

**Original article:**

## **A prospective study of clinical presentation and surgical outcomes in patients of concha bullosa**

**\*Roy C.A<sup>1</sup>, Chauhan N.V<sup>2</sup>, Telang R.A<sup>3</sup>, George A. A<sup>4</sup>, Gupta H<sup>5</sup>, Shah J. A<sup>6</sup>, Mistry P R<sup>7</sup>, Burgute.S<sup>8</sup>**

<sup>1</sup>Lecturer ,Dept. of ENT, B.J.M.C Medical college,Pune2

<sup>2</sup> Assoc.Prof., SumandeepVidyapeeth,Gujarat.

<sup>3</sup> Prof and Head, Dept. of ENT ,SumandeepVidyapeeth ,Vadodara,Gujarat.

<sup>4</sup>Assoc Prof.Dept. of ENT,BJMC,Pune.

<sup>5</sup>AssistantProfessor,Dept.of ENT,BJMC,Pune,

<sup>6</sup>SeniorRegistrar,Sumandeepvidyapeeth,Gujarat.

<sup>7</sup> SeniorRegistrar,SumandeepVidyapeeth , Vadodara ,Gujarat.

<sup>8</sup> Senior resident .Dept.ofENT,BJMC,Pune.

Corresponding author\*

---

### **ABSTRACT:**

**Background:** Pneumatisation of middle turbinate and less commonly the superior turbinate is called concha bullosa. Concha bullosa can cause nasal obstruction, post nasal drip,contact point headache,sinusitis, and osteomeatal disease. There are many surgical techniques to treat concha bullosalike crushing, partial turbinectomy,lateral partial turbinectomy and conchoplasty. In these techniques there are chances of recurrence, destabilisation of turbinate, synechia formation and olfactory disturbance. Conchoplasty is a technically demanding procedure but gives good results and has rare complications.

**Material and method:** Fiftyeight patients who were diagnosed with concha bullosa on CT scan and underwent conchoplasty were included in the study. All patients with subjected to conchoplasty under local or general anaesthesia and were observed upto 1 year.

**Results:** Follow up of 1 year showed fruitful results in improvement of symptoms and signs suggesting excellent outcome of surgery.

**Conclusion:** Conchoplasty can be an effective surgery in treatment of concha bullosa.

**Keywords:** concha bullosa, conchoplasty, endoscopic sinus surgery

---

### **INTRODUCTION**

Pneumatisation of middle turbinate and less commonly the superior turbinate is called concha bullosa <sup>(1)</sup>. It is the commonest anatomical variation of lateral wall of nose. There are many studies which link the presence of concha bullosa to higher incidence of nasal obstruction, post nasal drip,contact point headache ,sinusitis, osteomeatal complex block<sup>(2)</sup>. Concha bullosa can be considered pathogenic by two methods, first, it may directly or by pushing the uncinate process laterally, block the

drainage of the anterior ethmoid, frontal or maxillary sinus.Second, bulbous enlargement of the middle turbinate may increase the likelihood of mucosal contact between the turbinate and lateral structures. This may lead to dysfunction of mucociliary clearance mechanism and to the release of neuropeptides that cause local inflammation. Concha bullosa can be treated surgically during functional endoscopic sinus surgery (FESS).

Many surgical techniques are described in literature for the treatment of concha bullosa. It includes the methods like crushing, partial turbinectomy, lateral partial turbinectomy and conchoplasty. Crushing the turbinate may be sufficient to relieve nasal obstruction. Resection is especially suited for concha that are pneumatised anteriorly. In lateral partial turbinectomy, the lateral bony lamella along with mucosa is excised. In these three techniques there are chances of recurrence, destabilisation of the turbinate, synechia formation and olfactory disturbances<sup>(4)</sup>. In conchoplasty, the bony lamella is removed but the mucosa is repositioned, it is a technically demanding procedure but gives good results and minor complications.

**Material and method:** This study was done over a period of 4 years July 2011 to August 2015.

**Inclusion criteria:**-1) Patient with complaints of nasal obstruction, headache, post nasal discharge and having concha bullosa on CT scan of paranasal sinuses and who underwent surgery with a minimum follow up of 1 year.

