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Clinical benefits of surgical management of concha bullosa

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ABSTRACT

Background: Concha bullosa is a common anatomical variation in nasal cavity, responsible for headache, Rhinogenic origin is an important cause for headache wrongly managed now a day, which may be treated by medical or surgical intervention, proper diagnosis and patient's selection is very important to achieve good results with surgery of CB. The aim of this study is to evaluate the efficacy and assess the clinical benefits outcome results of our endoscopic turbinoplasty technique for CB.
Methods: This study was done in SMHS GMC Srinagar for a period of one year and about 30 patients with mild/moderate DNS and associated CB with symptoms of facial pain, head ache, nasal obstruction, anosmia, recurrent rhinitis were selected for surgical management and symptoms assessment was done using VAS.
Results: The 30 patient group with 1: 1 male: female ratio predominatly in 3rd decade of life presented with nasal obstruction more on concha bullosa side, 26 with facial pain and 27 patients with head ache and nasal obstruction, anosmia/hyposmia in 20 and recurrent rhinitis in 26. There was statistical significant benefit on symptoms score in patients managed with endoscopic chonchoplasty.
Conclusions: The endoscopic turbinoplasty is safe and efficacious procedure for concha bullosa and is causuative factor for rhinogenic origin of headache and facial pain.

Keywords: Concha bullosa, Endoscopic turbinoplasty, Rhinogenic headache

INTRODUCTION

Concha bullosa (CB) is the pneumatization of the middle turbinate and is one of the most common variations of the sinonasal anatomy. A 14%-53.6% frequency of concha bullosa was reported by various studies[1]. The most common type of the CB is middle turbinate pneumatization; however, superior and inferior turbinate pneumatizations have also been rarely reported. Pneumatization (CB) or hypertrophy of the middle turbinate can result in its contact with the septum or the lateral nasal wall and may cause headaches or facial pain, in the 74% of the patients, contact point headaches has been seen in periorbital region. As reported in the classical work of Wolff (1948), the middle turbinate and the nasal septum is innervated by an anterior ethmoidal nerve, a branch of the ophthalmic division of the trigeminal nerve; stimulation of these regions causes pain in the medial canthus of the supraorbital region.[1] Periorbital pain may be due to middle turbinate compression against the septum or the lateral wall of the nose, and it leads to the congestion of the nasal mucosa or pneumatization of the middle turbinate. The proper diagnosis and patient's selection is very important to achieve good results with management of CB and diagnosis of middle turbinate headache syndrome is made by exclusion and requires a high index of suspicion, anterior rhinoscopy, computerized tomography (CT), and confirmation by the lidocaine test.[2] Rhinogenic headaches may be treated by surgical or medical interventions.

Corticosteroid spray and decongestants are used in medical treatment. The treatment is by relieving the contact point by surgical or medical options.

METHODS

A prospective study was done in SMHS GMC Srinagar, ENT department from June 2016 to May 2017. Total of thirty patients were included in this study, The endoscopic examination showing the presence of mucosal contact areas related to enlarged middle turbinate (concha bullosa on CT) in contact with septum medially or in contact with lateral nasal wall. All of them were sent for non-contrast CT scan of nose and paranasal sinuses coronal cuts (Figure 1).

Inclusion criteria

Inclusion criteria were patients with CT documented concha bullosa unilateral/bilateral without gross DNS; normal ophthalmologic, neurologic and systemic examinations, despite the presence of the headaches; patients with symptoms of nasal obstruction, headache, facial pain, recurrent rhinitis and anosmia/hyposmia.

Exclusion criteria

Exclusion criteria were patients with obstructive DNS, bony spurs; patients with prior history of nasal trauma; patients with allergic rhino sinusitis; previous sinonasal surgery.

Visaual analog scale was used for assessing symptoms scoring of facial pain, headache, nasal obstruction, anosmia/hyposmia and rhinitis both pre and postoperatively. All the patients underwent surgery (endoscopic lateral partial turbinoplasty) under general/local anesthesia. Patients were followed up for 4 months postoperatively. Endoscopic surgical opening of concha bullosa performed for all patients. Concentrating on removal or release of contact points. All patients were followed for about 4month postoperatively, initially every week for about 1 month then every month for 4 month period. VAS score was repeated 4 month postoperatively.

RESULTS

In our study (50%) were female and (50%) were male with 1:1 ratio, and the third decade was the most common age group with mean age 37 yrs (Table 1). The symptoms distribution was seen as facial pain in 86% of study group headache mostly periorbital and nasal obstruction in 90% of patients, anosmia in 67% and recurrent rhinitis in 86% of study group patients. In this study more than 90% patients had complete relief of all the major symptoms facial pain, headache, nasal obstruction, anosmia and recurrent rhinitis with only 2 patients (10%) who complaint of no improvement in symptoms postoperatively. So in our study we have 28 (93%) patients responded to surgery but only 2 patients with poor response (7%) (Table 2). The improvement in mean VAS of preoperative and postoperative symptoms was statistically highly significant as the p value was 0.000 calculated by SPSS software (Table 3).

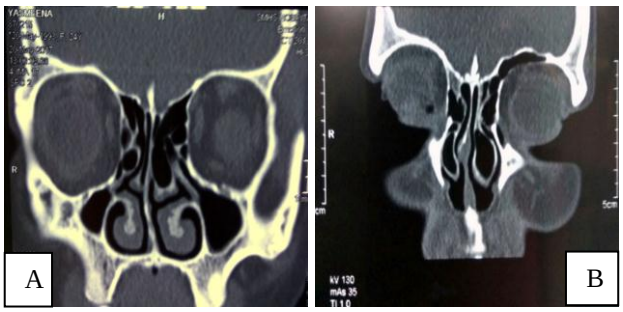

Figure 1: (A) Unilaterl, (B) Bilateral CB in CT.

