ORIGINAL ARTICLE

Comparison of the Surface Cautery and Submucuos Diathermy in Relation to Relief of Nasal Obstruction Caused By Hypertrophied Inferior Turbinates

IMRAN SAEED, MUHAMMAD AKHLAQ*, ABDUR REHMAN**

ABSTRACT

Background: Nasal obstruction is one of the most common chronic presenting symptoms encountered by otolaryngologists. In most patients, the cause of nasal obstruction is either nasal septal deviation or turbinate hypertrophy owing to vasomotor or perennial allergic rhinitis.
Aim: To compare the surface cautery and submucuos diathermy in relation to relief of nasal obstruction caused by hypertrophied inferior turbinates.
Methods: For treatment of nasal obstruction due to bilateral congestion of the inferior turbinates by applying two techniques. Sixty patients with bilateral nasal obstruction were divided into 2 groups. Thirty patients underwent surface cautery, and 30 patients underwent SMD.
Setting: Department of ENT; Sir Ganga Ram Hospital, Lahore.
Duration of study: One year (01-01-2012 to 31-12-2012).
Results: Patency of nose was checked in all 30 patients of group A, fully blocked in 1st to 2nd weeks. Sixteen patients were fully blocked and 14 patients were partially blocked in 3rd week. In 4th week, all 30 patients were partially blocked. In group B, all 30 patients were fully blocked in 1st week. There was no difference statistically between two groups in the first week ($p>0.05$). In 2nd week, 18 patients were fully blocked and 12 patients were partially blocked. In 3rd week, all 30 patients were partially blocked. In 4th week, 19 patients were partially blocked and 11 patients were fully patent. In second, third and fourth follow-up weeks, there was statistically significant difference ($p<0.001$).
Conclusion: SMD is procedure with less failure rate and less discomfort postoperatively. For symptomatic inferior turbinate hypertrophy, where topical nasal decongestant has little role, SMD is the treatment of choice for longer relief.
Kew words: Surface cautery, Sub-mucosal diathermy and Hypertrophied inferior turbinate.

INTRODUCTION

Inferior turbinates are vitally important in adjusting the airflow through nasal fossae according to body needs.[1] The changes in their size are reflexly controlled through autonomic nervous system[1]. Persistent enlargement of inferior turbinates is usually due to allergic rhinitis, vasomotor rhinitis and rhinitis medicamentosa etc[2]. The role of inferior turbinate hypertrophy in the reduction of nasal airflow is well established[3].

Hypertrophy of the inferior turbinates is a major cause of nasal obstruction[4]. Although chronic nasal obstruction is not life threatening, it impairs patients, quality of life in a significant way, affecting many aspects of their daily social and working activities[3].

Hypertrophy of the inferior turbinates can be treated by surgical reduction that seems to be the most effective approach[5].

Department of ENT, The Children Hospital, Lahore
** Assistant Prof. ENT,FJMC/Sir Ganga Ram Hospital, Lahore*
***Assistant Prof. ENT, Nawaz Sharif Social Security Teaching Hospital, Lahore*
Correspondence to Dr. Imran Saeed, Assistant Professor Email: drimransaeed@gmail.com

Enlargement of the inferior turbinate is a common cause of nasal airway obstruction[7]. Deviation of nasal septum to one side is often associated with inferior turbinate hypertrophy on the contra lateral side[8]. Surgical treatment becomes necessary when medical treatment fails[9]. Surgical reduction of the turbinates is frequently performed by otolaryngologists. CO_2 LASER, Conventional electrocautery, Cryotherapy, Chemosurgery, total or surface cautery, out fracture, sub mucous turbinectomy, sub mucosal diathermy and Argon plasma surgery are the surgical techniques which have been used to reduce the size of hypertrophied inferior turbinate[9,10]. Laser turbinectomy has been known to cause relapse of turbinate hypertrophy[10] as does endoscopic turbinectomy and requires special instruments. Electrocautery, chemocautery, total turbinectomy, and cryosurgery are destructive techniques[11,12]. Both surface cautery and submucosal diathermy are relatively safe and effective[13,14].

In 1980 Bhargava reported that cautery of the anterior portion of both inferior turbinate and the nasal septum with 15% Silver Nitrate was a simple

and effective treatment for allergic and vasomotor rhinitis. The inflammatory exudate was scanty, with a conspicuous absence of eosinophils. There was vascular proliferation and mild fibrosis due to the action of Silver Nitrate[16].

The old practice of reducing the irritability of the throat by painting it with dilute solution of Silver Nitrate was the basis for the new method of treating case of rhinitis with rhinorrhoea and sneezing. Local application of Silver Nitrate 20% to certain areas on mucosa of the inferior turbinate and septum also carried out. The treatment is simple, effective and has few side effects[18].

