DOI: https://doi.org/10.53350/pjmhs20221611696

ORIGINAL ARTICLE

Comparison of Conventional Surgical Turbinoplasty Versus Microdebrider Assisted Turbinoplasty in Cases of Inferior Turbinate Hypertrophy

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ABSTRACT

Objective: To compare the conventional surgical turbinoplasty versus microdebrider assisted turbinoplasty in cases of inferior turbinate hypertrophy.

Design of the Study: It was a cross-sectional survey.

Place and Duration of Study: This study was carried at the Department of ENT Nishtar Medical University and Hospital, Multan from January 2022 to June 2022.

Patients and Methods: Patients with hypertrophy of the inferior turbinates, the most common cause of nasal obstruction, were split into two groups of 30. The size of the inferior turbinates was classified as Grade I if they took up less than a third of the nasal cavity, Grade II if they took up more than a third but less than half, and Grade III if they took up more than half. Each group had either a standard partial inferior turbinectomy or a turbinoplasty with the help of a microdebrider. Visual evaluation was used to categorise blood loss during and after surgery. Patients were checked on at 1, 2, 4, and 6 months after surgery. Relief from symptoms and the occurrence of problems such crusting and synechiae formation were evaluated.

Results of the Study: Both groups showed comparable significant improvements in nasal blockage. Most patients in the CPIT group experienced intraoperative blood loss of grade II (66.66%) or grade III (10%). When the packs were taken off, 60% of patients experienced grade I blood loss, 36.66% experienced grade II blood loss, and 3% experienced grade III blood loss after surgery. Most patients (46%) and surgeons (40%) in the MAT group experienced grade II or higher intraoperative blood loss. The majority of patients' postoperative blood loss was classified as grade I. Six months later, 6.66 percent of the CPIT group had acquired crusting, and 6.66 percent had developed synechiae. Those that received MAT did not have these problems.

Practical implication: The choice of surgical procedure is up to the surgeon's attitude and experience due to the lack of agreement regarding their efficacy. That's why we compared the effectiveness of these treatment methods for turbinate reduction in order to provide evidence to evaluate the results of the several surgical techniques in local population.

Conclusion: According to the findings, both surgical approaches are effective in addressing nasal blockage. Complications are less likely to occur with microdebrider-assisted inferior turbinoplasty since the mucosa and nasal physiology are preserved.

Keywords: Microdebrider assisted inferior turbinoplasty, Hypertrophied inferior turbinate, Conventional partial inferior turbinectomy,

INTRODUCTION

Rhinologists frequently encounter the issue of chronic nasal blockage due to inflamed inferior turbinates. Inferior turbinate hypertrophy can be caused by a number of medical conditions, including vasomotor rhinitis, Allergic rhinitis, and the overuse of topical vasoconstrictors.[1,2]

While bone stays its usual size, the sub-mucosa swells, explaining why the turbinates are so much bigger than they should be. The swelling of the inferior turbinates, characteristic of intrinsic rhinitis, responds to decongestants because it is induced by the dilation of the submucosal venous sinusoids. When decongestants, intranasal corticosteroid sprays, antihistamines, corticosteroid injections, and other medical interventions fail to alleviate the symptoms of submucosal fibrosis-related enlargement of the inferior turbinates, a turbinate reduction operation may be necessary.[3,4] In contrast to the bone, which remains its usual size, the sub-mucosa swells, which is the primary cause of the larger turbinates. Dilated submucosal venous sinusoids are responsible for the enlarged inferior turbinates seen in intrinsic rhinitis, which respond to decongestants. Submucosal fibrosis can cause swelling of the inferior turbinates, and treatment with antihistamines, decongestants, corticosteroid injections, intranasal corticosteroid sprays, or surgery (turbinate reduction) may be necessary in some cases.[5,6]

When medication therapy for hypertrophy inferior turbinates or vasomotor rhinitis fails, a well-described surgery known as inferior turbinate excision is used to alleviate the symptoms. There are a number of methods for reducing the size of the turbinates, including submucous diathermy, turbinectomy, CO2 laser turbinoplasty, cryotherapy, Coblation channelling, inferior turbinoplasty, and others. Short-term and long-term problems, such as bleeding, crusting, and recurrent turbinate hypertrophy, have been linked to each surgical approach.[7,8] The rotation motor of the microdebrider can be attached to various dissectors and drills, allowing for precise removal of bone and soft tissue. Because the linked aspirator collects the resected material and any blood, the surgical site is kept clean, allowing for enhanced visibility during the procedure. Microdebriders, with their perfused cooling agents within the safety tube, also aid in minimising harm to neighbouring tissue.[9] Complications following turbinate operations include synechiae production, crust formation, atrophic rhinitis and dryness. Different surgical procedures, ranging from total turbinectomy to restricted submucosal cauterization, are used to reduce the size of the inferior turbinates.[10]

With the help of a microdebrider, an inferior turbinoplasty can successfully reduce turbinate volume while still allowing the turbinates to perform normally. The purpose of this study was to evaluate the efficacy and safety of microdebrider turbinoplasty against traditional partial inferior turbinectomy in the treatment of hypertrophy inferior turbinates associated with nasal obstruction.

