graph 4. Response to nasal itching after 6 months of surgery

Regarding the grading of the size of the inferior turbinate, before the surgery, 16 patients (35,55 %) with Grade 2 and 29 patients (64,44 %) with Grade 3 were observed. 6 months after the surgery, all 45 patients had grade 1 (Table1).

Table 1 Pre and post-operative grading of ITH of the studied group (N=45).

Follow-up	Grade I	Grade II	Grade III
Pre-operative	0	16	29
Post-operative	45	0	0

## DISCUSSION

Allergic rhinitis (AR) is among the most common reasons for visits to otolaryngologists and occurs in up to 25% of the population [3]. It is characterized predominantly by nasal congestion, clear rhinorrhea, pruritus, and paroxysmal repetitive sneezing. The diagnosis is based on the correlation between the clinical history, physical findings and diagnostic tests for allergy based on skin reactions or serum allergen-specific IgE antibody measurements [3,4].

Oral or topical antihistamines, intranasal corticosteroids or, if possible immunotherapy combined with allergen avoidance are the mainstays of treatment for allergic rhinitis, with variable symptom control. However, most authors agree that when these treatments are not systematically effective, surgical turbinate reduction should be indicated. It aims to allow better circulation of air through the nasal passages by reducing the size of the inferior turbinate but preserving the physiological function of the turbinate such as humidification & temperature regulation of inspired air [4-7].

Since the 1890s, various techniques for surgical management of hypertrophied inferior turbinates have been described: total or partial turbinectomy, submucosal resection, cryosurgery, electrocautery, turbinoplasty, microdebrider-assisted turbinoplasty, laser-assisted turbinoplasty, volumetric tissue reduction by radiofrequency, treatment with infrared light, argon plasma surgery and topical application of AgNO<sub>3</sub> [5,10]. Among these surgical options, we opted for partial inferior turbinectomy. It is reported to be easier technique and seems to provide an optimal combination of turbinate volume, and hence obstruction, reduction and conserved nasal function [11].

According to the literature review, several reports have demonstrated the long-term efficacy of turbinectomy in patients with allergic rhinitis refractory to clinical treatment. Mucci *et al.* in their sample of 55 patients, mentioned the improvement in nasal obstruction in 90% of patients submitted to inferior turbinate surgery, as well as improvement in other symptoms of allergic rhinitis [12]. Mori *et al.* followed 45 patients with allergic rhinitis who were submitted to turbinectomy during 5 years after surgery. They concluded that the operation is a useful strategy to control allergic rhinitis symptoms with significant improvement in symptoms of nasal obstruction (73,3%) and sneezing (68,9%) [13]. The present study showed similar findings, as more than 80 % of patients who had nasal obstruction, sneezing, rhinorrhea and nasal itching achieved moderator or complete recovery six months after the inferior turbinate surgery. The symptoms that responded better to surgery were nasal obstruction and sneezing, with 86 % and 74 % of good and excellent results, respectively.

Concerning size of inferior turbinate, we noted significant improvement in turbinate grade postoperatively compared with its preoperative values (Table 1). We did not report major complications, atrophic changes or purulent infections of the

nasal mucosa during or after the surgery. Although the results obtained by Imad *et al* in a study conducted in 50 patients found that submucosal diathermy to be safe and better procedure in respect of bleeding, pain, crusting and healing than partial inferior turbinectomy [14].

These results demonstrate significant improvement not only in nasal obstruction, but also in other allergic rhinitis symptoms, although limited to rhinorrhea and nose itching. This might be explained by the fact that partial turbinectomy involves reduction of the surface of the nasal mucosa exposed to the action of allergens and other stimuli, as well as reducing the amount of glandular tissue in this region [15].

## CONCLUSION

This study demonstrated that partial turbinectomy is not only effective in reducing the nasal obstruction in allergic rhinitis refractory to medical treatment but also other symptoms of allergic rhinitis, particularly rhinorrhea, sneezing and itching. However, longer follow up is required to assess recurrence of symptoms after surgery.

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