COMPARISON OF NASAL PATENCY AFTER INFERIOR TURBINATE SURGERY WITH MICRODEBRIDER AND TURBINECTOMY SCISSORS

Chaudhry Muhammad Bilal Akram, Zahid Mahmood Raahat*, Mubashir Iqbal*, Fatima Bilal**

Pakistan Air Force Hospital, Faisal Base Karachi Pakistan, *Combined Military Hospital Lahore / National University of Medical Sciences (NUMS) Pakistan, **Fauji Foundation Hospital Rawalpindi Pakistan

ABSTRACT

Objective: To compare the frequency of improvement of nasal patency following inferior turbinate surgery with microdebrider and turbinectomy scissors.

Study Design: Randomized controlled trial.

Place and Duration of Study: The study was conducted at ear, nose, throat (ENT) Department of Combined Military Hospital (CMH) Peshawar from Sep 2013 to Feb 2014.

Material and Methods: A total of 120 patients diagnosed as inferior turbinate hypertrophy with severe nasal obstruction (visual analogue scale >8) were endorsed in the study out of 157 patients who reported with the same illness. Rest (37) were excluded due to coagulation disorders (14), previous surgeries (12), and refusal to participate in the study group (11). Out of 120 patients, 60 patients underwent inferior turbinate surgery with micro-debrider (group A) and 60 underwent inferior turbinectomy by using turbinectomy scissors (group B). The randomization was done with the help of random number tables. Nasal patency was documented 3 weeks after the surgery according to visual analogue score. Observer and the patient did not know the type of surgery performed. The data procured regarding improvement in nasal patency was entered in a specially designed proforma.

Results: In our study results supported our hypothesis in proving that post-operative nasal patency is better following inferior turbinate surgery with microdebrider as compared to inferior turbinectomy with scissors. The *p*-value of significance was 0.001.

Conclusion: Microdebrider assisted inferior turbinate surgery should be considered surgery of choice in managing inferior turbinate hypertrophy. It is effective in improving nasal patency with minimum side effects.

Keywords: Inferior turbinate, Inferior turbinectomy, Microdebrider, Nasal patency.

INTRODUCTION

The lateral wall of nose contains three paired bony projections named as superior, middle and inferior turbinates. These turbinates are enclosed in mucous membrane. The inferior turbinate is a separate shelf like bony projection that is attached to the inferior part of lateral wall of nose. There are also three corresponding meati on lateral nasal wall named as superior, middle and inferior meatus. Inferior meatus provides drainage for the nasolacrimal duct[1].

The inferior turbinate helps in directing, moistening, warming, and purifying the inspired air. The overlying mucous membrane of turbinates expands and contracts as a result of alterations in blood flow. Recumbent position, certain diets, allergies, drugs, hormones and different diseases can alter blood flow resulting in hypertrophy of inferior turbinates. Various medical conditions including intrinsic rhinitis, allergic rhinitis, rhinitis medicamentosa and chronic hypertrophic rhinitis can also often result in hypertrophy of the inferior turbinates. The swollen inferior turbinates can cause nasal obstruction, resulting in inhalational difficulties, posterior nasal discharge and headache due to decreased aeration of paranasal sinuses[1,2].

Medical or surgical reduction in the size of hypertrophied turbinates is very important to

Correspondence: Dr Chaudhry Muhammad Bilal Akram, ENT Specialist PAF Hospital Faisal Base Karachi Pakistan
Email: bilal2182@hotmail.com
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establish adequate airway which will lead to aeration of paranasal sinuses and will abate the symptoms. Various medical treatments including antihistamines, nasal decongestants (topical and oral), steroids, mast cell stabilizers, and immunotherapy provide symptomatic relief only. The patients resistant to medical treatment require surgical intervention[1,2].

The goal of surgical reduction of hypertrophied inferior turbinates is to increase the airway, reserve mucosal utility and to decrease the rate of complications with reduction of sub mucosal bony tissue. Worldwide various surgical techniques are available to treat inferior turbinate hypertrophy. These include inferior turbinectomy with the help of turbinectomy scissors, sub mucosal reduction of inferior turbinate with the help of microdebrider, sub mucosal diathermy, surface cautery, radiofrequency ablation, laser-assisted resection or ablation and cryosurgery[2].

