Case Report

Inferior Concha Bullosa Communicating into the Maxillary Sinus: Case Report

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Abstract

Concha bullosa or conchal pneumatization refers to the presence of an air cell within a nasal turbinate. Pneumatization is most commonly seen in the middle turbinate followed by the superior turbinate. Pneumatized inferior turbinate is rare, and most of the papers in the literature appear as case reports. In this study, a 33-year-old female patient complaining from unilateral nasal stuffiness and intermittent headache is presented. Symptomatology, diagnostic and therapeutic methods for inferior concha bullosa is discussed. In clinical practice, the pneumatization status should well be studied on the scans before sinus and turbinate surgery and inferior concha bullosa should be kept in mind.

ABBREVIATIONS

CT: Computerized Tomography

INTRODUCTION

Inferior turbinates are important anatomical structures located along the lateral nasal wall. The middle and superior concha, and occasionally the supreme concha, are parts of the ethmoid bone, whereas the inferior nasal concha is an independent bone [1]. The inferior concha is bounded anteriorly by the internal nasal valve and posteriorly by the choana. Moreover, it is responsible for filtration, heating, and humidification of the air inhaled through the nose. It is also responsible for 2/3 of the airway resistance and thus even small changes in the size of the inferior concha may lead to major alterations [1,2]. With the growing use of computed tomography (CT) in the diagnosis of the inferior concha, the frequency of anatomical variations of the concha has increased [3]. In terms of frequency, concha bullosa is the most common anatomic variant of the middle turbinate. As an alternative, concha bullosa is relatively infrequent in the superior turbinates and even more uncommon in the inferior turbinates [4]. Inferior concha bullosa incidence detected in paranasal CT images is between 0.03 to 4.88 %, incidentally. Even though, the sex ratio (male to female) is close to one another the rate is slightly more common in women. The average age is seen with 36 to 42.1, besides this the disease can occur at every age [3,5]. Although the inferior concha and the maxillary sinus are of different embryological provenance, our patient presented with inferior concha pneumatization associated with the maxillary sinus. Here, we present this rare case with the review of the literature.

CASE PRESENTATION

A 33-year-old female patient presented to our clinic with a 2-year history of nasal obstruction, headache and intermittent postnasal drip. Anterior rhinoscopy and nasal endoscopy revealed that the right inferior concha was hypertrophic and the nasal septum was deviated to the left.

A coronal section computerized tomography (CT) scans showed pneumatized right inferior concha and an air-filled sac in the pneumatized inferior concha associated with the right maxillary sinus (Figure 1-3). Septoplasty and submucous resection (SMR) of the inferior concha were recommended but the patient objected to the proposed surgeries and thus was followed up.

DISCUSSION

Concha bullosa, also known as pneumatized concha, is an anatomical variation of the middle concha, consisting of pneumatization. It is mostly seen in the middle concha and rarely seen in the inferior concha [4]. Inferior concha bullosa was first described by Zinreich [6]. There are three hypotheses regarding the development of an inferior concha bullosa. The first suggests that the inferior concha is ossified from two separate centers and two cartilaginous lamellae during the fetal life. Two ossified
Pneumatization extends into the inferior turbinate, and this finding can be readily seen in axial CT [5]. In our patient, we considered that the mechanism of the development of inferior concha was similar to that of the third hypothesis since the pneumatization in our patient was associated with the maxillary sinus. Though very rare, inferior concha bullosa associated with the maxillary sinus has been reported in several studies in the literature. In a study by Yang et al., 8 out of the 18 cases of inferior concha bullosa were associated with the maxillary sinus [5]. Another study by Baldea et al., [3] 6 out of the 10 cases of inferior concha bullosa were associated with the maxillary sinus.

Inferior concha bullosa is usually asymptomatic and incidentally diagnosed on paranasal CT [7]. Although the pneumatization of the inferior turbinate generally does not give any symptoms, nasal obstruction, rhinorrhea and dysosmia may be seen due to severe pneumatization and enlargement of the inferior concha. In patients with large pneumatization, inferior concha bullosa may lead to headache as a result of mucosal contact and epiphora as a result of nasolacrimal duct blockage [4,8].

