

Microdebrider Technique for Management of Inferior Turbinate Hypertrophy

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Abstract

Background	Microdebrider-assisted turbinoplasty of inferior turbinate is a surgical procedure for reducing the size of turbinate and achieve patent nasal airways in a condition where an enlarged turbinate cause chronic nasal obstruction not responding to medical treatment.
Objective	To assess the results of microdebrider technique in the management of patients with chronic nasal obstruction due to inferior turbinate hypertrophy.
Methods	From January 2010 to March 2011, forty patients with chronic nasal obstruction due to inferior turbinate hypertrophy not responding to medical treatment were treated with microdebrider-assisted turbinoplasty. They were subjected to detailed study of medical history and clinical examination. Post-operative follow up was performed for subjective and objective evaluation up to one year.
Results	Thirty seven patients (92.5 %) had good airway passage during the first two weeks after operation and these results continued up to twelve months. The complications encountered with this procedure were limited to postoperative bleeding with no crusting or adhesions.
Conclusion	Microdebrider-assisted turbinoplasty is a safe procedure for achieving turbinate size reduction with acceptable morbidity in patients with nasal obstruction due to turbinate hypertrophy. Bleeding is a minimal complication. Preservation of mucosa leads to early healing and absence of crusting.
Keywords	Turbinate, partial turbinectomy, microdebrider

Introduction

Disturbances of nasal air flow occur in about 30% of the population causing nasal obstruction; one of the major causes of chronic nasal obstruction is diseases of inferior turbinate commonly inferior turbinate hypertrophy ⁽¹⁾; Chronic hypertrophic rhinitis, both allergic and non-allergic, in which there is swelling of the sub mucosa due to dilatation of the sub mucosal venous sinusoid ⁽²⁾, sometime, there is sub mucosal fibrosis ⁽³⁾. There is almost always compensatory structural hypertrophy of inferior turbinate on the concave side of the septal deviation, which sometimes does not

respond to medical treatment and needs surgery. Different surgical methods have been achieved for inferior turbinate hypertrophy. The efficacy of the surgical techniques in treating turbinate hypertrophy should be judged by two basic criteria: to diminish the complaints and to preserve the function of the turbinate; so, this endoscopic powered modification of the classic techniques is the quite acceptable from morphological and physiological point of view ⁽⁴⁾. This study aimed to assess the results of microdebrider technique in the management of patients with chronic nasal obstruction due to inferior turbinate hypertrophy.

Methods

This prospective study enrolled 40 patients who attended department of otolaryngology in Al-Kadhimiya Teaching Hospital, their age ranged from 11-50 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, no concha bullosa, patent postnasal space, no bony hypertrophy). The study is established over a period of 1 year, and the 40 patients with bilateral inferior turbinate hypertrophy were examined clinically with anterior rhinoscopy, endoscopically with nasopharyngoscopy and radiologically with CT scan. Full preoperative investigations were done. We classified inferior turbinate hypertrophy into three grades:-

Grade1: Normal size inferior turbinate, not atrophic without nasal obstruction.

Grade2: Moderate size inferior turbinate, not touching the septum, with nasal obstruction that responds to local decongestant.

Grade3: Large mulberry turbinate, touching the septum, with nasal obstruction that not responds to local decongestant.

The operation is done in all cases of grade 3 and some cases of grade 2 with nasal obstruction that does not respond permanently to medical treatment. The rhinomanometric examination was carried out one day preoperatively, and 6-12 weeks postoperatively using anterior rhinomanometer type 300 by ATMOS.

Microdebrider-assisted inferior turbinoplasty procedure was performed under general anesthesia. The anterior, inferior and posterior borders were infiltrated with 2% lignocaine and 1/100,000 adrenalin, an antero-inferior incision and sub mucosal pocket on inferior turbinate with a conventional 15 blade and freer elevator. The microdebrider unit was set at 4000-rpm oscillating mode, with inferior turbinate blade 4 mm size introduced in the sub mucosal pocket. A great care was taken to stay in the sub mucosal pocket and more lateral to avoid mucosal

perforation. Light nasal packing was done for 24 hours.

