Research Paper

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Comparative Study Between Partial Inferior Turbinectomy and Submucosal Diathermy in the Management of Inferior Turbinate Hypertrophy

Medical Science

KEYWORDS : Hypertrophy of inferior turbinates, partial inferior turbinectomy, submucosal diathermy.

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ABSTRACT

Objective- Inferior turbinate hypertrophy leads to chronic nasal obstruction which causes significant morbidity. In our study, we aim to compare the efficacy of two popular surgical techniques in the treatment of hypertrophy of inferior turbinates, namely partial inferior turbinectomy and submucosal diathermy.

Methods - A prospective study involving 100 patients aged between 18-50yrs and who fulfilled the inclusion criteria was conducted. Patients were sequentially grouped into two groups of 50 patients each, partial inferior turbinectomy was performed on one group and submucosal diathermy on another. Subjective and objective assessments were made at 1 week, 1 month and 2 months post operatively.

Results- It was concluded in our study that early and better results were seen in patients who underwent partial inferior turbinectomy.

INTRODUCTION

The inferior turbinate is the main regulator of nasal airflow and thus of normal respiration.[1] Hypertrophy of the inferior turbinate thus leads to an exponential increase in airway resistance and is one of the major causes of chronic nasal obstruction.[2] Diagnosis of an enlarged inferior turbinate causing nasal obstruction is mainly by exclusion as there is no proper definition in terms of objective measurement.[1] More so the diagnosis is retrospective based on the effect of given treatment on impaired nasal patency.[1] Although chronic nasal obstruction is not life threatening, it can cause significant morbidity such as prolonged respiratory infection, secondary sinus involvement , decreased sense of smell and sleep disorders.[3]

Causes of hypertrophy of inferior turbinates are allergic rhinitis, vasomotor rhinitis, rhinitis medicamentosa, infectious chronic rhinosinusitis, some anti depressant drugs and pregnancy.[1] Most of these respond to medical line of treatment such as topical corticosteroids , antihistamines, antibiotics and immunotherapy.[2] Some patients become unresponsive to the medical treatment because of atonic submucosal venous sinusoids or submucosal fibrosis and in such cases surgery is indicated for symptomatic relief.[2] The principle of the surgery should be to decrease the patient's complaint while preserving the function and anatomy of the nasal air passage.[4] Although many surgical techniques have been developed such as turbinectomy, electrocautery, laser cautery , silver nitrate cautery , cryotherapy, submucosal resection with or without lateral displacement etc, there is lack of consensus about the effectiveness of these techniques.[2]

Partial inferior turbinectomy and submucosal diathermy are among the most popular surgical techniques. We in our study aim to prospectively compare the efficacy of these techniques in terms of degree of improvement of nasal obstruction and complications associated with both the procedures.

PATIENTS AND METHODS

A prospective study involving 100 patients aged between 18 to 50 years was conducted in the ENT department of Kempegowda Institute of Medical Sciences from 2011 to 2013

Patients with history of nasal obstruction due to hypertrophy of inferior turbinates because of allergic rhinitis, rhinitis medicamentosa, vasomotor rhinitis with or without mild DNS and who were unresponsive to the medical line of treatment were included in the study.

Exclusion criteria were history of nasal surgeries, nasal crusting, nasal polyps, gross septal deviation, chronic sinusitis, large middle turbinates, concha bullosa, obstruction in the postnasal space and any other major nasal diseases.

Patients were preoperatively assessed by a scoring system on the subjective feeling of nasal obstruction, diminished sense of smell and snoring. Objectively patients were assessed by anterior rhinoscopy and diagnostic nasal endoscopy to rule out other causes of nasal obstruction.

On anterior rhinoscopy, hypertrophy of inferior turbinate was graded in to 3 types- (4, 5)

Grade 1- mild enlargement with no obvious obstruction

Grade 2- moderate sized turbinate not touching the septum

Grade 3- large mulberry turbinates touching the septum and completely occluding the nasal cavity.

All grade 3 and some patients with grade 2 nasal obstruction were included in the study.

Patients were randomly divided into 2 groups of 50 patients each – Group A and Group B.

Submucosal diathermy was performed on Group A and partial inferior turbinectomy on Group B.

Surgical techniques- Surgeries were performed under general or local anaesthesia.