**Exclusion criteria:**-Patients with history of previous nasal, paranasal sinus surgery.

According to these criteria, 58 patients were selected. A thorough clinical examination including anterior rhinoscopy and diagnostic nasal endoscopy was done. If patient complained of headache at the time of presentation, a xylocaine test was performed to see if this aborts the headache. A

cotton wool probe soaked in Xylocain 2% or 4% was inserted between the concha bullosa and lateral nasal wall, where they touch one another. The pain disappeared in 9 out of 10 patients. Pneumatization of middle turbinate was classified depending on the pneumatisation of the lamellar part and bulbous portion of middle concha as lamellar and bulbous respectively. Pneumatisation of both lamellar and bulbous part was classified as extensive type. If concha bullosa was present it was graded in size as small, moderate or large. If bilateral concha bullosa was present, sizes were compared and the larger one was identified as dominant. CT scan of nasal cavity was done by Siemens Somatome Emotion DR 3 scanner with version E software. Scanning parameters included 3mm thickness, 5 s scan time 125 kVp and 450 mAs. After due work up patients were operated after taking proper consent. Surgery used for concha bullosa was conchoplasty.

**Surgical technique:-**

1) Routine preparation : After routine preoperative work-up, under general anaesthesia, nasal mucosa was decongested with cotton pledgets soaked in 4% xylocain and 1:1000 adrenalin were placed in middle meatus for 10 minutes. Under endoscopic guidance, 0.5 ml of 2% xylocain with adrenalin was injected submucosally in the anterior and inferior surface of the pneumatised middle turbinate.

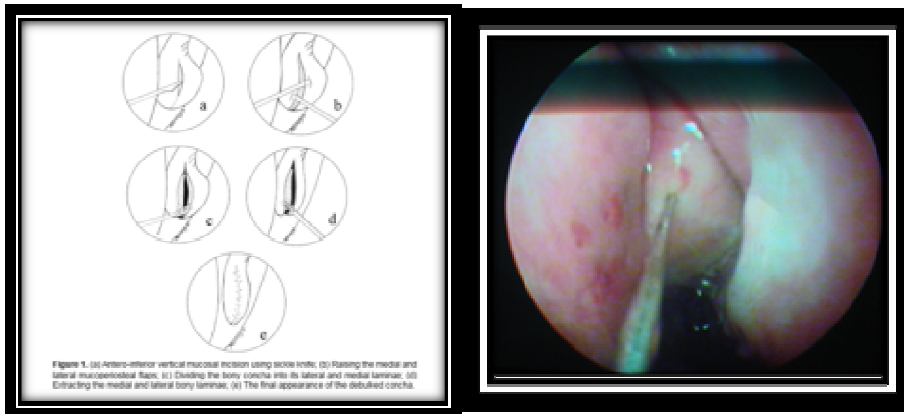


Fig .1 Schematic diagram

Fig 2. Sub-mucosal infiltration

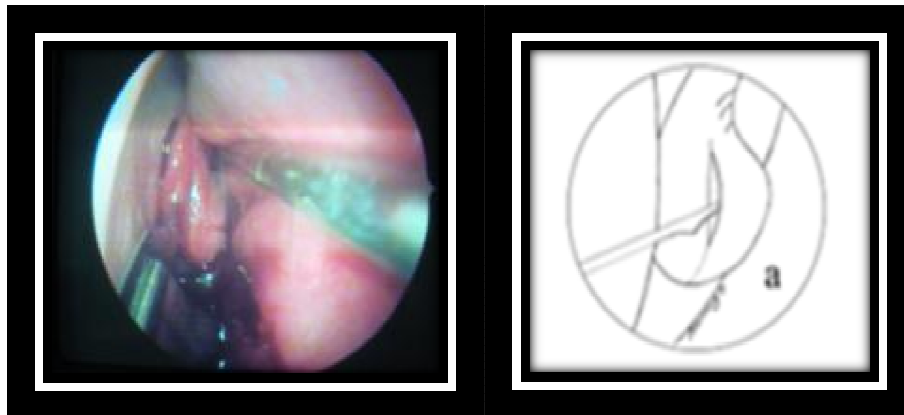


Fig.3 Mucosal incision taken

2) Creating a mucoperiosteal flaps: A sickle was used to make a vertical incision into the anterior surface of the concha bullosa and extended along the inferior surface. Using a dissector, a plane is created between the bony wall of concha and medial and lateral mucoperiosteal surfaces which creates medial and lateral mucosal flaps.