Inferior turbinectomy with the help of turbinectomy scissors has been described to relieve chronic nasal obstruction due to hypertrophied inferior turbinates but this procedure can lead to several complications like post-operative bleeding[3], pain, excessive crusting and poor healing[4]. A latest surgical technique of using microdebrider to reduce the size of hypertrophied inferior turbinate sub mucosally is a better and highly recommended approach with minimal side effects. Microdebrider allows precise and incremental tissue removal, preserving the mucosa, thereby preventing post operative bleeding and crusting associated with inferior turbinate surgery[5,6].

The effectiveness of inferior turbinate surgery with microdebrider has been compared with inferior turbinectomy by using turbinectomy scissors in local and international studies. According to the different evidence based studies up to 95% of patients undergoing inferior turbinate surgery with the help of microdebrider and around 80% of patients having inferior turbinectomy with the help of turbinectomy scissors had improvement in nasal patency post operatively[6]. Inferior turbinate surgery with the use of microdebrider should be favored if accessible because it has effective subjective and objective outcome both in short and long-term[7,8].

Locally different studies have been done on inferior turbinate surgery with the help of microdebrider as well as on inferior turbinectomy by using turbinectomy scissors. In these studies it is recommended that microdebrider is relatively simple, easier and safer procedure than use of turbinectomy scissors. The improvement in post-operative nasal patency needs to be compared in both procedures, as very few studies compared both these procedures and the technique which showed good results will be adopted in future.

PATIENTS AND METHODS

This randomized controlled trial was conducted for six months at Department of Ear Nose and Throat in Combined Military Hospital Peshawar from September 2014 to February 2015. After taking permission from hospital ethical committee, patients of inferior turbinate enlargement fulfilling the inclusion criteria (inferior turbinate hypertrophy with nasal obstruction value of greater than 8 on visual analogue scale, resistant to medical treatment, both genders and age above 12 years) and exclusion criteria (history of coagulation syndromes and prior turbinate operations) were selected through non probability convenience sampling.

After taking an informed written consent from patients to take part in the study, the age, name, serial number, gender, hospital record number, residential address and contact number of each individual were noted. A total of 120 patients diagnosed as inferior turbinate hypertrophy with severe nasal obstruction (visual analogue scale >8) were selected by using WHO sample size calculation in which level of significance was 5%, power of test was 80%, anticipated population proportion P1 was 95%[6] and anticipated population proportion P2 was

80%[8]. The patients were allocated randomly into two groups by using the random numbers table.

Group A included 60 patients who underwent inferior turbinate surgery by submucosal resection with the help of microdebrider while in group B 60 patients underwent inferior turbinectomy by in-fracturing the inferior turbinate followed by excision of hypertrophied part of inferior turbinate with the help of turbinectomy scissors.

Surgeries in all patients were carried out by a trained specialist surgeon under general anesthesia and after the surgery bilateral nasal packing of paraffin gauze was placed.

After the surgery all patients were given medical treatment including tablet co-amoxiclav 625 mg eight hourly, tablet mefenamic acid 500 mg eight hourly and tablet chlorpheniramine maleate 4mg twelve hourly for five days. Nasal packs were removed after two days. Patients were advised, oxymetazoline nasal spray and saline nasal douches for five days.

Nasal patencies of the patients who underwent surgeries were documented in the proforma after three weeks of surgery according to visual analogue scale. Observer and the patient did not know the type of surgery performed.

The final data were entered in SPSS version 10 and validated through dual entry. The variables included numerical data like age and qualitative data like gender and post operative nasal patency. Mean and standard deviation were calculated for numerical data (age). Frequency and percentages were calculated for qualitative data. Effectiveness in terms of frequency of improvement in postoperative nasal patency in both groups was evaluated.

The comparison of group A and B was made regarding frequency of improvement in nasal patency after inferior turbinate surgery with microdebrider and inferior turbinectomy with the use of turbinectomy scissors.

Chi-square test was used to compare both groups and to observe the significance of results. The *p* value of significance was taken as <0.05. The final data representation comprised cross tabulation and tables.

RESULTS

The study included 120 patients with inferior turbinate hypertrophy. The age of patients was from 13 to 50 years. Mean age in group A was 28.87 ± 7.12 years. Mean age in group B was 29.18 ± 7.74 years. In group A 47 (78%) patients were males and 13 (22%) were females. In group B 31 (51.7%) patients were males and 29 (48.3%) were females. Both the groups were comparable with respect to age ($p<0.05$) and gender ($p>0.05$). After 3 weeks, out of 60 cases who underwent inferior turbinate surgery with microdebrider, 57 (95%) had marked improvement in nasal patency while 3 (5%) had no improvement. Among the patients of group B, at 3 weeks interval 43 (71.7%) showed marked improvement while 17 (28.3%) had no improvement.