Postoperatively patients instructed to use nasal irrigation with sodium bicarbonate 2% three times daily for one week, analgesia, and antibiotic. The first visit was on the 7th day postoperatively, then monthly for 3 months, then at 6th month and at one year. At each visit the nose was examined for any bleeding, crusts which were removed, mucosal tear, nasal airway patency, and adhesion. Also asking about sneezing, nasal discharge, facial pain and patients smell.

Results

A total of 40 patients, 24 (60%) males and 16 (40%) females underwent microdebrider-assisted inferior turbinoplasty. In this study the age ranged from 11-50 years with a mean age of 34 years table 1.

Table 1. Age Distribution of the patients

Age Group (year)	No.	%
11-20	8	20
21-30	10	25
31-40	18	45
41-50	4	10
Total	40	100

The 40 patients had suffered from nasal obstruction due to inferior turbinate hypertrophy also those patients were suffering from mouth breathing; while 26 of these patients (65%) suffered from nasal discharge; 12 patients (30%) suffered from sneezing; 20 patients (50%) complaining from snoring; 4 patients (10%) suffered from hyposmia and 4 patients (10%) complaining from facial pain table 2.

CT scan of paranasal sinuses revealed mucosal thickening of maxillary sinuses in 30 patients (75%), thickening of ethmoidal sinuses in 16 patients (40%), and mucosal thickening of frontal sinuses in 4 patients (10%). Ten patients (25%) had no changes. Soft tissue shadow of

inferior turbinate hypertrophy was found in 40 patients (100%).

Table 2. Patients' Complaint

Complaint	No.	%
Nasal obstruction	40	100
Mouth breathing	40	100
Sneezing	12	30
Snoring	20	50
Nasal discharge	26	65
Hyposmia	20	50
Facial pain	4	10

Subjective symptoms such as nasal obstruction, sneezing, nasal discharge, bleeding, hyposmia and facial pain, were evaluated on the 7th day and in the first, second, third, sixth and twelve months after the procedure. The microdebrider-assisted inferior turbinoplasty was perfectly tolerated by the patients. No crusting and synechia were observed, and no post-operative bleeding except few drops after removal of packing and stopped spontaneously.

Table 3. Duration of Postoperative Airway Patency

Duration	No.	%
1 week	30	75
1 month	37	92.5
3 month	37	92.5
6 month	37	92.5
12 month	37	92.5

The severity of nasal obstruction improved significantly during the first week after operation, 30 patients with good airway, and 7 patients had moderate improvement, while 3 patients had no improvement. After one month, 37 patients had good airway passages and persisted till 12th month after operation, while 3 patients with mild improvement. This improvement was observed clinically (table 3). The severity of nasal discharge, sneezing, facial pain and hyposmia had significantly improved in the 1st week of operation and persisted in the

12th month after the operation table 4. Three patients developed mucosal tear but no mucosal loss and those managed by sodium bicarbonate 2% nasal douche and antibiotic for one week table 5. Table 6 shows the mean and the median of resistance preoperatively and postoperatively. The rhinomanometric examination was carried out one- day preoperatively, and 6–12 weeks postoperatively table 7.