Mabry popularized a surface cautery technique, which involved partial removal of turbinate bone with lateral mucosa under direct visualization with a nasal speculum and headlight[19].

MATERIAL AND METHODS

This Quasi experimental study was carried out in the Department of ENT; Sir Ganga Ram Hospital Lahore for a period of one year from 01-01-2012 to 31-12-2012. Total subjects were 60; (30 in each group). Sampling technique was non probability purposive sample with random allocation to the two study groups using random number table.

Patients with persistent nasal obstruction due to enlarged inferior turbinates not decreasing in size with application of vasoconstrictor pack were included in the study. Patients with history of previous nasal surgery, infectious rhinitis, marked septal deviation, nasal polyps or sinusitis contributing to nasal obstruction were excluded from the study.

Ethical consideration: All patients were explained in detail and consent form where given in which brief summary, nature of surgical intervention, likely risk and benefit of the procedures is explained. Institution Review Board of Sir Ganga Ram Hospital was informed about the study.

The data were entered in the SPSS version 10 and were analyzed through this software. Age was presented as mean±standard deviation. Gender and number of patients with relief from nasal obstruction were presented as percentages. Two methods were compared in relation to relief from nasal obstruction. Since this outcome is qualitative in nature, chi square test were applied and $p \leq 0.05$ were considered significant. The success and failure of the two techniques were also investigated in terms of some of the basic variables like age, duration of symptoms etc. Chi square test was also applied to test significance.

RESULTS

In Group I, 6 patients (20%) were ≤20 years of age and in Group II, 2 patients (6.7%). Between age 21-30 years, 8 patients (26.7%) were in group I and 13 (43.3%) in group II. In 31-40 of age, 13 patients (43.3%) in group I and 14 patients (46.7%) in group II. and in >40 years of age, three patients (10.0%) in group I and only one patient (3.3%) in group II. The mean age of group I, 30.17±1.74 SEM, and 30.17±1.26 years in group II ($p>0.05$) (Table 1).

There were 9 female patients (30.0%) in group I and 16(53.3%) in group II. Similarly there were 21male patients (70.0%) in group I and 14 (46.7%) in group II. The male to female ratio was 2.3:1 in group I and 1:1.14 in group II.

Twenty nine patients (96.67%) of both groups had bilateral nasal obstruction and only one patient (3.33%) of both group had unilateral nasal obstruction (Table 2).

Twelve patients (40%) of both groups had duration of complaints 1-5 years and 14 patients (46.67%) of both groups had complaints for 6-10 years. Only four patients (13.33%) of each group had complaints more than 11 years. Average duration of complaints was 7.63±0.81 and 7.80±0.77 years (Table 3).

Twenty three patients (76.67%) of group I and 28 patients (93.33%) of group II had bilateral hypertrophy of the inferior turbinates. Seven patients (23.33%) of group I and only two patients (6.67%) of group II had unilateral hypertrophy (Table 4).

Twenty seven patients (90%) of group I and 29 patients (96.67%) of group II had anterior nasal packing. Only three patients (10%) of group I had posterior nasal packing and only patient (3.33%) of group II had no packing (Table 5).

Within 24 hours, packs were removed of 16 patients (53.33%) of group I and in 14 patients after 48 hours. In group II, all patients packs were removed after 24 hours (Table 6).

Follow-up of 1st Week: Crusting was seen in all patients (30) of group I and 10 patients (33.3%) in group II. Bleeding was seen in 11 patients (36.7%) of group I and 6 patients (20%) of group II. Adhesions were noted in 12 patients (40%) of group I and 5 patients (16.7%) of group II. Nasal obstruction was present in all patients of both groups (Table 7).

Follow-up of 4th Week: Crusting was seen in 9 patients (30.0%) of group I and 2 patients (6.7%) in group II. Bleeding was seen in 4 patients (13.3%) of group I and only one patient (3.3%) of group II. Adhesions were noted in 7 patients (23.3%) of group I and only one patient (3.3%) of group II. Nasal obstruction was not present in all patients of both groups (Table 8).

