Journal of Otorhinolaryngology Head and Neck Surgery

Research Article

Inferior Turbinate Reduction by Simple and Non-Expensive Technique

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Abstract

Chronic nasal obstruction is one of the most common symptoms in the practice of Otolaryngology. Our study was to evaluate the value of the reduction of both the bone and soft tissue of the inferior turbinate by using suction cautery and through-cutting Blaksley in 30 patients with bilateral inferior turbinate hypertrophy. They were 18 males and 12 females. The age ranged between 16-55 years. All cases were performed at ORL Department, in our tertiary hospital in the period from 2016-2018. Subjective and objective evaluations were done preoperatively and 6 months postoperatively. Subjective evaluation was done by questionnaires regarding nasal symptoms with score calculation. Objective evaluations were done by clinical examination, endoscopic evaluation, and CT scanning. Turbinate were graded into 0, I, II. Turbinate in grade I and II were included in the study. The preoperative mean of total symptom score was (5.00 ± 3.50) and postoperative was (2.50 ± 2.50). Preoperatively most of turbinates were in grade II but after surgery most of them were in grade 0. All turbinates were decreased in size after the procedure. So, by this technique patients showed both subjecive and objective improvement.

Keywords: Turbinate hypertrophy; Nasal obstruction; Turbinoplasty; Suction cauterization

Introduction

Enlargement of turbinates is the second most frequent cause of obstructions to nasal breathing after deviated nasal septum. Concha nasalis inferior is the largest of all turbinates. The inferior turbinate is the largest turbinate, and is responsible for the majority of airflow direction, humidification, heating, and filtering of air inhaled through the nose. Turbinates are composed of a pseudostratified columnar ciliated respiratory epithelium with a thick, vascular and erectile glandular tissue layer [1]. Anatomically the turbinate is divided into attached anterior and middle parts with free posterior end. It is composed of hard and soft components. The hard part is a bony like shelf (Os turbinale) and the soft part is the mucosa and submucosal tissues which contains extensive plexus of venous capacity vessels. Turbinates can be enlarged as a result of physiological, pathophysiological or anatomical reasons. Nasal obstruction may be temporary, intermittent or permanent. Nasal obstruction especially chronic permanent type interferes with normal personal as well as social activities thus considerably affect quality of life [2]. Allergic and vasomotor rhinitis is commonly associated with turbinate hypertrophy. Deviated nasal septum is without doughtiness associated with turbinate enlargement in the form of expansion to fill the wide space in one side of nasal cavity. Abuse of decongestant topical drops has been evidenced to cause irreversible turbinate hypertrophy. In the course of chronic rhinitis, the inferior turbinate is the main site for nasal obstruction because it contains extensive sinusoidal erectile tissue [3]. Medications prescribed for these disorders include antihistamines, sympathomimetics, anticholinergics, and steroids. These medications provide temporary rather than complete relief. Surgical interference remains the longstanding solution for nasal obstruction due to turbinate enlargement. Many techniques have been developed with the aim at reducing the volume of soft tissue with or without resecting the underneath bony part of the turbinate. Turbinate Reducing Procedures (TRP) is turbinectomy, laser cautery, electrocautary, cryotherapy, coblation and microdebrider. The choice of a particular procedure is largely based on the available facilities and the tools in hand of surgeon. In the present study the soft and hard components of the inferior turbinate were reduced by suction cauterization, Bleksely forceps and through cutting forceps. The effectiveness of this simple technique was studied in alleviating nasal obstruction both subjectively and objectively.

Patients and Methods

A prospective study was performed including patients with symptoms and signs of nasal obstruction related to enlarged inferior turbinate whom were treated from March 2016 to April 2018 at our general hospital. This study included 30 patients with chronic nasal obstruction due to bilateral inferior turbinate hypertrophy with unresponsiveness to medical treatment. They were 18 males and 12 females with age range of 16-55 years. All patients were subjected to preoperative clinical history, full otorhinological examination. The pathology responsible for nasal obstruction. Inclusion criteria consisted of bilateral enlarged inferior turbinates as the only cause of nasal obstruction. All cases were evaluated by anterior rhinoscopy, nasal endoscopy as well as CT scanning, preoperatively and 6 months after surgery. We graded inferior turbinate from 0 to II according to degree of nasal obstruction. Grade 0 turbinate was in patients with no nasal obstruction. Grade I turbinate was with partial nasal occlusion and Grade II was in patients with complete nasal occlusion. Grade 0 was excluded from the study. Subjective evaluation was done by a scale of 3 values with 0-6 points. The points in the scale had been

Citation: Mokbel KM. Inferior Turbinate Reduction by Simple and Non-Expensive Technique. J Otorhinolaryngol Head Neck Surg. 2020;1(1):1002.

Publisher Name: Medtext Publications LLC

Manuscript compiled: May 18th, 2020

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collected before surgery and 6 months after. The three values in the scale were; day nasal obstruction (1 point), night nasal obstruction (2 points), day and night nasal obstruction (3 points). A total symptom score was obtained by adding the points of the three values.