PATIENTS AND METHODS

This cross-sectional study was carried out between January 2022 to June 2022 at Department of ENT Nishtar Medical University and Hospital, Multan from. A total of 60 patients (both sexes, ages 18-50) with nasal obstruction due to hypertrophied inferior turbinates and either allergic or non-allergic rhinitis were included in this study. Nasal obstruction-free patients were not included in the study, nor were those with chronic granulomatous disease, acute

rhinitis, a history of nasal operations, Sino nasal polyps, coagulopathies or tumours.

There were sixty (60) patients enrolled in the study, all of whom had hypertrophied inferior turbinates and had sought medical attention for nasal blockage. Patients gave their signed consent after receiving necessary information. In every case, the diagnosis was made after taking a patient's medical history, which included complaints of nasal obstruction as well as sneezing, headaches, and nasal discharge. Subjective ratings of pain were used to classify nasal obstruction into three levels of severity: mild, moderate, and severe.

A thorough medical checkup was performed. Using a calibrated steel plate and a method involving calm nasal breathing, the severity of nasal blockage was objectively measured and ranked (Graded cold spatula test). In order to evaluate the nasal disease and the hypertrophy of the inferior turbinates, an anterior and a posterior rhinoscopy were performed. Initial evaluation required a nasal endoscopy for diagnosis and document nasal disease, sinus disease, nasal passage and to grade inferior turbinate hypertrophy. One group underwent inferior turbinoplasty with microdebrider and the other group underwent conventional partial inferior turbinectomy. All surgeries were done under General anaesthesia.

Partial inferior turbinectomy (PIT) is performed by infiltrating the inferior turbinate with adrenaline and xylocaine (1:1000) along its length. Using a blunt freer elevator, the inferior turbinates were shattered, and the mucosa was afterwards crushed using clamp forceps to prevent bleeding. The anterior and central parts of the inferior turbinate were removed using turbinectomy scissors, with care taken to cut medially to the crushed part.

Using a 4mm 00 endoscope for vision, 2% lignocaine + Adrenaline(1:2,00,000) was infiltrated along the whole length of the inferior turbinate. Utilizing a Freer's elevator, a submucosal tunnel was carved out down the full length of the inferior turbinate. By inserting a microdebrider with the speed set to 3000 revolutions per minute (rpm), we were able to remove the mucosa from the lateral aspect of the inferior turbinate, revealing the underlying bone. We used turbinectomy scissors to raise the mucosa over the medial portion of the inferior turbinate, and then we resected about three-quarters of the underlying turbinate bone. Nose bleeding or obstruction was found upon inspection. The surgeon working on the patient was instructed to visually examine the bleeding and assign a severity rating of light, moderate, or severe. After 1 week, the nasal splints were taken off.

After 48 hours, the nasal packs were taken off. Again, ocular assessment was used to classify bleeding as mild, moderate, or severe during pack removal. At 1, 3, and 6 months post-op, patients were evaluated for symptom improvement using a graded cold spatula test, nasal examination, and nasal endoscopy. Bleeding, crusting, and the development of synechiae were all noted.

The data was entered and analysed using SPSS-20 (a statistical package). The charts were made in Microsoft Office 2010. The mean and standard deviation were used to illustrate the spread of numerical data, whereas the frequency distribution method was used to illustrate the spread of qualitative information. When comparing three or more percentages, the Chi-square test was utilised.

STUDY RESULTS

A total 60 cases of bilateral (B/L) nasal obstruction who had deviated nasal septum (DNS) with B/L hypertrophied inferior turbinates (HIT) were chosen for the study. Out of 60 patients, 48patients were males and 12 patients were females. Patients were divided into 2 groups of 30 each . 30 were taken up for microdebrider assisted inferior turbinate reduction and 30 were taken up for conventional partial inferior turbinectomy. Nasal obstruction was graded as Mild difficulty, Moderate difficulty on routine work and Severe difficulty when present at rest.

