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## Management of inferior turbinate hypertrophy: a comparative study between Partial Turbectomy and Submucous Diathermy

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### Abstract : -

**Objectives :** -Comparison between submucous diathermy ( SMD ) & partial turbectomy in patients with inferior turbinate hypertrophy & nasal obstruction showing the advantages & disadvantages of each procedure in order to find a clear way for the otolaryngologists to manage inferior turbinate hypertrophy .

**Patients & Methods:** Fourty patients are enrolled in this study with bilateral inferior turbinate hypertrophy & nasal obstruction . They were subjected to detailed study of medical history & clinical examination. All patients underwent SMD in the left side & partial turbectomy in the right side with postoperative follow up frequently up to one year duration by subjective & objective assessments.

**Results:** Subjective improvement of nasal air flow is seen in 82.5% of SMD & 97.5% of partial turbectomy. Snoring persists in 10% of patients with SMD & only 2.5% in turbectomy . Postoperative reactionary hemorrhage is nil in SMD , while it is 12.5% in turbectomy . Unilateral facial pain persists for longer duration with higher incidence ( 12.5% ) in turbectomy . Nasal crusts & wound infection seen only in turbectomy ( 5 % ). No remote sequelae reported precisely atrophic rhinitis & nasal adhesions .

**Conclusions:** Various surgical methods have been tried for enlarged inferior turbinate , the most well known techniques are SMD & turbectomy . SMD is relatively safer & less invasive technique but turbectomy is more effective one , both procedures have advantages , disadvantages & their own complications , hence the choice of surgery can be individualized according to many factors

**Keywords:** turbinate, Partial turbectomy, Submucous Diathermy.

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### Introduction : -

**D**isturbances of nasal air flow occurs in about 30% of the population causing nasal obstruction <sup>[1]</sup> . One of the major causes of chronic nasal obstruction is diseases of inferior turbinate commonly inferior turbinate hypertrophy <sup>[1]</sup>, which sometimes donot respond to medical treatment & need surgery . Different surgical methods have been achieved for inferior turbinate hypertrophy e. g. linear cautery , laser cautery , silver nitrate cautery , SMD & inferior turbinate trimming . However ; there is no agreement on how to deal with this problem .

In Iraq the most widely useful surgical procedures to reduce the size of the inferior turbinate are SMD & turbectomy . The principle of surgical diminishing of the inferior turbinate size should be to decrease the patient's complaint while preserving the function & anatomy of the nasal air passages . This study is conducted to evaluate & analyze the impact of either procedures on nasal obstruction .

### Patients & Methods : -

This prospective study enrolled 40 patients who attended department of otolaryngology in Al-Yarmouk Teaching Hospital, the age range is between 29– 44 years . All patients involved in this study were complaining of nasal obstruction due to bilateral inferior turbinate hypertrophy provided that no other cause of nasal obstruction ( no nasal polyposis, almost straight nasal septum , acceptable size middle turbinate , no concha bullosa , patent postnasal space ) .

The study is established over a period of 2 years ( from March 2007 to January 2009 ) where 40 patients with bilateral inferior turbinate hypertrophy were examined clinically ( with anterior rhinoscopy ) , endoscopically with nasopharyngoscopy & radiologically ( with plain sinus X ray & CT scan ) . Full preoperative investigations done .

### We classified inferior turbinate hypertrophy into three grades : -

**Grade 1:-** normal size inferior turbinate , not atrophic , without nasal obstruction .

**Grade 2:-** moderate size inferior turbinate, not touching the septum , with nasal obstruction that respond to local decongestant .

**Grade 3:-** Large mulberry turbinate , touching the septum ,with nasal obstruction that not respond to local decongestant .

The operation is done in all cases of grade 3 & some cases of grade 2 with nasal obstruction that not responding permanently to medical treatment. The patients subjected to comparative surgery (right side with partial inferior turbinate resection & left side with SMD) . In the operation classical SMD is done on the left side with diathermy power 50 joules that applied in three points in a triangular manner (superior, medial & inferior). It is applied to reduce the bulk of the inferior turbinate <sup>[2]</sup> .

Classical partial inferior turbectomy is done on the right side using turbectomy scissor where the medial 1/3<sup>rd</sup> of the anterior end of the inferior turbinate ( mucosa & sinusoidal tissue ) is resected without any trauma to the bony inferior concha . If the posterior end is hypertrophied then resection of the posterior end is also done <sup>[3]</sup> .