Table 4. Preoperative and postoperative subjective and objective Data

Complaint	Preoperative	Postoperative improvement (%)	
		Yes	No
Nasal obstruction	100	7.5	92.5
Sneezing	30	0	100
Hyposmia	10	0	100
Nasal discharge	65	0	100
Facial pain	10	0	100

Table 5. Postoperative Complications

Complications	No.	%
Bleeding	0	0
Mucosal tear	3	7.5
Crusting	0	0
Synechia	0	0
Dryness	0	0

Table 6. Preoperative and Postoperative resistance (Pa/cm³/s)

Site	Preoperative		Postoperative	
	Mean	Median	Mean	Median
Right side	2.84	1.20	0.72	0.41
Left side	2.37	1.18	0.70	0.45
Total	0.82	0.52	0.26	0.21

Discussion

In this study, we treated 40 patients with chronic nasal obstruction due to inferior turbinate hypertrophy by microdebrider technique and we found that the nasal airway was significantly improved in 92.5% of the patients, with no crusting or adhesion. Most of the patients

developed headache postoperatively that disappeared after removing the pack from the nasal cavity. Improvement of nasal discharge, facial pain, sneezing and hyposmia were significantly good from second week to the ends of twelfth months after operation.

Table 7. Preoperative and postoperative measurement of airflow (cm³/s)

Air flow	Preoperative	Postoperative
Mean	266	730
Median	248	686

P = < 0.001 (Wilcoxon test)

Van Delden *et al* ⁽⁵⁾ after performing microdebrider assisted turbinoplasty for 100 patients during 1994-1997 found postoperative improvement in nasal patency occurred in 93% of patient. Friedman *et al* ⁽⁶⁾ at 1999, studied 112 patient who underwent bilateral microdebrider-assisted turbinoplasty and suggested that microdebrider usage in turbinoplasty is a safe method for achieving turbinate size reduction with acceptable morbidity in patient with nasal obstruction and bleeding is a rare complication; while preservation of mucosa leads to early healing and absence of crusting and bone exposure. The microdebrider technique lends itself to precise tissue removal with satisfactory reduction of tissue, but also 5% developed synechia.

Lee *et al* ⁽⁷⁾ at 2004 during a study of 29 patients with microdebrider –assisted turbinoplasty found that the nasal obstruction improvement was 91%. Joniau *et al* ⁽⁸⁾ at 2006 performed their study on 19 patients. They did powered turbinoplasty on one side and sub mucosal diathermy on other side, and they found that powered turbinoplasty (microdebrider) was superior to sub mucosal diathermy. Hegazi *et al* ⁽⁹⁾ at 2007 observed that 10% of the patients developed mild crustation after microdebrider turbinoplasty and saw complete resolution of nasal obstruction in 80% of patients and mild nasal obstruction in 20% of patients two months after Microdebrider-Assisted turbinoplasty. Chen

et al ⁽¹⁰⁾ at 2007, during a study of 120 patients with chronic nasal obstruction, had divided them into 2 groups, one treated with microdebrider – assisted turbinoplasty and the other with sub mucosal resection. They had found that they are equally effective (both subjectively and objectively) in determining nasal obstruction in patients with hypertrophic inferior turbinate; however, microdebrider –assisted turbinoplasty was superior to sub mucosal resection due to more significant preservation of nasal mucosa resulting from definitive, controlled volume reduction of inferior turbinate sub mucosa.

Liu *et al* ⁽¹¹⁾ at 2009 noted that microdebrider turbinoplasty and related symptom such as nasal obstruction, sneezing, rhinorhea and snoring significantly decreased from 6 months to 3 years after surgery, and also observed crustation and adhesion in 7 patients of 60 patients. Cingi *et al* ⁽¹²⁾ at 2009 found that the nasal obstruction significantly improved after microdebrider – assisted turbinoplasty on seventh day and persist after 3 months from surgery. Finally, Bahandarkar *et al* ⁽¹³⁾ at 2010 found that microdebrider-assisted turbinoplasty is a trend toward procedures that are mucosal sparing and may offer better long term outcome than radiofrequency ablation.

In conclusion, microdebrider - assisted turbinoplasty is a safe method for achieving turbinate size reduction with acceptable morbidity in patients with nasal airway obstruction secondary to turbinate hypertrophy; with bleeding as a minimal complication. Preservation of mucosa leads to early healing and absence of crusting.

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