All 60 patients had deviated nasal septum (DNS) and B/L hypertrophied inferior turbinates. All had a narrow nasal passage. Mucoid nasal discharge was present in12 patients (40%) in CPIT group and in 10 patients (33.33%) in MAT group. Majority of patients in CPIT group i.e., 80% had grade II and 13.3% had gradeIII and 6.7% had Grade I nasal breathing. Majority of patients in MAT group i.e., 70% had grade II and 20% had grade III and 10% had grade I nasal breathing. In CPIT group, turbinate size was grade II in 16.66% patients & grade III in 83.33% patients. In MAT group, turbinate size was grade II in 33.33%patients & grade III in 66.66% patients.

In CPIT group, 23.33% patients had grade I bleeding, 66.66% patients had grade II bleeding and 10% patients had grade III bleeding. In MAT group, 40% patients had grade I bleeding, 46.66% patients had grade II bleeding and 13.33% patients had grade III bleeding. The difference seen between CPIT group and MAT group with relation to intra operative bleeding is statistically significant with Chi-Square value = 15.665; degree of freedom = 2; and p value <0.05.

In CPIT group; bleeding was of grade I in 60% patients, grade II in 36.66% patients and grade III in 3.33% In MAT group; bleeding was of grade I in 90% patients and grade II in 10% patients. The difference seen between CPIT group and MAT group with relation to post operative bleeding is statistically significant with Chi-Square value = 29.655; degree of freedom = 2; and p value <0.05.

In CPIT gp: At 1st week of follow up, cold Spatula test was Grade III in 21 patients (70%); Grade II in 8 patients (26.66%) and grade I in 1 patient (3.33%). At follow up at 1 month, 3 month& 6 month; Cold spatula test was grade IV in 25 patients(83.33%) and grade III in 5 patients(16.66%) In MAT group: At 1st week, cold spatula test was grade IV in 12 patients (40%); gradeIII in 14 (46.66%); grade II in 2 (6.66%) and grade I in 2 (6.66%). At follow up at 1 month, 3 month & 6 month; Cold spatula test was Grade IV in 29 (96.66%) and grade III in 1 (3.33%). Postoperative DNE revealed inferior turbinate size of Grade I in all the patients in both groups.

In CPIT group: At 1st week follow up; 10 pts(33.33%) had mild crusting and 20 pts (66.66%) had moderate crusting. At 1 month follow up; 9 pts(30%) had mild crusting. At 3 month and 6 month follow up 2 pts(6.66%) had mild crusting.

Table 1:

Characterstics	Variables	Conventional partial inferior turbinectomy (CPIT)		Microdebrider assisted inferior turbinoplasty (MAT)	
Signs	Deviated nasal septum	30	100	30	100
	Hypertrophied inferior turbinates	30	100	30	100
	Nasal Passage	30	100	30	100
	Discharge	12	40	10	33.33
Symptoms	Nasal Obstruction	30		30	
	Discharge	12		10	
	Headache	5		3	
	Sneezing	12		10	
Graded Cold Spatula Test	I	2	6.7	3	10
	II	24	80	21	70
	III	4	13.3	6	20
	IV	0	0	0	0

Table 2: Subjective Assessment of Nasal Breathing

Characterstics	Variables	Conventional partial inferior turbinectomy (CPIT)		Microdebrider assisted inferior turbinoplasty (MAT)	
Nasal breathing	Mild	0	0.0%	0	0.0%
	Moderate	6	20.0%	14	46.66%
	Severe	24	80.0%	16	53.33%
Inferior Turbinate Size	G1	0	0.0%	0	0.0%
	GII	5	16.66%	10	33.3%
	GIII	25	83.3	20	66.6%

At 1st week follow up 2 pts(6.66%) had synechiae which was present at 1 month, 3 month and 6 month follow up.

In MAT group: At 1st week follow up; 30 pts(100%) had mild crusting. The difference seen between CPIT group and MAT group with relation to crusting is statistically significant with Chi-Square value = 30; degree of freedom = 1; and p value <0.05

Table 3: Comparison of blood loss between two groups intraoperativel and postoperatively

Characterstics	Variables	Conventional partial inferior turbinectomy (CPIT)		Microdebrider assisted inferior turbinoplasty (MAT)	
Blood Loss Intraoperatively	Mild	7	23.33%	12	40.0%
	Moderate	20	66.66%	14	46.66%
	Severe	03	10.0%	04	13.33%
Postoperative Blood Loss	Mild	18	60.0%	27	90.0%
	Moderate	11	36.6%	03	10.0%
	Severe	01	3.33%	0	0.0%

