

Concha bullosa mucocele and mucopyocele: A series of 4 cases

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Abstract

Concha bullosa is an aerated turbinate in the nose. It is a common anatomic variant that can develop a mucocele if obstructed, which can further progress to become a mucopyocele if infected. A mucopyocele can expand and cause destruction of neighboring tissues. A review of the literature revealed only 10 cases previously reported. We describe 2 cases of mucocele and 2 cases of mucopyocele.

Introduction

Concha bullosa, or turbinate aeration, is considered to be the most common anatomic variant of the middle turbinate.¹ Although it usually remains asymptomatic, a large concha bullosa can occasionally compromise drainage of the sinuses.¹ A concha bullosa air cavity is lined with the same epithelium as the rest of the nasal cavity; these cells can develop the same inflammatory disorders that occur in the paranasal sinuses.² Obstruction of the concha bullosa can lead to mucocele formation; eventually, the mucocele can become a mucopyocele if it becomes secondarily infected.³ Mucopyocele is not a common phenomenon; only 10 cases have been reported in the English literature.^{1,3}

Case reports

Patient 1. A 13-year-old girl was evaluated for a 9-month history of nasal obstruction. She also complained of headaches, snoring, mouth breathing, anosmia, and occasional epistaxis. The physical examination revealed a right-sided, reddish mass on anterior rhinoscopy. No other abnormalities were detected.

Computed tomography (CT) revealed a 4.7 × 2.3 × 2-cm oval-shaped mass in the right nasal cavity (figure 1). The mass had displaced the nasal septum to the left,

with calcification and erosion of the bony labyrinth. The right frontal, ethmoid, and maxillary sinuses were obliterated. The sinuses on the left, as well as both sphenoid sinuses, were clear. The report suggested a neoplastic lesion, but a granulomatous lesion could not be ruled out.

The right nasal mass was biopsied for evaluation. Histopathology reported the presence of an inflammatory polyp with focal epithelial hyperplasia and no evidence of malignancy. Subsequently, the right middle turbinate was resected under general anesthesia. It contained purulent material and a mycotic infection. A diagnosis of mucopyocele was made. The medial and lateral laminae were removed. A middle meatal antrostomy, anterior and posterior ethmoidectomy, and frontal recess clearing were performed. The patient's treatment was completed with IV ceftriaxone, 1 g/day for 3 days, and amphotericin B irrigation for 30 days. Three years of follow-up revealed a patent right nasal airway and clear paranasal passages.

Patient 2. A 39-year-old woman presented with a history of right-sided nasal obstruction, as well as right-sided headaches and facial pain. She reported anosmia and mucopurulent nasal discharge with postnasal drip. On direct rhinoscopy, greenish nasal discharge was visualized. Her right-sided, large middle turbinate almost occluded the right nasal airway. Examination revealed bilateral inferior turbinate hypertrophy.

CT scan of the nasal cavity and paranasal sinuses showed a blocked right ostiomeatal complex and a soft-tissue lesion expanding the right nasal cavity with posterior nasopharyngeal extension and a right concha bullosa. Right maxillary sinusitis was also noted. The frontal and sphenoid sinuses appeared normal bilaterally, and there was no evidence of bone destruction. Bilateral inferior turbinate hypertrophy was also noted. A diagnosis of mucocele was made.

The patient underwent a right concha bullosa lateral-wall marsupialization and bilateral partial inferior turbinectomy under general anesthesia. The procedure emptied mucus from the middle turbinate.

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Figure 1. Patient 1. **A:** CT scan shows that the mucopyocele extends to the right anterior nostril, as shown in this axial cut. **B:** In this sagittal cut, the mucopyocele is seen obliterating the right nasal cavity. **C:** In this coronal cut, the mucopyocele is also seen obliterating the right nasal cavity.

Postoperatively, IV ceftriaxone was given at 1 g/day for 3 days. The patient became symptom-free, and at the 1-year follow-up, she had a patent right nasal airway and clear paranasal passages.