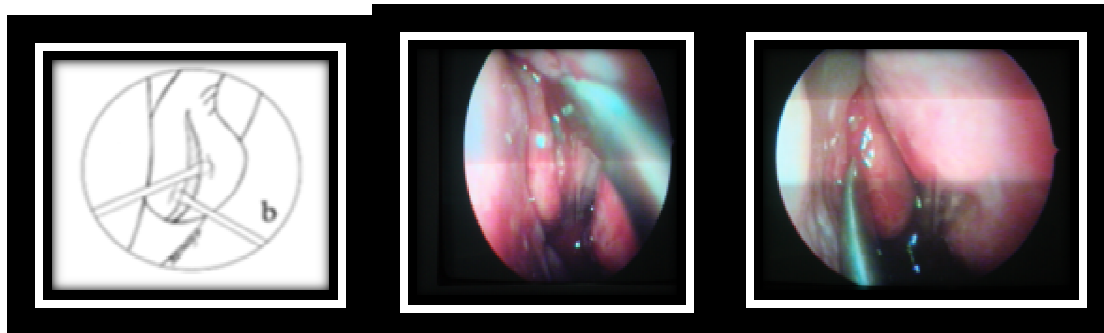


Fig.4.Raising medial and lateral mucoperiosteal flap

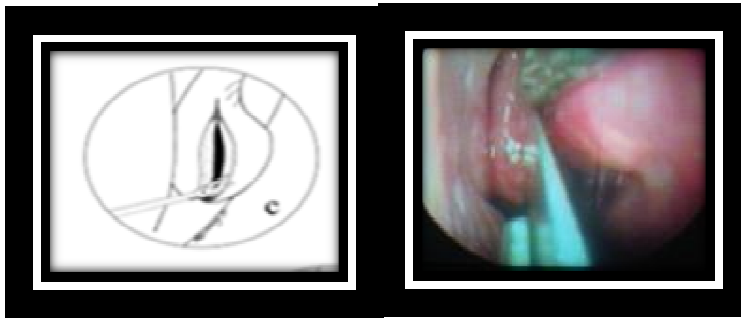


Fig. 5 Dividing bony concha with straight scissors

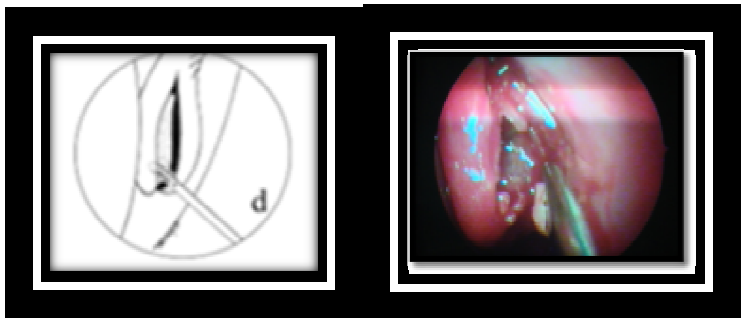


Fig. 6 Extracting lateral lamella with Blakesly forceps

3) Evacuation of concha bullosa: A straight sharp scissor is used to divide bony concha into lateral and medial lamellae anteriorly and inferiorly. The covering mucosal flaps were then sequentially raised and the bony medial and lateral lamellae removed using Blakesly forceps.



Fig. 7 Final appearance of debulked concha

4) Flap repositioning: Both medial and lateral mucoperiosteal flaps were laid over the raw surfaces closing the evacuated conchal cavity. Gelfoam is then placed in the middle meatus and nasal cavity to hold the flaps in place.

Postoperative care: Injectable or oral antibiotics and decongestants were given for a period of 7 days. The cavity was packed with merocel for 48 hours after surgery. Patients were started with alkaline nasal douching after pack removal. This was followed with saline nasal drops. Follow up was done biweekly for first month followed by every month for at least 1 year. At each follow up,

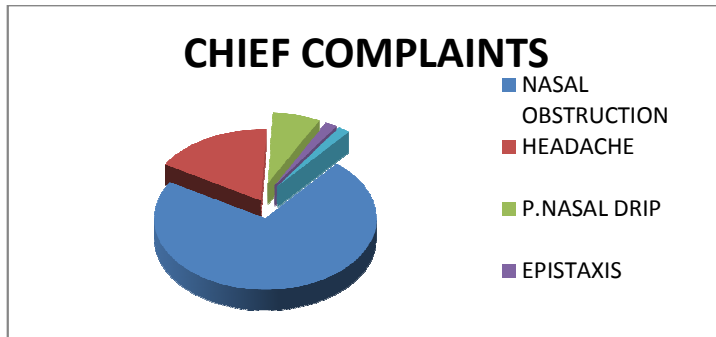
history of the patient was reviewed regarding improvement or resolution of symptoms. Nasal endoscopy was done at each follow up.

**Results:** A total of 58 patients were included in the study. There were 36(62%) males and 22(38%) females. The male to female ratio is 1.6: 1. Thus showing slight male preponderance. The commonest age group was 21-30 years which had

24 (41%) patients, followed by 20(34%) patients which were in the age group of 31-40 years. 10 patients (17%) were in the age group of 41-50 years. The least common age groups were 11-20 years and 51-60 years which had 2 (3.4%) patients each respectively.

