All Concha Bullosa: An Undefined Abnormality of the Lateral Nasal Wall

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Abstract Pneumatization of the turbinates, are the anatomic variations of lateral nasal wall. Turbinate pneumatization, refers to the existence of air cell inside the turbinates. Pneumatization of the middle turbinate is common, whereas rare in the superior and especially inferior turbinate. In this report we presented a case who has bilaterally pneumatization of all conchas.

Keywords Concha bullosa · Lateral nasal wall · Pneumatization

Introduction

Pneumatization of the turbinate or concha bullosa (CB) is a common anatomic variation of the lateral nasal wall. Middle CB is commonly seen, whereas the superior and inferior CB is extremely rare. Turbinates at the nasal cavity have many functions including hydration, lubrication of the upper respiratory system, arrangement of airflow, filtration, smelling and thermoregulation [1]. These functions might be deteriorated with presence of a CB. We reported bilateral pneumatization of all conchas (superior, middle and inferior) except left middle concha. In the literature review, we did not find any report about the pneumatization of all conchas at the nasal cavity.

Case Report

A 37 year old nonsmoker female patient came to our clinic with nasal obstruction, persistent headache, postnasal discharge and occasional epistaxis symptoms. She had experienced these complaints over 20 years. The patient and her family hadn't notable systemic disease, maxillofacial trauma or allergy. The patient had been treated several times with different medications (local or systemic treatment), but no improvement or regression on the symptoms were achieved. Endoscopic nasal examination revealed hypertrophy of the bilateral inferior turbinates (Fig. 1) and right middle turbinate, septal deviation to the left side and unhealthy nasal mucosa. Computed tomography (CT) showed bilateral inferior CB's, which were directly communicated with ipsilateral maxillary sinuses, septated right middle CB, bilateral superior CB's, right uncinate pneumatization, septal deviation to the left side, and sinusitis (Fig. 2).

After medical treatment endoscopic sinus surgery and septoplasty were performed under general anesthesia. Additionally, lateral lamella of the right middle concha was resected, superior CB was crushed and outfracture, crushing and radiofrequency thermocoagulation were performed to inferior turbinates. Other surgical approaches like inferior turbinoplasty might cause an inferior meatal antrostomy and sinus disease [2]. After surgery the patient's complaints were healed immediately.

Discussion

Nasal turbinates develop from the lateral nasal wall embryologically. Six ridges develop initially from lateral nasal wall, then superior and supreme turbinates develop

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Fig. 1 Endoscopic image of the right inferior concha and unhealthy nasal mucosa

from the fourth ridge, middle turbinate develops from the third ridge and inferior turbinate from maxilloturbinal structure which is a non ethmoidal structure [3].

The exact cause of CB is still unknown [4]. There are many acceptable hypotheses about this subject. One prominent hypothesis is the expansion of sinus pneumatization into the turbinate during intrauterine period [5]. The second hypothesis is the fusion abnormality in the intra-uterine development. The chondral lamella and ossification areas were emerged between 5th and 7th months of intra-uterine period and fused in the 9th month. Fusion abnormality might lead to CB during this period. The third hypothesis is conchal bone microfractures especially in middle turbinate during late puberty. This microfractures

might create nasal mucosal invagination expanding to bullosa cavity and finally leading to CB [2, 4].

Superior CB (SCB) is a quite rare abnormality and usually seen together with the other nasal anatomic abnormalities. In our case, the SCB was bilateral. SCB was first identified as a source of referred headache by Clerico [6]. SCB may cause migraine-type headache. SCB region is usually unreachable in nasal endoscopic examination, therefore CT scan is used primarily in the diagnosis. Middle CB (MCB) is classified into three subtypes: vertical lamellar pneumatization, inferior bulbous pneumatization and mix type [7]. In our case, the MCB was mix type. Middle concha pneumatization mainly originate from the anterior ethmoid cells but may be originated from the agger nasi cells, frontal recess, sinus lateralis, posterior ethmoid cells, or directly the middle meatus [3]. Inferior concha bullosa (ICB) is first recognized by Zinreich and fairly rare seen [8]. Clinically, inferior conchal hypertrophy and ICB is very similar to each other, using vasoconstrictor spray or CT scan may useful in the differential diagnosis.

The relationship between concha bullosa and sinusitis or septal deviation were investigated in many studies. Some authors claimed CB particularly bulbous type has an important role in the development of recurrent or chronic sinusitis [9]. Similarly the presence of septal deviation is usually related to the existence of large concha bullosa.

The frequency of CB in women was higher than men. CB can lead to nasal obstruction, persistent headache, postnasal discharge, and epistaxis. The contact between CB and adjacent nasal structures may lead to headache via substance P and ophthalmic (V1) or maxillary (V2) branch of the trigeminal nerve. Chemical, caloric and mechanical irritants can stimulate the release of substance P in mucosal contact surfaces and may cause headache [6, 10].

Fig. 2 Bilateral ICB and SCB, right CB, right pneumatized uncinate process septal deviation to the left side and unhealthy nasal mucosa on the PNSCT

If nasal obstruction doesn't regress enough by using vasoconstrictor spray, CB must be suspected in the cases with conchal hypertrophy [7].

CB is usually identified coincidentally in radiographs. The presence of symptoms is a treatment indication in CB. Medical treatment is frequently inadequate and CB requires surgical treatment. Endoscopic resection of lateral portion of the CB may heal CB symptoms significantly. The most common conchal surgical techniques are conchal out-fracture, crushing, excision of the free edge of CB, microdebrider turbinoplasty and diathermy [10]. Turbinoplasty is contraindicated in the presence of communication between the ICB and maxillary sinus. Because it may lead to inferior meatal antrostomy and clearance problems of the maxillary sinuses. Crushing or concha out-fracture is enough for the most of small CB cases. Total turbinectomy shouldn't be performed because of the risk of atrophic rhinitis [8]. Our patient was treated with a successful transnasal endoscopic surgery.

Conflict of interest None.

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