An unusual pneumatisation of turbinates

M. Sagit, C. Saka, G. Kuran and I. Akin

ENT Department, Diskapi Yildirim Beyazit Training and Research Hospital

Key-words. Turbinates; anatomical variations; computed tomography scan

Abstract. An unusual pneumatisation of turbinates. Objective: To report an extremely rare case of pneumatisation of all turbinates.

Case report: A 17-year-old male patient presented with nasal obstruction. Anterior rhinoscopy and nasal endoscopic examination revealed left middle turbinate and bilateral inferior turbinate hypertrophy, septal deviation to the right. A coronal computed tomography (CT) scan of the paranasal sinuses showed pneumatisation of both superior and inferior turbinates and a left middle turbinate, and also showed pneumatisation of the right middle turbinate. The patient underwent endoscopic sinus surgery of the left side with lateral lamellar resection of the middle turbinate under local anaesthesia.

Conclusion: We present the first case in the world literature of the pneumatisation of all six turbinates.

Introduction

The anatomy of the lateral nasal wall has been investigated since the popularisation of the functional endoscopic sinus surgery. Nasal turbinates are very important structures in the maintenance of normal nasal functions. There are generally three turbinates in the lateral nasal wall on either side (superior, middle, inferior). Supreme turbinates may be located in rare cases in the upper part of the superior turbinates. The upper turbinates are parts of the ethmoid bone. However, the inferior turbinate is a separate bone. Concha bullosa is defined as the pneumatisation of the nasal turbinates. It can occur in any turbinate, but the term is usually used to describe the aeration of the middle turbinate. Concha bullosa is the most common anatomic variation of the middle turbinate. On the other hand, concha bullosa is relatively infrequent in the superior turbinates and even more uncommon in the inferior turbinates.

We present an unusual case of the pneumatisation of all six turbinates in one patient. This is the first case report in the world literature involving the pneumatisation of all six turbinates.

Case report

A 17-year-old male patient presented to our department complaining of nasal obstruction. There was no history of trauma or smoking, and allergen skin prick tests were normal. Anterior rhinoscopy and nasal endoscopic examination revealed left middle turbinate and bilateral inferior turbinate hypertrophy, septal deviation to the right. Coronal computed tomography (CT) scan of the paranasal sinuses showed pneumatisation of both superior and inferior turbinates and a left middle turbinate, and also showed pneumatisation of the right middle turbinate (Figures 1-3). The aerated cavity in the turbinates did not communicate with any of the paranasal sinuses. The patient underwent endoscopic sinus surgery of the left side with lateral lamellar resection of the middle turbinate under local anaesthesia.

Postoperative CT scan after one year showed better aeration and more nasal space. The patient was also symptom-free (Figure 4).

Discussion

Interest in paranasal sinus anatomy and variations has increased since the introduction of functional endoscopic sinus surgery. The knowledge of anatomical variations is most important in surgical management and, specifically, in the prevention of complications. Anatomical variations can be

broken down into structural abnormalities, increased pneumatization and supplementary openings. Four

Pneumatization of the middle turbinate is common and is called concha bullosa. Concha bullosa is the most common anatomic variation of the middle turbinate. Its incidence has been reported at 8 to 20% in the normal population and its prevalence varies from 33 to 43.9% in patients with rhinosinusitis. Concha bullosa is relatively infrequent in the superior turbinates and even more uncommon in the inferior turbinates. There are only 12 reports of pneumatization of the inferior turbinate. The largest series were found by Christmas et al. with 3 cases and Ozturk et al. with 10 cases. In addition, Braun and Stammberger reported the pneumatization of five of the six turbinates in one patient. However, to our knowledge, there has been no report of the pneumatization of all six turbinates in the world literature to date.

Clinically, it is difficult to distinguish pneumatization of the turbinate from turbinate hypertrophy without a CT scan of the paranasal sinuses. A classification analogous to that suggested for middle turbinate pneumatization by Bolger et al. was proposed for the inferior turbinate by Ingram and Richardson. According to this classification, lamellar type concha bullosa is a pneumatization localized in the vertical lamella of the turbinate, bulbous type concha bullosa is a pneumatization localized in the inferior (bulbous) part of the turbinate, and extensive type concha bullosa is a pneumatization localized in the vertical lamella and inferior part of the turbinate. In this case, CT examination revealed pneumatization of both the superior and inferior turbinates, and the left middle turbinate bulbous type, as well as pneumatization of the right middle turbinate lamellar type.

Symptoms often associated with various levels of turbinate pneumatization include nasal obstruction or congestion, facial pain and headache. Pneumatization of the middle turbinate and contact with the nasal septum is known to be associated with headache and facial pain. In cases of extensive middle turbinate pneumatization, there may be narrowing or even obstruction of the natural opening of the middle nasal meatus. This can result in paranasal sinusitis. Pneumatization of the superior turbinate may cause migraine-type headache, even without evidence of mucosal disease, and pneumatization of the inferior turbinates, generally asymptomatic, can cause nasal obstruction. Headache caused by mucosal contact may also be seen.
In cases with prominent inferior turbinate pneumatisation, the lachrymal passage may be affected and epiphora may develop.\textsuperscript{10}

Turbinate pneumatisation is not treated when the patient is asymptomatic. However, surgical treatment may be given in symptomatic cases. If both the middle and inferior turbinate are affected, resection of the lateral lamella should be the treatment of choice.\textsuperscript{4} Inferior concha bullosa with extension into the maxillary sinus that is resected with lateral lamella resection may result in an iatrogenic inferior meatal antrostomy. For cases like this, then, Unlu \textit{et al.}\textsuperscript{5} reported another method: they modified a middle turbinoplasty technique for resecting the inferior turbinate. Using this technique, a part of the medial bony lamella of the inferior concha bullosa can be resected, preventing iatrogenic inferior meatal windows. There was a major reduction in symptoms in symptomatic superior turbinate concha bullosa patients treated with partial superior turbinectomy to eliminate mucosal contact between the superior turbinate and the septum.\textsuperscript{12}

\textbf{Conclusion}

In conclusion, we present the first case in the world literature of the pneumatisation of all six turbinates. Resection of the lateral lamella of the left middle turbinate reduced the clinical symptoms.

\textbf{References}


Mustafa Sagit
Yakacik Mahallesi Bulut Sokak No:40/13
06310 Keçiören-Ankara, Turkey
Tel.: +903123593883
Fax: +903123186690
E-mail: musagit@yahoo.com