The youngest patient was 19 years and the oldest was 57 years of age. In the present study of 58

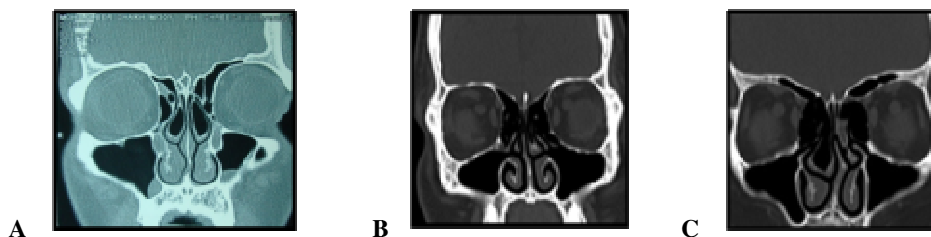
cases, the commonest presenting symptom was nasal obstruction that was seen in 42(72.4%) patients. This was followed by headache, seen in 10 (17.2%) patients. Post nasal discharge was seen in 4 (6.8%) patients. 1 patient(1.7%) had complaint of epistaxis and 1(1.7%) patient had complaint of facial pain.



**Fig.8) Chief Complaints**

On, CT scan of 58 patients, 25(43.1%) had unilateral concha bullosa, 33 (56.9%) had bilateral concha bullosa. A total of 91 conchae bullosa were detected. Of the 25 unilateral concha bullosa, 15(60%) were on the right and 10(40%) on the left. In 33 patients with bilateral concha

bullosa 14(42.42%) were left dominant and 19(57.57%) were right dominant. 10(18.18%) patients had lamellar type, 27(46.55%) had bulbous type and 21(36.2%) had extensive type of concha bullosa.



**Fig.A) Bilateral bulbous concha bullosa.**

**Fig.B) Lamellar concha bullosa with left dominant concha.**

**Fig.C) Right extensive concha bullosa.**

Symptoms				
Symptoms	1 week	4 weeks	6 months	1 year
Nasal obstruction	20 (66.6%)	11 (36.6%)	Nil	Nil
Headache	9 (30%)	2 (6.6%)	Nil	Nil
Nasal discharge	2 (6.6%)	1 (3.3%)	Nil	Nil
Epistaxis	Nil	Nil	Nil	Nil
Facial pain	Nil	Nil	Nil	Nil

**Fig.9 Showing Post operative symptoms**

**Discussion:**

The anatomy of lateral wall of the nose became more evident due to computerised tomography .Concha bullosa gained importance as a common cause of osteomeatal complex block responsible for chronic headache, nasal obstruction,post nasal discharge which can be treated satisfactorily with surgery.

In the present study of 58 cases there were 36(62%) males and 22(38%) females, the male to female ratio being 1.6:1 suggesting a slight male preponderance. Our observations are consistent with the study of Bhandari et al (5) which had 97(57.3%) males and 72(42.6%) females with male to female ratio of 1.5:1. Albhirmay et al (4) had also done similar study which had 18(60%) males and 12(40%) females, the male to female ratio being 1.5:1. However this study was conducted in pediatric age group (9to 16 years).The male preponderance in these studies is probably due to male dominance in the society.Female preponderance was reported by Hatipoglu et al (2) there were 29(42.6%) males and 39(57.3) females, the male to female ratio being 0.74:1.

YarmohammadiME(3) et also did a similar study which had 9(40.9%) males and 13(59.1%) females, the male to female ratio being 0.6:1.

The female preponderance in these studies may be due to health awareness or the health education in these patients.

In the present study the patients ranged from 19 to 57 years.The commonest age group was 21-30 years which had 24 (41%) patients suggesting that the disease presentation is most common in this age group. The present study is comparable with Badran et al (6),the range of age in their study was 18-57 years with mean 30± 19. Patients in their 2<sup>nd</sup> and 3<sup>rd</sup> decade of life promptly seek medical advice. Pediatric age group also present with symptoms as suggested by Albhirmay et al (4) in his study in the age group of 9-16 years. Patients in their 2<sup>nd</sup> and 3<sup>rd</sup> decade of life promptly seek medical advice. There is less number of patients above 50 years of age probably due to co-morbid conditions.