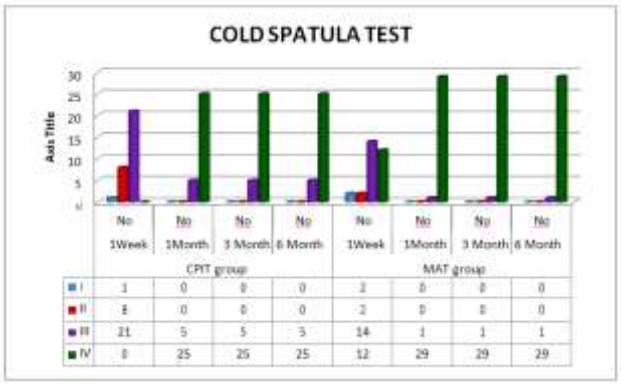

Figure 1: Postoperative Cold Spatula test. All patients in both groups showed improvement in nasal breathing on cold spatula test.

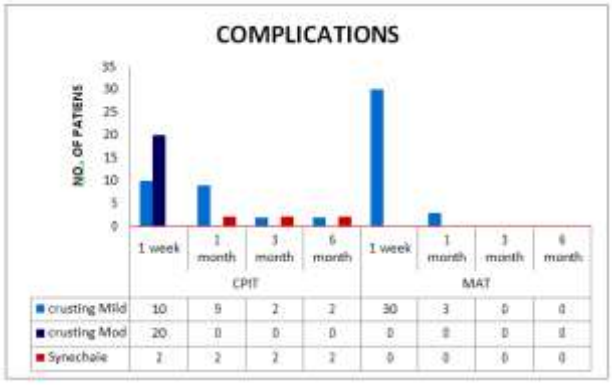

Figure 2: Post op complications observed in both groups

DISCUSSION

The most typical symptom seen in the outpatient rhinology section is nasal obstruction. Numerous nasal diseases, such a deviated nasal septum (DNS) or enlarged nasal turbinates, can result in nasal blockage. A variety of treatments can be used to reduce the turbinate through surgery. In evaluating the various methods of turbinate reduction, preserving the function of the turbinate is of utmost importance.[11,12]

In our study, we compared conventional inferior turbinectomy and microdebrider assisted turbinoplasty. Our study consisted of 60 patients. Age ranged between 18 to 50yr with mean age being 24yrs. Male constituted 80% while female patients constitued 20% in both the groups. In study by Hatem Badran et al. the study was similar to ours with 2 groups with comparable preoperative clinical findings.[13]

Postoperative blood loss at the time of pack removal in CPIT group was mild in 60%; moderate in36.66% and severe in 3.33% whereas in the MAT group the blood loss was mild in 90% and moderate in 10%. This difference in the two groups was statistically significant. In a study by Dawes et al. the incidence of haemorrage was 11.48% in pts who underwent inferior turbinectomy.[14] In study done by Hatem Badran et al. blood loss was 71mL (range, 38-273mL) for the microdebrider vs 161mL (range, 66-445mL) for surgical group.[13]

In a study by Passali et al. the incidence of haemorrage was 55% in pts who underwent inferior turbinectomy.[15] Thus, in our study, the incidence and severity of bleeding in MAT group was less in comparison to CPIT group.

In our study, the success rate of Conventional partial inferior turbinectomy in relieving nasal obstruction was 100% i.e., all 30 patients were relieved of their nasal obstruction at 1 month, 3 months and 6 months following surgery. At 1st week follow up; 33.33% had mild crusting and 66.66% pts had moderate crusting. At 1 month follow up; 30% pts had mild crusting. At 3 month and 6 month follow up 6.66% pts had mild crusting.

Success rate of Microdebrider assisted inferior turbinoplasty in our study was All 30 patients (100%) were relieved of nasal obstruction on postoperative follow up. Success rate in study by Hatem Badran et al. was, after 3 months, 86.6% in the microdebrider group versus 90% in the surgical group reported marked improvement of nasal obstruction.[13] Microdebrider assisted inferior turbinoplasty was compared to traditional partial inferior turbinectomy by.[16]

In MAT group, none of the patients had synechiae. In a study by Friedmann et al. synechiae developed in 5% pts.[17] In study synechiae developed in 6% patients.[18] In our study, the absence of development of synechiae in MAT may be probably due to precise tissue resection by microdebrider under direct vision minimizing damage to adjacent mucosa of nasal cavity.

The data showed that turbinoplasty offers the benefit of quick recovery, few surgical problems, and successful functional outcomes.The limitations of our study were short duration of the study and small study population. Objective assessment of nasal obstruction needs to be improvised with use of rhinomanometry.

CONCLUSION

According to the findings, both surgical approaches are effective in addressing nasal blockage. Complications are less likely to occur with microdebrider-assisted inferior turbinoplasty since the mucosa and nasal physiology are preserved.

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