Table 1: Age group distribution of study group.

Age group	Number
0-10	0
11-20	7
21-30	2
31-40	9
41-50	5
51-60	6
61-70	1

Table 2: Demonstration of preoperative and postoperative symptoms relief.

Symptoms	Preoperative symptoms n (%)	Postoperative symptoms improvement		
		Complete relief	Partial relief	No relief
Facial pain	86 (26)	18	6	2
Headache	90 (27)	19	6	2
Nasal obstruction	90 (27)	20	5	2
Recurrent rhinitis	86 (26)	17	7	2
Anosmia/hyposmia	67 (20)	10	8	2

Table 3: Showing preoperative and postoperative symptoms score change on basis of VAS.

Symptoms	Preoperative VAS	Postoperative VAS	Mean±SD	P value
Facial pain	6.7	3.4	3.300±1.8	0.000
Headache	7.1	3.5	3.700±1.6	0.000
Nasal obstruction	7.0	3.0	3.933±1.7	0.000
Recurrent rhinitis	6.0	3.5	2.500±2.1	0.000
Anosmia/hyposmia	6.3	3.8	2.467±1.9	0.000

DISCUSSION

Concha bullosa (CB) is the pneumatization of the middle turbinate and is one of the most common variations of the sinonasal anatomy. A 14%-53.6% frequency of concha bullosa was reported by various studies.[1] Bolger et al have classified pneumatization of the concha based on the location as lamellar concha bullosa (LCB), bulbous concha bullosa (BCB) and extensive concha bullosa (ECB) (partial or total pneumatization of the middle turbinate is called concha bullosa but there is no significant relationship between the CB types and the sinus disease.[3] Calhoun et al have found that population with symptoms of sinus disease have significantly greater incidence of concha bullosa.[4] Lloyd in his study of 100 patients has shown that concha bullosa was associated with presence of increased infection in the sinuses.[5] It has been observed that the pneumatized middle turbinate plays an important role in the pathogens of sinusitis and nasal obstruction. In our study 26 out of 30 patients (86%) were documented as having chronic rhino sinusitis in association with unilateral or bilateral choncha bullosa. A less frequent symptom was that of concomitant nasal obstruction seen in 27 of 30 patients. The improvement postoperative seen was also statistically significant.

In a retrospective review study by Parsons, conducted on 15 children (6 to 15 years) and 19 adults (28 to 63 years) who were treated with surgical intervention, the causes of the headaches were large middle concha, large uncinate process, nasal spur, and double middle turbinate.[6] The surgical intervention done was directive endoscopic procedure on the lesion. The severity of pain was measured by questioner method. In the study of Mohebbi et al on 36 patients with chronic headaches who had not previously responded to conventional treatments, the intensity of the headaches, pre- and post-operatively, were compared by utilizing the VAS.[7] The overall success rate approximated 83% after surgery. Also, Mariotti et al revealed that, endoscopic sinus surgery in rhinogenic headache was widely successful on their patients, and 28 (84.8%) of 33 patients had reported an improvement.[8] As an important difference with the others, in this study, the characteristics of the headaches were evaluated by an examiner, who was unaware of the patients' treatment plans. Some patients with refractory headaches and endonasal contact areas benefit from the surgery, thereby supporting an existence of a correlation between the two entities. Even though it is clear that surgery should be considered only if all other treatments have failed, a success rate of 65% over almost 10 years justifies an importance of this option. In our study of 30 patients' facial pain and headache more around periorbital region was considered separately with CT documentation of choncho bullosa on same site of pain and symptoms scores were analysed likewise with VAS significant change in score was seen postoperatively. Although in present study, the headache/facial pain severity has been analyzed by the VAS, the studied groups and the study design was different.

Havas and Lowinger have shown slight smell outcome benefit in their middle turbinate resection group and no iatrogenic hyposmia.[9] As for our study accurately commenting on any benefit as far smell is concerned is no sincere since we did not measure smell quantitatively but none of our cases had worsening of symptoms of smell postoperatively. In our study 18 out of 20 patients who had complaints of anosmia/hyposmis had significant improvement post operatively.

Different techniques have been described for management of concha bullosa. These range from radical excision of middle turbinate to minimal excision of medial or lateral lamella, or crushing of the concha. Cannon et al in his study has favored lateral excision of the middle turbinate.[10] Braun and Stammberger preferred lateral lamella removal rather than excision of medial lamella or crushing of concha bullosa.[11] We have adopted Stammberger's technique of endoscopic lateral lamella removal in all our patients. This procedure is straight forward, can be carried concomitantly with septal or FESS procedures, and has been observed free of any significant complications.[13] Specifically, no instances of synechial formation have occurred between the raw surface of the turbinate and the septal or sinus site.

CONCLUSION

The endoscopic turbinoplasty is safe and efficacious procedure for concha bullosa as it preserves middle turbinate anatomically and physiologically and treats the concha with negligible complications. Concha bullosa has proven causuative factor for rhinogenic origin of headache and facial pain. Rhinogenic headache and migraine are frequently confused with each other. Considerable research and bigger clinical studies are needed to further understand the role of the nasal pathology in rhinogenic headaches and facial pains.

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