Patient 3. A 47-year-old man was referred by an ophthalmology tertiary care center. He was complaining of right eye pain and bulging of the right orbit for 1 month. He denied any changes in his visual acuity. The patient also complained of right-sided nasal obstruction for about the same period of time, but he denied anosmia, altered perception of smell, and epistaxis.

On examination, the patient had proptosis of the right eye. Visual acuity was 20/20 with no defects in the visual fields, and there was no neurologic deficit. Anterior rhinoscopy showed a deviated septum to the right side with no anomalies detected in the nasal cavity.

CT scan of the orbit and nasal cavity with contrast revealed a large, well-circumscribed mass in the right ethmoid labyrinth (figure 2, A). The mass was about 28 × 36 mm in size. It had an enhanced rim with a mild enhancement of the lateral portion. The right globe was displaced anteriorly and laterally (figure 2, B). A diagnosis of mucopyocele was made.

Marsupialization of both medial and lateral lamellae of the right middle turbinate was performed under general anesthesia. A significant discharge of purulent matter under pressure was observed. The area was drained and lavaged. The patient then received antibiotic treatment for 1 week. He was followed for 18 months. His pain disappeared, and his eye regained its normal position.

Patient 4. A 24-year-old woman was referred by a primary care center with complaints of a deformed nose and nasal blockage. She denied any history of

headaches, epistaxis, postnasal drip, or nasal trauma. On examination, external, left-sided deviation of her nose was noted. Anterior rhinoscopy showed a deviated nasal septum to the left side and inferior turbinate hypertrophy.

A plain coronal CT scan of the paranasal sinuses revealed an absent frontal sinus and thickening of the mucosal lining of the paranasal sinuses. The ostiomeatal complexes were blocked bilaterally, and the left maxillary sinus was filled with fluid. A bilateral concha bullosa and a left-sided septal deviation were noted, along with an air-fluid level in the left concha bullosa suggesting a mucocele on the left.

A septorhinoplasty was performed via an external approach under general anesthesia. The lateral lamella of the middle turbinate was resected, and bilateral middle meatus antrostomies were done. Two years of follow-up revealed a patent nasal airway and no nasal obstruction.

Discussion

The middle turbinate functions as a moisturizer of inspired air. It helps laminate airflow and deflects inspired air superiorly toward the olfactory epithelium.³ A pneumatized middle turbinate, i.e., a concha bullosa, can be unilateral or bilateral. This pneumatization usually originates from the anterior or posterior ethmoid cells. The incidence of concha bullosa varies from 14 to 53%.⁴ Unless the concha bullosa is large enough to obstruct the nasal airway or the sinus ostia, it is often asymptomatic and is only found incidentally on CT scanning. We have presented 4 cases of concha bullosa pathology: 2 cases of mucocele and 2 cases of mucopyocele. The mucopyocele cases demonstrate that entity's