Endoscopic examination reveals no findings that could indicate inferior concha bullosa except for concha hypertrophy. Therefore, CT remains the most ideal method in the diagnosis of inferior concha bullosa. In particular, coronal section CT is a valuable tool for the diagnosis of inferior concha bullosa. It is usually identified as incidental in the CT images taken by other reasons. Yang et al., [5] reported that 16 patients with inferior concha bullosa were detected in 59238 CT images performed for another reason. In another study, Baldea et al., [3] determined 10 patients with inferior concha bullosa in 205 paranasal CT images taken by other reasons.

Cone-beam computed tomography (CBCT) is a technique first announced in Italy in 1997 [9]. Among its advantages are lower radiation dose compared to standard computed tomography (CT), used in medical tomography, and its high spatial resolution of bone tissue, which makes it a widely used method in general dental practice [10,11]. However, we have not a CBCT scan in our Radiology department so that we couldn’t take an image with CBCT for our patient.

There is no need for treatment in asymptomatic inferior concha bullosa. The goals of treatment are to maximize the nasal airway, to preserve nasal mucosa function, and to minimize complications. Medical treatment such as steroid nasal sprays may be attempted, but often are not successful in these cases and surgery is required. The most common methods used in the treatment of inferior concha bullosa include injection of steroids or sclerosing agents into the submucosal area, radiofrequency ablation, cauterization, cryoturbinectomy, and concha resection [1,12]. Out fracture of the inferior concha, resection of the lateral lamella of the concha bullosa of inferior turbinate, or submucous resection are the surgical treatment options in the management of the symptomatic concha bullosa [7,8] (Table 1). Unlu et al., suggested that partial turbinectomy can be performed in cases of inferior concha bullosa that have no association with the maxillary sinus but performing partial resection in the cases extending to the sinus may cause inferior meatalantrostomy, leading to
Table 1: The table summarizing age of diagnosis, symptoms of presentation, treatment and outcome.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Age</th>
<th>Sex</th>
<th>Complaint</th>
<th>CT findings</th>
<th>Treatment</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ural A, Uslu S.</td>
<td>23</td>
<td>M</td>
<td>Left nasal obstruction</td>
<td>Sol alt kon kabülloza</td>
<td>Out fracture and radyofrequency</td>
<td>Close to full recovery</td>
</tr>
<tr>
<td>Kiroglu AF, et al.</td>
<td>14</td>
<td>F</td>
<td>Nasal blockage, nasal pain, and purulent discharge at the left side</td>
<td>Pneumatization of the left inferior turbinate</td>
<td>The lateral lamella of the inferior Conchabullosa was resected</td>
<td>Nasal obstruction was resolved After surgery</td>
</tr>
<tr>
<td>Pittore B, Al Safi W, Jarvis S.</td>
<td>24</td>
<td>F</td>
<td>Rhinorrhoea and nasal obstruction</td>
<td>Pneumatization of the left inferior turbinate</td>
<td>The inferior concha bullosa was resected removing the free edge of the inferior turbinate using turbinectomy scissors</td>
<td>Nasal obstruction had improved significantly</td>
</tr>
<tr>
<td>Yuca K, et al.</td>
<td>37</td>
<td>F</td>
<td>Nasal obstruction</td>
<td>Right inferior concha bullosa</td>
<td>Patient did not accepted any kind of surgery</td>
<td>Patient did not return for follow up</td>
</tr>
<tr>
<td>Baykara M, Polat C, Uysal O, Soylu E.</td>
<td>37</td>
<td>F</td>
<td>Left nasal obstruction and headache</td>
<td>Left inferior concha bullosa</td>
<td>Patient did not accepted any kind of surgery</td>
<td>Patient did not return for follow up</td>
</tr>
<tr>
<td>Akgün F, Erdoğan BA, Bora F</td>
<td>35</td>
<td>F</td>
<td>Nasal obstruction</td>
<td>Bilaterally inferior and middle concha bullosa</td>
<td>Bilaterally out fracture and radyofrequency</td>
<td>Nasal obstruction had improved significantly</td>
</tr>
<tr>
<td>Ingram WA, Richardson BE.</td>
<td>38</td>
<td>F</td>
<td>Nasal obstruction and post nasal discharge</td>
<td>Left inferior concha bullosa</td>
<td>Patient did not accepted any kind of surgery</td>
<td>A little complaints of the patients were resolved with medical treatment</td>
</tr>
</tbody>
</table>

In conclusion, inferior concha bullosa should be kept in mind in the differential diagnosis of commonly encountered inferior hypertrophy. A suitable treatment should be planned for symptomatic cases and the association between the concha bullosa and the maxillary sinus should be investigated prior to surgical planning.

REFERENCES