Surgical Technique

Consents were taken from patients enrolled in this study as well as institutional Ethics committee approval was taken. All cases were performed under general anesthesia. The inferior turbinate was injected with 1% lidocaine and adrenaline (1/100,000) in a submucosal plane. The mucosa and submucosa of the inferior and medial surfaces of the inferior turbinate were removed by using a monopolar suction electrocautery till exposure of the bony turbinate. Then the bone of the turbinate was removed by dissector, scissors, forceps and through cutting forceps. The superior mucosal wall of the turbinate was left intact and has been spread laterally on the denuded area. Merocel sponge packing (Smith and Nephew, USA) was applied for 3 days. Then alkaline nasal wash for 2 weeks to prevent crusting.

Results

A total of 30 patients presented with chronic bilateral nasal obstruction with unsatisfactory response to prolonged courses of medical treatment were included in this study. They were 18 males and 12 females with age ranged between (16-55 years with mean 30.50 ± 12.71). All patients had bilateral nasal obstruction. Clinically and endoscopically all patients had inferior turbinate in grade I and grade II. Minimum follow up period was 6 months with a range between 6 to 18 months. Table 1 shows the number, mean age, and the sex. The mean and standard deviation of each and total symptom scores gathered from questionnaires to all patients were summarized in Table 2. The preoperative mean of total symptom scores was (7.90 ± 5.50) and the postoperative was (1.50 ± 1.70) with high significant improvement (P value<0.05). Table 3 summarizes the objective data collected clinically, endoscopically and radiologically. The number of turbinates undergone surgical reduction was 60 turbinates. These turbinates were 24 in grade I (8 right sided and 14 left sided) and 36 in grade II (20 right side and 16 left sided). After surgery all turbinates were in grade 0. Minimal crustations were observed in all cases which improved by alkaline washing for 2 weeks postoperatively. No cases with adhesions were recorded. No bleeding was observed after pack removal or during the follow up period (Table 4).

Table 1: Demographic data.

Mean age	Female	Male	Number
30.50 ± 12.71	12	18	30

Tabe 2: Pre and postoperative mean and standard deviation of symptom scores.

	Preoperative		Postoperative	
	Mean	SD	Mean	SD
Nasal obstruction during day	1.62	1.51	0.26	0.26
Nasal obstruction during night	1.48	1.49	0.26	0.26
Nasal discharge during day	1.16	1.12	0.57	0.58
Nasal discharge during night	1.12	1.11	0.5	0.5
Hyposmia	1.47	1.36	0	0
Total	6.85	6.59	1.59	1.6

SD: Standard Deviation; P value was significant in all items (P<0.05)

Table 3: Pre and postoperative grades of inferior turbinates on right and left sides.

	Preoperative		Postoperative	
	Right	Left	Right	Left
Grade 0	0	0	24	36
Grade I	8	20	0	0
Grade II	16	16	0	0

Table 4: Postoperative complications.

	Number of cases
Bleeding	0
Crustation	60
Foul odor	0
Synechia	0

Discussion

Inferior turbinate is the longest and biggest turbinate so it takes a big volume of nasal air space enlargement of inferior turbinate leads to compromise air flow in the nose that manifests in the form of different degrees of nasal obstruction which may be partial or complete. Nasal block sensation off course affects worse on nasal symptoms and personal activities [4]. Total and near total turbinectomy operations are considered aggressive approaches to widely open the nasal airflow, it becomes widely not recommended by many surgeons owing to their postoperative complications including excessive crustations, dryness, epistaxis and bad odor of breath due to atrophic rhinitis [5,6]. The concept of preservation of nasal mucosa is important to keep normal physiological function of the nose.

Otolaryngologists began to shy away from total or near total turbinate resections due to excessive bleeding, prolonged postoperative crusting and the fear of atrophic rhinitis, a dreaded complication. The new concepts is to reduce the bulk of inferior turbinate with no or minimal handling of surface mucosa to avoid its injury. The reduction of inferior turbinate is recently achieved by submucosal bone resection by microdebrider, electric drill or by Bleksely forceps. Submucosal soft tissue reduction could be achieved by monopolar, bipolar diathermies or Coblation [7]. Some authors compared the CO2 laser with Nd: YAG laser in the treatment of hyperplasic inferior turbinates and mentioned postoperative bleeding rates up to 16% and marked crusting up to 52% [8]. Authors [9] reported the rate of complications in different techniques of inferior turbinate reduction (turbinectomy, laser cautery, electrocautery, cryotherapy, submucosal resection, and submucosal resection with lateral displacement). Recent procedures need more modern equipment which make the surgery be more expensive sometimes not available in many hospitals and clinics. I had taken this concept in our mind and practiced very simple and effective turbinate reduction technique. Turbinate reduction in the present study was practiced by simple instruments commonly in hand of most of otolaryngologists without engagement of expensive equipment making the procedure more costly. We used suction diathermy for trimming of inferior and medial turbinate soft tissue. I used the Bleksely forceps to trim the underlying turbinate bone. In our technique we preserved the mucosa of the superior and lateral wall of turbinate in order to improve the chances for continued function of the inferior turbinate. Our patients have significant symptomatic relief and objectively all inferior turbinate showed marked reduction in their sizes. Reduction of bone creates more space together with more than half of the covering mucosa minimize the engorgement of the inferior turbinate [10]. Postoperative bleeding is a complication associated with all turbinate reduction techniques [11,12]. In our study, the incidence of postoperative bleeding was 0%, synechiae 0%, foul odor 0%, and atrophy 0%. Minimal crustations nearly in all cases but could be effectively treated by alkaline washings with complete absence after 2 weeks.

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