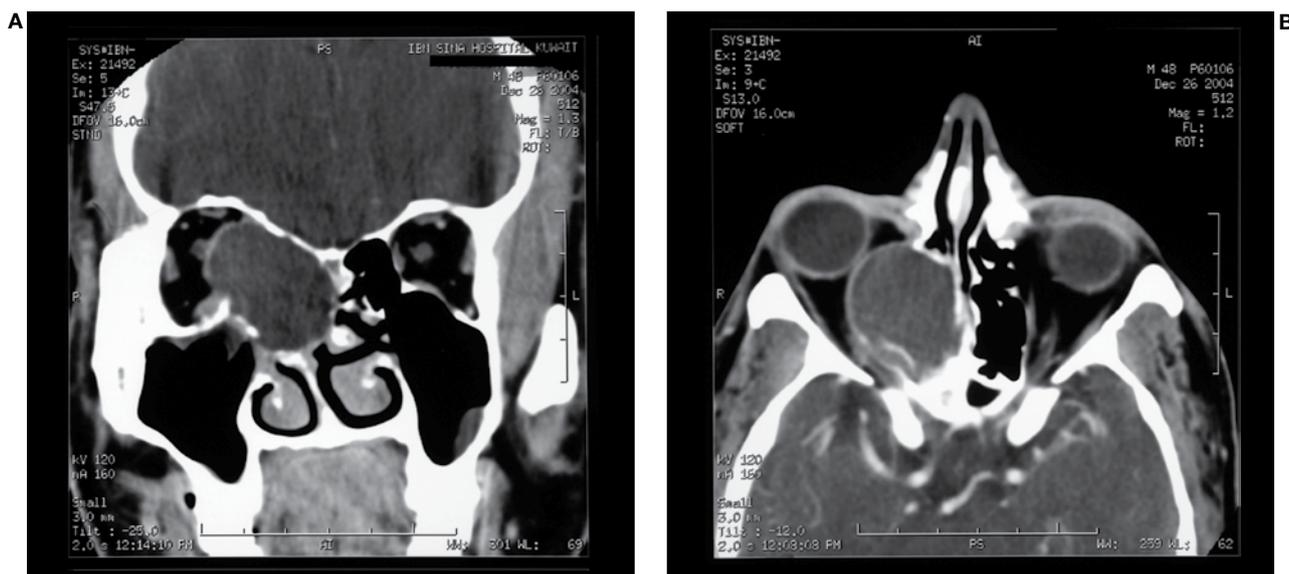


Figure 2. Patient 3. A: Coronal CT scan shows the right-sided mucopyocele in the right ethmoid labyrinth. B: This axial CT shows the mucopyocele displacing the orbit.

destructive abilities; one patient had bony erosions of the nasal cavity and the other had invasion of the orbit.

While anterior rhinoscopy is an essential method of nasal cavity examination, it is not appropriate for

evaluating a concha bullosa or a mucopyocele. It can only help to appreciate the size and degree of nasal airway obstruction. The availability of CT scans and magnetic resonance imaging (MRI) has made the diagnosis of nasal masses easier. Good information about the nasal cavity and paranasal sinuses is provided by the CT scan, which can help differentiate a concha bullosa from a mucopyocele. A mucopyocele can also be suggested in the presence of peripheral enhancement of a mucocele on a CT scan.

CT images of our first patient suggested a possible neoplastic lesion.^{2,4} If a CT scan cannot rule out neoplasia, an incisional biopsy is recommended, as was done in patient 1. Although CT is usually considered a sufficient imaging method to evaluate a concha bullosa, MRI is sometimes more effective in evaluating intracranial and intraorbital paranasal sinus disease.

The association between a concha bullosa and paranasal sinus disease is debatable. A positive association between concha bullosa and paranasal sinus and ostiomeatal unit (OMU) abnormalities has been noted in the literature.^{5,6} On the other hand, some authors have concluded that concha bullosa is not a major factor in the genesis of sinus and OMU pathology.^{7,8}

Endoscopic surgery is the recommended treatment for mucoceles and mucopyoceles. Marianowski et al described four techniques to manage concha bullosa surgically (lateral marsupialization, medial marsupialization, crushing, and transverse excision).¹

Two of our cases (patients 1 and 3) were managed with lateral marsupialization of the middle turbinate,

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while resection of both medial and lateral lamellae of the concha bullosa was performed in patients 2 and 4. Braun and Stammberger concluded that resection of the lateral lamella, including the ostium of the middle turbinate, is the treatment of choice for a case of concha bullosa.⁹ We performed resection of the medial lamella in addition to lateral marsupialization in 2 cases. We think that the large size of the middle turbinate in these 2 cases justified this mixed procedure.

Resection of the medial lamella can cause instability of the middle turbinate, since it is attached by its medial lamella to the base of the skull. Therefore, medial marsupialization should not be performed for large conchae bullosa.

In conclusion, a concha bullosa may, in rare instances, develop a mucocele or mucopyocele. These can enlarge to cause obstructive symptoms and can present extranasal complications, especially in the case of a mucopyocele. CT is a good imaging modality to evaluate middle turbinate pathology. When a concha bullosa is symptomatic, endoscopic surgical intervention is required.

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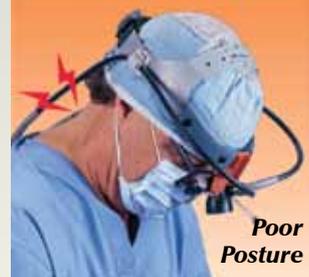
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