Submucosal diathermy- Abbey's diathermy needle was inserted into the anterior end of the inferior turbinate and advanced submucosally until the posterior end of the inferior turbinate was judged to have been reached. The needle was then withdrawn with current applied. Anterior nasal packing was done with ribbon gauze after soaking it in an antiseptic cream and was removed after 24 hrs.

Partial inferior turbinectomy – The inferior turbinate was infiltrated with 2% xylocaine with adrenaline up to the posterior end. Partial inferior turbinectomy was done using the turbinectomy scissors. The medial one-third of the anterior end of the inferior turbinate is resected without any trauma to the bony inferior concha. Posterior end of the inferior turbinate was removed with a special scissor which crushes and then cuts the tissue. Using suction cautery, posterior end of the inferior turbinate was cauterized. Bilateral anterior nasal packing done with ribbon gauze and it was removed after 48hrs.

Immediate postoperative assessments were made after 24 hours for submucosal diathermy and after 48 hours for partial inferior turbinectomy. This was followed by assessments made

after one week, one month and two months. Patients were asked to revisit for assessment if the symptoms recurred or if any other problem was encountered.

Patients were subjectively assessed by the same scoring system on the state of nasal breathing, improvement of olfactory acuity and disappearance of snoring.

Objectively assessments of post operative complications were made regarding reactionary haemorrhage, wound infection, nasal crusts, vestibular skin burn, nasal pain, inferior turbinate necrosis, synechiae and atrophic rhinitis.

DISCUSSION

Turbinates are thin, curved shell-like bones covered by ciliated respiratory mucosa and are attached to the lateral wall of the nose. They are three and occasionally four in number.[1]

The nasal valve is formed medially by the septum and laterally by the caudal end of the upper lateral cartilage and is the site of highest resistance to airflow (almost 50%).[6] The anterior tip of the inferior turbinate lies in this area and its physiological function is to help create the inspiratory resistance necessary for normal breathing by ensuring the negative intrathoracic pressure needed for inspiration.[1]Other physiological functions of the inferior turbinates include humidification, warming and cleansing of inspired air with mucociliary transport , cellular and humoral defences.

Swelling of the nasal mucosa is part of the normal process known as 'the nasal cycle'. Allergy and infection causes increase in the degree of the swelling and topical drugs such as steroids and vasoconstrictor change the rhythm of the cycle.[1] There is enlargement of the mucosa and/or bone of the inferior turbinate in these cases but what constitutes pathological or normal is not well defined. [1]Most often the diagnosis of bilateral hypertrophied inferior turbinates causing chronic nasal obstruction is made by exclusion or retrospectively based on the effect of treatment.[1]

Enlargement of the inferior turbinate due to engorgement of the submucosal venous sinusoids usually responds to medical treatment such as topical corticosteroids , antihistamines or immunotherapy.[6] If the submucosal venous sinusoids become atonic or there is submucosal fibrosis , there is no response to medical treatment and hence surgical intervention is warranted for relief.[6]

Surgical management of hypertrophied inferior turbinates have been debated for many years and the focus has been mainly on the technological advances than to establish benefit to the patient. The goal of any surgical treatment should be to improve nasal obstruction and to avoid short and long term complications.[1]

Our study aims to compare the efficacy and complications associated with the two more popular surgical techniques – partial inferior turbinectomy and submucosal diathermy.

Patients were assessed subjectively and objectively before and after the surgery. Anterior rhinoscopy and diagnostic nasal endoscopy was done. Rhinomannometry could not be done as it was not available at our institute.

It was observed in our study that partial inferior turbinectomy showed better and early results when compared to submucosal diathermy in terms of subjective improvement of symptoms. Patients who underwent partial inferior turbinectomy showed marked improvement of nasal obstruction at the end of first week itself with 80% of them having total improvement while the remaining 20% said that the nasal obstruction was reduced to being a mild problem. At the end of second month, 49 patients [98%] had no nasal obstruction while only one patient said that it remained as a mild problem ["Table 1about here"]. This is in contrast to the people who underwent submucosal diathermy wherein it was observed that even at the end of the second month only 82% of them showed total improvement whereas 6%, 10% and 2% of them maintained that the nasal obstruction remained as a mild, moderate and fairly bad problem respectively. This was in addition to a slow improvement of symptoms ["Table 2 about here"]. Similar results were observed with respect to improvement of other symptoms of poor sense of smell, snoring and sleep apnoea syndrome as well. Partial inferior turbinectomy results were much better in terms of early and total improvement of these symptoms. [Tables 1 and 2]. The results of our study were compared to some of the other studies and it was observed that the studies showed variable results. [" Table 3 about here"].

