Case Report / Olgu Sunumu

Bilateral superior concha bullosa: a rare case overlooked

İki taraflı süperior konka bülloza: Gözden kaçan nadir bir olgu

Turhan San, M.D.[1] Barış Erdoğan, M.D.[1] Bülent Taşel, M.D.[2]

[1]*Department of Otolaryngology, Medeniyet University Göztepe Training and Research Hospital, İstanbul, Turkey*
[2]*Department of Radiology, Medeniyet University Göztepe Training and Research Hospital, İstanbul, Turkey*

Concha bullosa is generally defined as the pneumatization of the middle turbinate and, rarely, of the superior or the inferior turbinates. A symptomatic pneumatization of the superior turbinate is extremely rare. When symptomatic, concha bullosa may cause various problems. Concha bullosa can be easily recognized in paranasal sinus computed tomography. In this article we present a very rare case with bilateral pneumatization of the superior turbinates in a patient with relevant symptomatology.
Keywords: Anatomic variation; computed tomography; concha bullosa; superior turbinate.

Konka bülloza, genellikle orta konkanın ve nadir olarak da üst veya alt konkaların pnömatizasyonu olarak tanımlanır. Üst konkanın semptomatik bir pnömatizasyonu oldukça nadirdir. Semptomatik olduğunda konka bülloza çeşitli sorunlara neden olabilir. Konka bülloza paranazal sinüs bilgisayarlı tomografi ile kolayca saptanır. Bu makalede iki taraflı üst konka büllozalı oldukça nadir bir olgu ilişkili semptomlarıyla birlikte sunuldu.
Anahtar Sözcükler: Anatomik varyasyon; bilgisayarlı tomografi; konka bülloza; üst konka.

Compared with other turbinates, the superior turbinate has been the least accessible and most neglected. Thus, the superior turbinate is called the "forgotten turbinate" and only very few clinical conditions have been reported to be associated with superior turbinate pneumatization. Although very rare, superior turbinate pneumatization, as a result of contact with the nasal mucosa may lead to migraine headache.

We present a case of bilateral pneumatization of the superior turbinate with accompanying mucosal contact, associated with bilateral maxillary sinusitis and septal deviation.

CASE REPORT

A 43-year-old man was admitted to our clinic with complaints of nasal obstruction and headache lasting for years. Nasal obstruction was more evident on the left side and headache was located over the forehead. Anterior rhinoscopic examination revealed a nasal passage nearly completely obstructed by deviated nasal septum on the left side. Endoscopic examination showed mucosal contact between the nasal septum and superior turbinate on the left side. Anterior rhinomanometry was performed after decongestion of the nose and a significant

Available online at
www.kbbihtisas.org
doi: 10.5606/kbbihtisas.2014.52385
QR (Quick Response) Code

Received / *Geliş tarihi:* September 19, 2013 Accepted / *Kabul tarihi:* January 30, 2014
Correspondence / İletişim adresi: Turhan San, M.D. Barbaros Mah. Uphill Court Sitesi, B-5 Blok, D: 79, 34746 Ataşehir, İstanbul, Turkey.
Tel: +90 532 - 243 41 16 e-mail *(e-posta):* turhansan@gmail.com

decrease in nasal resistance was observed. A coronal plain computed tomography (CT) scan of the paranasal sinuses demonstrated concha bullosa of the superior turbinates, a complete the nasal septal deviation on the left and inflammatory mucosal thickening in both maxillary sinuses (Figure 1).

Only septoplasty was performed under local anesthesia. The superior turbinate pneumatizations were left untouched, since they were not causing significant clinical pathological consequences. No postoperative complication was seen. The patient's headache and nasal obstruction resolved.