The study results supported our hypothesis in proving that the nasal patency is better following inferior turbinate surgery with microdebrider as compared to inferior turbinectomy by using turbinectomy scissors. This is clearly evident by the data analysis done in SPSS version 10 which shows *p* value of 0.001 after three weeks analysis by applying chi-square test. The overall *p* value of 0.001 describes that in our study hypothesis is proven (table-I & II).

DISCUSSION

In our study results revealed that the nasal patency is better following inferior turbinate surgery with microdebrider as compared to inferior turbinectomy with the help of turbinectomy scissors. The overall *p* value of 0.001 significantly describes the fact that in our study hypothesis is proven.

The group A in which the patients were treated with inferior turbinate surgery with microdebrider, 95% showed marked post-operative improvement. The studies done worldwide support the findings of our current study. According to previous studies up to 95%

of patients having inferior turbinate surgery with the help of microdebrider and around 80% of patients having inferior turbinectomy by using turbinectomy scissors had good nasal obstruction relief post operatively[6-8]. Worlwide the results of several trials confirm the efficacy and safety of simultaneously removes tissue debris allowing better visualization of the field. Post operatively this procedure has decreased chances of relapse of symptoms, provides rapid healing with low complication rates, especially postoperative crusting, 6 dryness, infection, bleeding and

Table-I: Effectiveness of each treatment (nasal patency after 3 weeks of surgery).

Groups	Efficacy (nasal patency after 3 weeks)		
	Effective (improvement in nasal patency)	Non Effective (no improvement in nasal patency)	Total
A (Inferior turbinate surgery with microdebrider)	57 (95%)	3 (5%)	60
B (Inferior turbinectomy with scissors)	43 (71.7%)	17 (28.3%)	60
Total	100	20	120

Cross tabulation showing effectiveness of both surgeries in terms of improvement in nasal patency three weeks after surgery.

Table-II: Chi-Square test.

	Value	Df	*p*-value of significance
Pearson chi-square	11.760	1	0.001
No of valid cases	120		

Computed only for 2x2 table. A *p*-value of significance is 0.001.

microdebrider[9-11]. only or comparing it with other modalities including radio frequency ablation, laser and submucosal electric cautery. Most of these studies have reported the success rate ranging from 90% to 100%. Few studies differ in terms of small sample size, difference in comparison group and inclusion of control group as compared to our study[12,13].

Locally a study from Services Hospital Lahore has proposed that endoscopic microdebrider assisted turbinoplasty is a very good surgical option for reduction of hypertrophied inferior turbinate and improvement of nasal obstruction with minimal side effects but the sample size in that study was small as compared to our study[13].

Based on the findings of our and previous studies, the proposed recommendations are that the microdebrider is an effective tool for inferior turbinate surgery which is harmless, because of maximum preservation of nasal mucosa and there is a reduced risk of excessive or inadequate resection during the operation. It has the ability to rapidly remove the obstructing tissue and pain[14].

Inferior turbinectomy with the help of turbinectomy scissors is less effective procedure and has been described to relieve chronic nasal obstruction due to hypertrophied inferior turbinate but the procedure has several complications as well like increased chances of relapse of symptoms, post-operative bleeding[3], pain, crusting and poor healing[4].

Although numerous studies have addressed the effective role of microdebrider but there are very few evidence based studies from comparative research aiming on the differences in duration of surgery, bleeding and safety between the microdebrider and other surgical techniques.

Accumulating research evidence suggests that in assessing the various techniques of turbinate surgery, one should focus on preserving the functions of the turbinate with less side effects and optimal nasal functioning.

The results of this study will be applied on the patients having nasal obstruction due to inferior turbinate hypertrophy in the locality.

LIMITATIONS

Certain problems were encountered during this study that needs to be elaborated.

- The microdebrider assisted surgeries can damage the normal tissue, due to pressure effects. It is a safe procedure but requires proper specialized training.
- The microdebrider has disposable parts and in limited resources it can be very costly and sometimes it is not easily available.
- The current study was conducted in a small sample. The larger sample size and long follow up is required to generalize the results.
- There was a lack of control group with patients on medical treatment only.

CONCLUSION

Microdebrider assisted inferior turbinate surgery should be considered surgery of choice in managing inferior turbinate hypertrophy. It is effective in improving nasal patency with minimum side effects.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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