Silastic sheets applied in both sides to prevent occurrence of adhesions & to make removal of pack less irritant. Light pack was applied in the left side (diathermy) & more hard one in the right side (turbinectomy). The pack is removed in the 1<sup>st</sup> postoperative day in the left side, while it is removed in the 2<sup>nd</sup> postoperative day in the right side. The silastic sheets are removed in the 10<sup>th</sup> postoperative day. Antibiotics are given for 10 – 14 days with systemic decongestant & topical medication (local vasoconstrictor or topical steroid accordingly). If the patient have allergic rhinitis then short course of oral steroid is given for 5 days. Postoperative nasal douch with sodium bicarbonate is continued for one week in SMD & 10 – 14 days in turbinectomy.

**Postoperative follow up is done as follows :-**

**Day 1 :** to remove the pack in the left side & look for bleeding.

**Day 2 :** to remove the pack in the right side & look for bleeding.

**Day 10:** to remove silastic sheets & look for infection & headache.

3weeks postoperatively: to look for nasal obstruction & infection.

3 Months & one year postoperatively : to look for nasal obstruction , nasal adhesions , & atrophic rhinitis .

**Results :-**

This is a prospective study that includes 40 patients, all with nasal obstruction due to bilateral inferior turbinate hypertrophy. Vasomotor rhinitis constitutes

21 patients , while 16 patients showed allergic rhinitis & 3 patients with persistent inferior turbinate hypertrophy at least 2 – 3 months after correction of nasal septal deviation with some sort of intrinsic rhinitis .

Preoperative assessment & postoperative results can be summarized in table (1) & table (2) .

Postoperative complications ( Table 3 ) :-

- 1 – Reactionary hemorrhage was not encountered in SMD , while it was seen in 5 cases ( 12.5% ) with turbinectomy ; 4 of these (10%) the bleeding was mild & stop spontaneously within one hour & only one patient ( 2.5% ) had moderate bleeding & required repacking for another 4 hours .
- 2 – Unilateral facial pain & headache ( at the side of the operation) & postoperative irritation disappeared within the 1<sup>st</sup> 24 hours in SMD & persists as mild pain for 72 hours after surgery only in 2 patients ( 5% ) , but it was continued for 3 – 4 days postoperatively in turbinectomy & persists for about 7 – 10 days in 5 patients (12.5%) .
- 3 – Nasal crusts & turbinectomy wound infection seen in 2 cases ( 5% ) of partial turbinectomy & actually needed proper nasal douch with systemic antibiotic .
- 4 – Vestibular skin burn seen only in one case (2.5% ) with SMD & was simple.
- 5 – Remote complications especially atrophic rhinitis & nasal adhesions are not reported in both procedures in this study .

**Table 1: Preoperative assessment in the left side (with SMD) and right side with partial turbinectomy**

| Preoperative Assessment                         | Left side No. | Right side No. |
|-------------------------------------------------|---------------|----------------|
| <b>Subjective findings :-</b>                   |               |                |
| Feeling of nasal obstruction                    | 40            | 40             |
| Snoring                                         | 40            | 40             |
| <b>Objective findings :-</b>                    |               |                |
| Spatula test ( negative )                       |               |                |
| Nasal examination (large size turbinate )       | 38            | 40             |
| Radiological examination( large size turbinate) | 40            | 40             |
|                                                 | 40            | 40             |

**Table ( 2 ) : showing the Postoperative findings of each procedure .**

|                                                                | No. & % of Patients | No. & % of Patients |
|----------------------------------------------------------------|---------------------|---------------------|
| Postoperative findings                                         | Left side           | Right side          |
| <b>Subjective findings</b>                                     |                     |                     |
| Improvement of nasal obstruction                               | 33 (82.5%)          | 39 (97.5%)          |
| Disappearance of snoring                                       | 36 ( 90% )          | 39 (97.5%)          |
| <b>Objective findings :-</b>                                   |                     |                     |
| Spatula test ( positive )                                      | 35 (87.5%)          | 40 ( 100% )         |
| Nasal examination (small size turbinate)                       | 34 ( 85% )          | 39 (97.5%)          |
| Radiological examination showing small size inferior turbinate | 35 (87.5%)          | 39 (97.5%)          |

Table ( 3 ) : showing the postoperative complications of each procedure .

| Postoperative Complications                 | Left side  | Right side  |
|---------------------------------------------|------------|-------------|
| Reactionary hemorrhage                      | Nil        | 5 ( 12.5% ) |
| Nasal Crusts & Turbinectomy wound infection | Nil        | 2 ( 5 % )   |
| Vestibular skin burn                        | 1 ( 2.5% ) | Nil         |
| Unilateral headache & Nasal pain            | 2 ( 5 % )  | 5 ( 12.5% ) |
| Nasal adhesions                             | Nil        | Nil         |
| Atrophic rhinitis                           | Nil        | Nil         |

**Discussions : -**

Nasal obstruction is one of the commonest chronic symptoms encountered in otolaryngology. In most patients the cause is either septal deviation or inferior turbinate hypertrophy due to vasomotor rhinitis or allergic rhinitis. Inferior turbinate hypertrophy almost always is due to swelling of the submucosa caused by dilatation of the venous sinusoids. Significant cases are usually mild & respond to antihistamines or local decongestant, however; occasionally turbinate hypertrophy is due to submucous fibrosis rendering the turbinate incapable of decongestion & hence need surgery<sup>[4]</sup>. Surgical treatment is controversial, & variety of surgical procedures are performed for managing inferior turbinate hypertrophy, but there is no completely effective therapy.