DISCUSSION

The nasal turbinates are important anatomical structures of the nasal cavity and extend from the lateral nasal walls into the nasal cavity. The nasal turbinates are essential structures for the maintenance of normal nasal function. They are related to various functions of the nasal cavity, including olfaction, humidification, lubrication of the upper airways, regulation of airflow and temperature, as well filtration.[1]

The term concha bullosa is generally used to describe pneumatization of the middle turbinate and rarely, of the superior or inferior turbinates.[2] Only a few cases have been reported to be related to the superior turbinate.[3] The development mechanism of concha bullosa is not fully understood. Generally, the superior turbinate has been the least accessible and most neglected turbinate. For this reason, another name of the superior nasal turbinate is the "forgotten turbinate."[4]

Figure 1. *Coronal computed tomography scan shows pneumatized bilateral superior turbinates (arrows), deviated septum to left and bilateral maxillary sinusitis.*

In recent years, the advancement of imaging techniques such as paranasal sinus CT has provided us detailed information about this inaccessible area of the superior nasal cavity. Christmas et al.[5] and Clerico[4] have suggested that nasal endoscopy does not allow ready access to this area. For endoscopic visualization of the superior turbinate, direct application of topical anesthetic or injection of local anesthetic may be required. In our patient, the endoscopic view of the nasal cavity was not indicative of pneumatization of the superior turbinates, but a coronal plain paranasal sinus CT imaging allowed us to diagnose the pathology.

Messerklinger was the first to notice superior turbinate pneumatization and described it as a rare asymptomatic variation. Its frequency was reported to be as high as 48% in various tomography studies. Ozcan et al.[6] found incidental pneumatization of the superior turbinate in 12.2% in their cases. A symptomatic pneumatization of the superior turbinate is extremely rare. If the pneumatization is extensive, due to mucosal contact and mechanic obstruction, it may cause significant symptoms such as nasal obstruction, migraine-like headache and smell disorders.[3] Clerico[4] was the first to suggest the superior turbinate as a source of referred headache, with features consistent with common migraine. Association of a massive extensively pneumatized superior turbinate with headache is very rare. Massive pneumatization of superior turbinates with accompanying mucosal contact can be the cause of headache even in the absence sinonasal inflammation.[7] Concha bullosa of the superior turbinate can be determined on coronal CT images clearly but mucosal contact should be evaluated by nasal endoscopy.

When the superior concha bullosa is asymptomatic, one should avoid touching it as there are two possible risks of partial resection of the superior concha. The first is hyposmia,

because the olfactory neuroepithelium extends into the medial surface of the superior turbinate. The second possible complication is cerebrospinal fluid leak, since the superior turbinate is in close proximity to the skull base and cribriform plate. Knowledge of anatomical variants with accompanying pathologies will directly influence the success of diagnostic and therapeutic management of paranasal sinus diseases. For surgeons to be aware of the variations is important in order to avoid possible complications. Correct description of anatomical variations and the use of common terminology are important in achieving correct diagnosis and reliable surgery.

In conclusion bilateral superior concha bullosa is an uncommon anatomic variation. Variations of the superior turbinate can be overlooked by endoscopic examination, but can be easily recognized on paranasal sinus CT. A coronal plain CT of the paranasal sinuses can determine exactly the anatomic variations in this area and their relation to mucosal pathologies. Also, paranasal sinus CT scans play an important role in diagnosis and treatment planning.

Declaration of conflicting interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The authors received no financial support for the research and/or authorship of this article.

REFERENCES

1. Lee HY, Kim CH, Kim JY, Kim JK, Song MH, Yang HJ, et al. Surgical anatomy of the middle turbinate. Clin Anat 2006;19:493-96.
2. Bolger WE. Anatomy of the paranasal sinuses. In: Kennedy DW, Bolger WE, Zinreich SJ, editors. Disease of the Sinuses. London: BC Decker; 2001. p. 1-12.
3. Unlu HH, Altuntas A, Aslan A, Eskiizmir G, Yücel A. Inferior concha bullosa. J Otolaryngol 2002;31:62-4.
4. Clerico DM. Pneumatized superior turbinate as a cause of referred migraine headache. Laryngoscope 1996;106:874-79.
5. Christmas DA, Ho SY, Yanagisawa E. Concha bullosa of a superior turbinate. Ear Nose Throat J 2001;80:692-4.
6. Ozcan KM, Selcuk A, Ozcan I, Akdogan O, Dere H. Anatomical variations of nasal turbinates. J Craniofac Surg. 2008;19:1678-82.
7. Kantarci M, Karasen RM, Alper F, Onbas O, Okur A, Karaman A. Remarkable anatomic variations in paranasal sinus region and their clinical importance. Eur J Radiol 200;50:296-302.