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Double Mucocele of the Paranasal Sinuses

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Summary: We have observed two contiguous mucoceles in one patient. Based on the mucoceles' signal intensities on MR imaging, as well as their anatomic location as delineated by CT and MR, we hypothesize that the "downstream" mucocele obstructed the "upstream" sinus, leading to formation of a secondary mucocele.

Index terms: Mucocele; Paranasal sinuses, computed tomography; Paranasal sinuses, magnetic resonance; Paranasal sinuses, mucocele

Chronic obstruction of a paranasal sinus may lead to formation of a mucocele (1, 2). A mucocele can involve an entire sinus or one air cell or compartment of a sinus (1). Most mucoceles are solitary, although multiple mucoceles have been described (3, 4).

Case Report

A 36-year-old woman reported rhinorrhea and congestion unresponsive to antibiotics and decongestants. The examining surgeon observed a proptotic right globe, of which she said she was unaware.

Her computed tomography (CT) scan demonstrated a large right ethmoid mucocele (Fig 1A) displacing the globe. This mucocele had evidently obstructed the middle meatus, because there was a second mucocele in the adjacent maxillary sinus (Figs 1B and C). The antral mucocele bulged through the posterolateral wall of the sinus, into the infratemporal fossa.

On magnetic resonance (MR) (0.5 T), the ethmoid mucocele had an intermediate signal intensity on precontrast T1-weighted images (Fig 1D), approximately isointense with brain. The maxillary mucocele was hypointense to the ethmoid mucocele.

On T2-weighted images (Fig 1E), there was no significant difference between the signal intensities of the two mucoceles.

At surgery, the maxillary mucocele was decompressed. Hanging down into the middle meatus was the ethmoid mucocele, which also was opened.

Discussion

Mucocele of the paranasal sinus is the most common expansile lesion of the sinuses (1, 2). Most (60% to 65%) mucoceles involve the frontal sinuses (1). The ethmoid sinuses (20% to 25%) are the next most common location. Most of the remainder involve the maxillary antra. Sphenoid mucoceles are rare (3).

Mucocele is the result of chronic obstruction of a paranasal sinus. Familiar causes of obstruction of a sinus ostium leading to mucocele formation include inflammatory mucosal thickening (4), nasal polyps (4), scarring from surgery (5) or prior inflammation, trauma (3), cystic fibrosis (4), an indolent neoplasm such as juvenile angiofibroma, and osteomas (3).

In the patient presented here, it appears that a *downstream* mucocele obstructed the *upstream* sinus, resulting in formation of a secondary mucocele. The large ethmoid mucocele may have been caused by inflammatory mucosal thickening. The ethmoid mucocele then obstructed the middle meatus, impeding drainage of the maxillary antrum, and a secondary antral mucocele resulted.

The signal intensities of the mucoceles on MR lend credence to this theory (6, 7). On T1-weighted images, the more hyperintense ethmoid mucocele presumably was the longer-standing of the two and contained more

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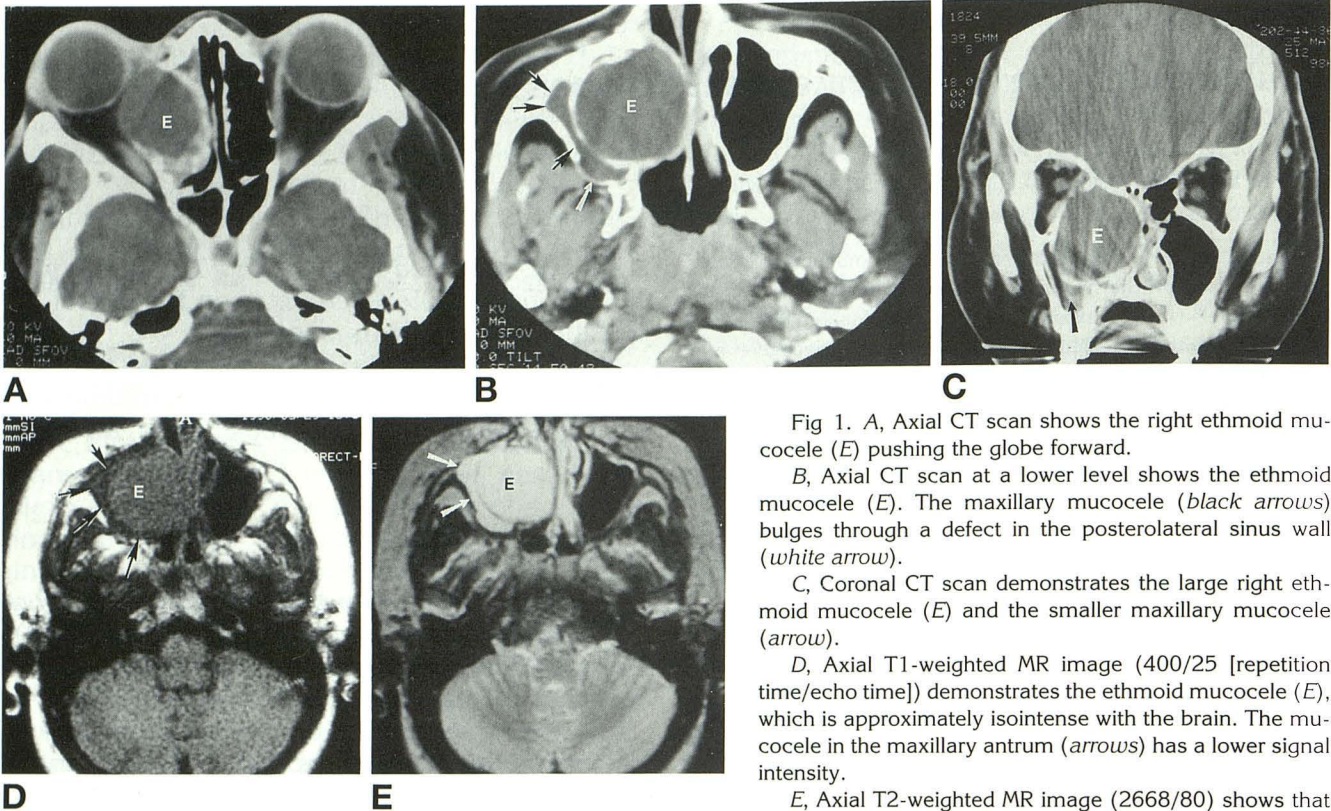


Fig 1. A, Axial CT scan shows the right ethmoid mucocele (E) pushing the globe forward.

B, Axial CT scan at a lower level shows the ethmoid mucocele (E). The maxillary mucocele (black arrows) bulges through a defect in the posterolateral sinus wall (white arrow).

C, Coronal CT scan demonstrates the large right ethmoid mucocele (E) and the smaller maxillary mucocele (arrow).

D, Axial T1-weighted MR image (400/25 [repetition time/echo time]) demonstrates the ethmoid mucocele (E), which is approximately isointense with the brain. The mucocele in the maxillary antrum (arrows) has a lower signal intensity.

E, Axial T2-weighted MR image (2668/80) shows that the signal intensities of the ethmoid (E) and antral (arrows) mucoceles are approximately the same.

desiccated, proteinaceous secretions (8). The younger maxillary mucocele contained watery material, which had a lower signal intensity. The difference in the protein concentrations of the two was insufficient to yield a difference in signal intensities on T2-weighted images (8).

The diagnosis of a double mucocele was made on the CT scan. This information enabled the surgeons to plan a procedure to address both mucoceles.

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