Among patients who underwent partial inferior turbinectomy, 2[4%] of them had reactionary haemorrhage, 4[8%] of them had wound infections and nasal crusting and 6[12%] of them had postoperative nasal pain. None of the patients who underwent submucosal diathermy had reactionary haemorrhage but 4[8%] of them developed nasal synechia, 8[16%] of them had nasal pain and 5[10%] of them had vestibular skin burn. None of the patients had nasolacrimal duct injury or developed atrophic rhinitis. Nasal crusting, nasal synechia and wound infections can be avoided by educating the patients to do proper nasal douching. Reactionary haemorrhage which was seen in only 2 patients post partial inferior turbinectomy was easily managed by repacking .["Table 4 about here"]

All our patients were followed up for a minimum period of 2 months but it was observed that many patients who underwent submucosal diathermy kept revisiting for recurrence of symptoms. So in conclusion it can be said that early and better relief of nasal symptoms associated with hypertrophy of inferior turbinate can be seen with partial inferior turbinectomy than with submucosal diathermy.

Table 1- Partial inferior turbinectomy evaluation

Symptoms	Score	Pre Operative assessment	Post Operative assessment			
			Day 2	1 wk	1 mth	2 mth
Nasal obstruction	1		34	40	48	49
	2		8	10	2	1
	3		8			
	4					
	5	50				
Poor sense of smell	1	28	44	46	50	50
	2	0	6	4		
	3	0				
	4	5				
	5	17				
Snoring/Sleep Apnoea Syndrome	1			42	46	46
	2			6	2	2
	3	0		2	2	2
	4	14				
	5	36				

Table 2- Submucosal diathermy evaluation

Symptoms	Score	Pre Operative assessment	Post Operative assessment			
			Day 1	1 wk	1 mth	2 mth
Nasal obstruction	1		1	5	25	41
	2		10	14	15	3
	3		37	29	9	5
	4	5	2	2	1	1
	5	45				

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Poor sense of smell	1	30	32	45	48	49
	2		4	4	1	1
	3	1	14	1	1	
	4	4				
	5	15				
Snoring/Sleep Apnoea Syndrome	1			15	34	40
	2			14	9	4
	3	2		6	2	3
	4	8		15	5	3
	5	40				

Score 1- not a problem
Score 2- very mild problem
Score 3- moderate problem
Score 4- fairly bad problem
Score 5- severe problem

Table 3- Studies showing improvement of nasal obstruction in patients who underwent partial inferior turbinectomy and submucosal diathermy.

PARTIAL INFERIOR TURBINECTOMY STUDIES	
STUDY	RESULTS
1. Mohammad Hassan Al-Baldawi 2009(Iraq)(4)	97.5%
2. Barbosa Ade et al 2005(Brazil)(9)	98%
3. Fradis et al 2000(USA)(3)	96%
4. Rakover and Rosen 1996 (USA)(10)	77%
5. Serrano 1996 (France)(11)	81.7%
6. Elwany & Harrison 1990 (Egypt)(12)	77%
7. Pollock & Rohrich 1984 (USA)(13)	90%
8. Our study	98%
STUDY	RESULTS
1. Mohammad Hassan Al-Baldawi 2009(Iraq)(4)	82.5%
2. Luczaj 2007(Poland)(7)	98%
3. Fradis et al 2000(USA) (3)	76%
4. Warwick-Brown 1987(UK)(8)	60%
5. Our study	82%

Table 4- Complications associated with the procedure

Post operative complications	Submucosal Diathermy	Partial Inferior Turbinectomy
Reactionary haemorrhage	-	2[4%]
Wound infection	4[8%]	4[8%]
Nasal crusts	4[8%]	4[8%]
Vestibular skin burn	5[10%]	-
Nasal pain	8[16%]	6[12%]
Synechia	4[8%]	-
Atrophic rhinitis	-	-
Nasolacrimal duct injury	-	-

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