In the present study of 58 cases, the commonest presenting symptom was nasal obstruction that seen in 42(72.4%) patients.This was followed by headache, seen in 10 (17.2%) patients.Post nasal discharge was seen in 4 (6.8%) patients. 1 patient(1.7%) had complaint of epistaxis and 1(1.7%) patient had complaint of facial pain. These common presentingsymptoms like headache,nasal obstruction, nasal discharge, facial pain were also observed by others in various combinations. Headache and nasal obstructionwith facial pain (5) however the authors have not described the intensity, severity and exact duration of these symptoms.Yarmohammadi et al(3) studied the patients with headache of more than 2 months. In

the present study, CT scan of 58 patients, 25(43.1%) had unilateral concha bullosa, 33 (56.9%) had bilateral concha bullosa. A total of 91 conchae bullosa were detected. Present study correlates with Bhandari et al <sup>(5)</sup> who reports bilateral concha bullosa in 50.9% cases. However Badran et al <sup>(6)</sup> reported bilateral concha bullosa in 22(46.8%) cases.

Hatipoglu HG et al <sup>(2)</sup> studied 115 cases in which he found that 32 (47.5%) were right dominant, 30 (44.11%) were left dominant and 6(8%) were co-dominant. In our study, 10(18.18%) patients had lamellar type, 27(46.55%) had bulbous type and 21(36.2%) had extensive type of concha bullosa.

This is in exact correlation with a study by Badran et al <sup>(6)</sup> that studied 47 cases and observed lamellar concha bullosa in 8(17%), bulbous in 22(46.8%) and extensive in 17(36.2%) cases. Hatipoglu HG et al <sup>(2)</sup> studied a total of 115 cases in which he observed lamellar type in 24(20.86%) cases, bulbous in 37(32.17%) and extensive in 54(46.95%) cases.

#### **Surgical outcome:**

Badran et al <sup>(6)</sup> conducted lateral partial turbinectomy in 47 patients and observed that 15(88.2%) patients with extensive type, 16(72.7%) patients with bulbous type and 2(25%) with lamellar type showed complete improvement. Albhirmay et al <sup>(4)</sup> studied 60 patients with contact

point headache. 30 underwent evacuation conchoplasty which is equivalent to conchoplasty as in our study and 30 underwent lamellectomy. 25 (83%) patients in evacuation group were either free of pain or experienced significant relief.

Only 4 (13%) showed no improvement. In the lamellectomy group 15(50%) showed complete improvement in symptoms, 7(23.3%) had significant improvement and 8(26.6%) showed no improvement. 2 (6%) in lamellectomy group complained of reduced olfaction and 4 developed synechiae formation. Yarmohammadi et al <sup>(3)</sup> carried out a surgical technique similar to conchoplasty in 22 subjects. Severity of headache decreased markedly at the end of 3 months. Our present study is comparable with that of Yarmohammadi <sup>(3)</sup> in most of the respects.

**Conclusion:** In view of varied literature on surgical intervention of concha bullosa, it is observed that surgery in patients diagnosed with concha bullosa gives excellent results. In the present study of 58 patients who were diagnosed with concha bullosa on CT scan underwent conchoplasty. After conchoplasty the patients were followed up for one year. The observation revealed that at 6 months the patients became asymptomatic and remained so at the end of one year of follow up which is in concurrent with the study of Yarmohammadi et al <sup>(3)</sup> and Albhirmay et al <sup>(7)</sup>.

#### **References:**

1. Stammberger H and Hawke M. Endoscopic and Radiologic Diagnosis. In Essentials of Functional Endoscopic Sinus Surgery. St. Louis, U.S.A: Mosby 1993; pp.70-2
2. Hatipoglu HG, Cetin MA, Yuksel E. Concha bullosa types: their relationship with sinusitis, osteomeatal and frontal recess disease. *Diagn Intervent Radiol* 2005; 11 : 145-49.
3. Yarmohammadi ME, Ghasemi H, Pourfarzam S, Jalali Nadoushan MR and Majd SA. Effect of turbinoplasty in concha bullosa induced rhinogenic headache, a randomized clinical trial. *J Res Med Sci* 2012; 17 (3) : 229-34
4. Albirmaw O.A., Elsherif H.S., Shehata E.M., Younes A. Middle turbinate evaluation conchoplasty in management of contact-point rhinogenic headache in children. *Int J Clin Pediatr* 2012; 1(4-5): 115-23

5. Bhandari SK, Kamat PS D. Study of relationship of concha bullosa to nasal septal deviation and sinusitis. *Indian J Otolaryngol Head Neck Surg* 2009; 61:227-29.
6. Badran HS. Role of surgery in isolated concha bullosa. *Clinical Medicine Insights: Ear, Nose and Throat* 2011 ; 4 : 13-19.