

## Inferior concha bullosa: A rare cause of nasal obstruction

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### ABSTRACT

Inferior Concha bullosa (ICB) is the presence of air cells within the inferior turbinates. Superior and middle concha bullosa are frequently encountered in the clinical practice, however, inferior concha bullosa is rarely seen. ICB is generally asymptomatic but very rarely can present with nasal obstruction. Few cases of ICB presenting with nasal obstruction have been mentioned in the literature. We, hereby report the case of a 32-year-old female presented with recurrent sinusitis and nasal blockage. Imaging revealed inferior concha bullosa with thickened turbinate. Treatment with systemic antihistaminics followed by surgery resulted in resolution of symptoms. On subsequent follow-up for one year, there were no further episodes of nasal obstruction.

**Keywords:** Concha bullosa, Inferior turbinate, Nasal obstruction, Pneumatization.

The nasal turbinates are the most prominent feature of the lateral nasal wall. They are usually three sometimes four in number. The turbinates arise from the side wall of the nose and project into the nasal cavity as ridges of tissue. The lining of the turbinates is ciliated columnar epithelium. The main function of the turbinates is to warm and moisturize air as it flows through the nose. These turbinates divide the nasal cavity into groove-like channels called the nasal meatus. The ethmoid bone gives rise to the superior and middle turbinates whereas the inferior turbinate is a separate bone [1].

The presence of air cells inside the turbinate is termed as a concha. Pneumatization of the middle turbinate (also referred to as concha bullosa) is usually seen in 10% of the population [2]. But a similar entity of the inferior turbinate has rarely been reported. Inferior concha bullosa (ICB) as a cause of nasal obstruction is even rarer and only a few such instances have been described in the literature. In patients with ICB, even a mild thickening of the inferior turbinate can cause nasal obstruction. So, it is important to be aware of its presence so that timely intervention can be done. Clinically it may only be apparent as enlargement of the inferior turbinate. On Computed Tomography (CT) scan, it is detected by the presence of air density within the inferior turbinate [3].

### CASE REPORT

A 32-year-old female patient came to the Department of Otorhinolaryngology with a history of recurrent episodes of nasal discharge and nasal obstruction for 2 years. She also had some difficulty in breathing from the nose in the present episode. On examination, the vitals were stable. Clinical examination revealed

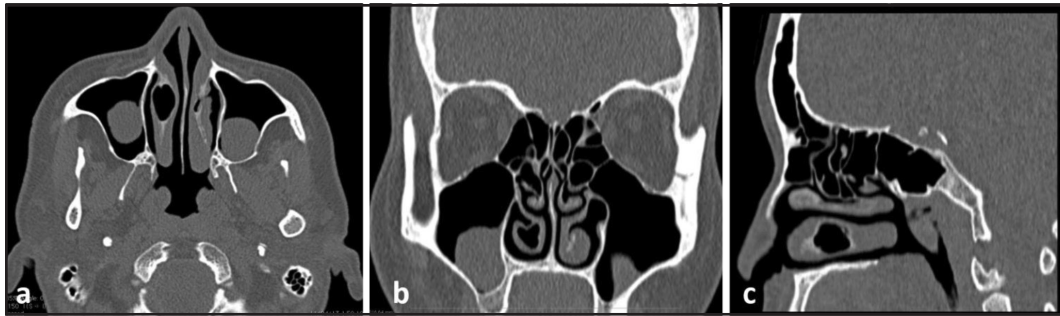
mild redness and swelling of the nose and cheek with flaring of the ala.

Anterior rhinoscopy showed congested nasal mucosa and hypertrophied turbinates which were abutting the nasal septum. She was given systemic antihistaminics before any imaging studies to relieve her breathing difficulty through the nose. Her symptoms and nasal congestion improved in 3-4 days. Given her history of recurrent nasal obstruction, a CT scan of para-nasal sinuses was ordered to rule out any anatomical cause.

The CT scan revealed right concha bullosa with associated mucosal thickening of bilateral maxillary sinuses (Fig. 1). There was decreased mucosal thickening and congestion in the nasal cavity secondary to prior antihistaminics and mild bilateral inferior turbinate hypertrophy. It was concluded that inferior concha bullosa might be the cause for her nasal obstruction even with mild nasal rhinitis. A decision was made to do a septoplasty and turbinate reduction. After surgery, she was followed-up for the next 1 year. There were no further episodes of nasal congestion and nasal obstruction.

### DISCUSSION

The nasal turbinates are the bony projections from the lateral nasal wall. Inferior nasal turbinate is the largest among three and is a separate bone. The superior and middle turbinates are part of the ethmoid bone. These turbinates have a thick lining of highly vascularized mucus membrane. The major functions of these turbinates include processing of the air before reaching the sinuses. These turbinates have a role in humidification, heating, and filtering of the air entering the nasal cavity before it reaches the sinuses [4,5].



**Figure 1:** (a) Axial, (b) coronal and (c) sagittal images showing the right concha bullosa with mild bilateral inferior turbinate hypertrophy. The note is also made of mucosal thickening of bilateral maxillary sinuses

Based on CT morphology, inferior turbinate can be divided into four types. The lamellar type characterized by the presence of thin bony lamella, the compact type with bulky osseous mass, combined type having a compact bone with central spongy bony mass, the last and the rarest type is bullous variant characterized by pneumatization of the inferior turbinate [6,7]

Various theories have been mentioned in the literature to explain the mechanism behind the pneumatization of the inferior turbinate. Most accepted theory correlates with embryological development of the turbinates. According to this theory, the inferior turbinate develops by enchondral ossification of the inferior turbinates occur from components of mesethmoid and ectethmoid from a double chondral lamella and two ossification centers. The two-separate ossification centers are formed at 5<sup>th</sup> and 7<sup>th</sup> months of gestation and fuse by the 8<sup>th</sup> month. If there is any defective epithelial invagination during this stage of ossification, a concha may develop [3,8,9,10]. Yang et al noted in his study that in 8 out of 18 inferior concha bullosa cases, air cells of the maxillary sinus extending into the inferior turbinate during fetal life [11].

ICB most of the times are asymptomatic and are found incidentally on CT scans. However, very rarely it can present with nasal obstruction whenever there is extensive pneumatization and/or superimposed infection. The patient can also present with headache, discharge from the nose, nasal discomfort and epiphora [12]. On clinical examination, both inferior turbinate hypertrophy and ICB appear similar and it is difficult to differentiate them. Whenever a patient presents with signs of nasal obstruction, a thorough evaluation including a routine physical examination and nasal endoscopy should be performed. In case of suspicion CT scan of the paranasal sinuses should be considered. Proper physical examination, nasal endoscopy and if required imaging are essential proper clinical and/or surgical treatment [13].

Most of the cases nasal obstructions due to ICB are managed conservatively with antihistaminics and topical corticosteroids. In cases where medical management fails, surgery can be considered if the condition is surgically treatable. Cold lamina, electrocauteries, laser, microincision instrument are some of the surgical options available [14]. Complete surgical excision of the turbinate is contraindicated as it may increase the possibility of developing atrophic rhinitis in the future [15].

## CONCLUSION

Inferior Concha Bullosa although asymptomatic can present very rarely with nasal obstruction. Even mild rhinitis can lead to recurrent sinusitis. So, it must be part of the differential diagnosis of nasal obstruction, so as to prevent recurrent nasal obstruction. Prior imaging can prevent surprises during common operations involving the nasal cavity such as the inferior turbinectomy.

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