Partial inferior turbinate resection is preferred by many surgeons as there is low morbidity & the amount of turbinate excised can be altered according to the degree of symptomatology. Our object is to discuss the results of SMD in comparison with the results of partial turbinectomy

, & to achieve that goal we depended on subjective & objective assessments of the same patient in order to have more accurate interpretation. Rhinomanometry was not used because it is not available in our center.

Regarding subjective results (feeling of nasal obstruction & snoring) turbinectomy results are more helpful than SMD, that is also seen in objective results (spatula test, radiological examination & nasopharyngoscopy). Subjective feeling of nasal obstruction is persisted in 7 patients (17.5%) with SMD, 4 of them (10%) complained also of snoring, this may reflect inefficacy of SMD with poor response in comparison with partial turbinectomy. Proper benefit with patent nasal airflow in SMD is achieved after 2 months, while dramatic response is obtained within 2 weeks postoperatively in turbinectomy. We compared our results regarding improvement of nasal airflow with many studies over the world as shown in table (4) & table (5), & it seems that our results are variable from better to less benefit in comparison with these studies.

Table ( 4 ) : Improvement of nasal airflow with submucous diathermy in different studies .

| Study                              | Results |
|------------------------------------|---------|
| Luczaj 2007 ( Poland ) ( 1 )       | 98 %    |
| Fradis et al 2000 ( USA ) ( 5 )    | 76 %    |
| Warwick – Brown 1987 ( UK ) ( 11 ) | 60 %    |
| Our study                          | 82.5 %  |

Table ( 5 ) : Improvement of nasal airflow with turbinectomy in different studies .

| Study                                   | Results |
|-----------------------------------------|---------|
| Barbosa Ade et al 2005 ( Brazil ) ( 6 ) | 98 %    |
| Fradis et al 2000 ( USA ) ( 5 )         | 96 %    |
| Rakover & Rosen 1996 ( USA ) ( 7 )      | 77 %    |
| Serrano 1996 ( France ) ( 8 )           | 81.7 %  |
| Elwany & Harrison 1990 ( Egypt ) ( 9 )  | 77 %    |
| Pollock & Rohrich 1984 ( USA ) ( 10 )   | 90 %    |
| Our study                               | 97.5 %  |

Reactionary hemorrhage is negligible in SMD, while it constitutes 12.5% of patients with turbinectomy (in Fradis et al 2000 it was 4% & 20% respectively ) (5). Postoperative infection of turbinectomy wound & nasal crusts are seen in 2 cases (5%) of turbinectomy only, this can be preventable by good nasal cleaning with insisting the patients to do proper nasal douch .

These beneficial results of turbinectomy rather than SMD can be explained by the fact that turbinectomy is more destructive surgery involving resection of part of inferior turbinate (mass resection), while SMD showed less decrement in the size of inferior turbinate because it depends on fibrosis of the soft tissues of inferior turbinate that cannot be expected how much. This is a draw back against SMD as we cannot decide which point in the pathway of diathermy will be cauterized .

On the other hand, postoperative complications of SMD were much lower & actually minimal in contrast with turbinectomy. Although postoperative complications of turbinectomy are preventable, treatable & not much influence the outcome of surgery but it is so considerable for patients & surgeons & take a great part in the decision about which operation to do .

Nasal adhesions were not encountered because silastic sheets were applied with proper nasal douch . Atrophic rhinitis was not reported one year postoperatively because we did partial resection of the inferior turbinate.

#### Conclusion : -

We emphasized that the extent of postoperative improvement doesnot depend on preoperative assessment & therefore improvement is unpredictable.

Both procedures are relatively safe , effective & donot need expensive instrumentation that may not be available in many medical centers . It is so clear from these results that SMD is easier , safer , & less invasive technique than partial turbinectomy , but the great benefit of surgery is obtained from turbinectomy .

Therefore , we can conclude that the surgeon can decide the choice of the operation accordingly (depending on the cause of inferior turbinate hypertrophy, grade of turbinate hypertrophy, patient

general condition , patient acceptance , surgeon preference , . . . . etc. ) .

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