Table 1: Age distribution

Age in years	Group I	Group II
≤20	6(20%)	2(6.7%)
21-30	8(26.7%)	13(43.3%)
31-40	13(43.3%)	14(46.7%)
>40	3(10%)	1(3.3%)
Mean±SEM 30.17±1.74		30.17±1.26 years

Table 2: Nasal Obstruction

Nasal obstruction	Group I	Group II
Bilateral	29(96.67%)	29(96.67%)
Unilateral	3(3.33%)	3(3.33%)

Table 3: Duration of Complaints

Duration (yrs)	Group I	Group II
1-5	12(40%)	12(40%)
6-10	14(46.67%)	14(46.67%)
11-15	2(6.67%)	3(10%)
16-20	2(6.67%)	1(3.33%)
Mean±SEM 7.63±0.81		7.80±0.77 years

Table 4: Inferior Turbinate Hypertrophy

Hypertrophy	Group I	Group II
Bilateral	23(76.67%)	28(93.33%)
Unilateral	7(23.33%)	2(6.67%)

Table 5: Nasal Packing

Packing	Group I	Group II
Anterior	27(90%)	29(96.67%)
Posterior	3(10%)	-
No pack	-	1(3.33%)

Table 6: Pack removal (hours)

Time (hours)	Group I	Group II
24	16(53.33%)	29(96.67%)
28	14(46.67%)	-
Mean±SEM 35.2±2.22		24 hours

Table 7: Follow-up: complications at 1st Week

Complications	Group I	Group II
Crushing	30(100%)	10(33.3%)
Bleeding	11(36.7%)	6(20%)
Adhesions	12(40%)	5(16.7%)
Nasal obstruction	30(100%)	30(100%)

Table 8: Follow-up: Complications at 4th Week

Complications	Group I	Group II
Crushing	9(30%)	2(6.7%)
Bleeding	4(13.3%)	1(3.3%)
Adhesions	7(23.3%)	1(3.3%)
Nasal obstruction	-	-

DISCUSSION

Various forms of surgical techniques for reduction in the size of hypertrophied inferior turbinate are being employed and studied at different centres throughout the world. From time to time reports covering the various aspects of turbinate surgery are published. Surgical reduction of the inferior turbinates can be performed by various techniques. Lateral outfracturing of the inferior turbinate using a blunt elevator is a technique with minimal morbidity that results in temporary improvement as the turbinate eventually resumes its original position[20]. [55] Destructive procedures, including electrocautery, cryosurgery, or laser surgery, have been used to reduce the bulk of the turbinates by inducing scarring or by direct destruction. These procedures can be performed under local anesthesia and are technically simple to perform, but have available long term success and significant risks, including necrosis of the conchal bone, eschar formation, and hemorrhage[21]. Long-term studies of partial resection of the inferior turbinates have cited nasal airway improvement ranging from 41% to 90%[21]. Complications, including synechiae, prolonged crusting, and bleeding, occur relatively frequently. Hemorrhage requiring anterior nasal packing or operative cautery of bleeding vessels has been reported to occur in upto 10% of cases[20]. The total inferior turbinectomy procedure is rarely performed because of the risk of rhinitis sicca. House first described a submucous resection of the inferior turbinate bone without resection of the inferior turbinate mucosa[22].

In present study, we compared surface cautery and submucosal diathermy for the treatment of inferior turbinate hypertrophy. Both these procedures are simple and easy to perform.

SMD leads to a dramatic fall in nasal obstruction but if the patients do not have concurrent medical treatment, inferior turbinate re-hypertrophies within 15 months. Many rhinologists only advocate SMD in those cases where inferior turbinate shrinks with an alpha receptor agonist. While this is indeed a very good predictor of satisfactory outcome of SMD, it is not diagnostic and many patients show good response in spite of turbinate showing no decongestion. SMD is done with an insulated needle at three different points. Anterior nasal packing is done to control bleeding[23].

Usually turbinate surgery accompanies nasal septal surgery. Li et al[24] compared the results of septoplasty alone and septoplasty combined with turbinate surgery in terms of changes in minimal cross sectional area and patients satisfaction. Patients who had both procedure performed had significantly greater satisfaction than those who had septoplasty alone. In our study 11 patients of group I and 3 of group II had septal surgery along with turbinate reduction.

The inferior turbinate derives its blood supply predominantly from the sphenopalatine artery which is of external carotid artery origin. The submucosal venous plexus in the nose drains, ultimately, through

the external and internal jugular veins. Submucosal diathermy causes coagulation of the venous sinusoids within the turbinate leading to subsequent fibrosis. We feel it is possible that, in this case, the diathermy caused emboli to pass, via the submucosal venous plexus, stasis and subsequent ischaemia of the superior division of the oculomotor nerve or of the muscles themselves. This theory would also account for the localized sensory loss noted in the case previously reported[25].' In our study none of the patients experienced such loss.

CONCLUSION

Surface cautery is easy to follow, but failure rate is high, whereas SMD is procedure with less failure rate and less discomfort postoperatively. For symptomatic inferior turbinate hypertrophy, where topical nasal decongestant has little role, SMD is the treatment of choice for longer relief.

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