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# Double Mucocoele of the Paranasal Sinuses

Jane L. Weissman, Hugh D. Curtin, and David E. Eibling

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

**Index terms:** Mucocoele; Paranasal sinuses, computed tomography; Paranasal sinuses, magnetic resonance; Paranasal sinuses, mucocoele

Chronic obstruction of a paranasal sinus may lead to formation of a mucocoele (1, 2). A mucocoele can involve an entire sinus or one air cell or compartment of a sinus (1). Most mucocoeles are solitary, although multiple mucocoeles 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 mucocoele (Fig 1A) displacing the globe. This mucocoele had evidently obstructed the middle meatus, because there was a second mucocoele in the adjacent maxillary sinus (Figs 1B and C). The antral mucocoele bulged through the posterolateral wall of the sinus, into the infratemporal fossa.

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

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

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

## Discussion

Mucocoele of the paranasal sinus is the most common expansile lesion of the sinuses (1, 2). Most (60% to 65%) mucocoeles 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 mucocoeles are rare (3).

Mucocoele is the result of chronic obstruction of a paranasal sinus. Familiar causes of obstruction of a sinus ostium leading to mucocoele 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* mucocoele obstructed the *upstream* sinus, resulting in formation of a secondary mucocoele. The large ethmoid mucocoele may have been caused by inflammatory mucosal thickening. The ethmoid mucocoele then obstructed the middle meatus, impeding drainage of the maxillary antrum, and a secondary antral mucocoele resulted.

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

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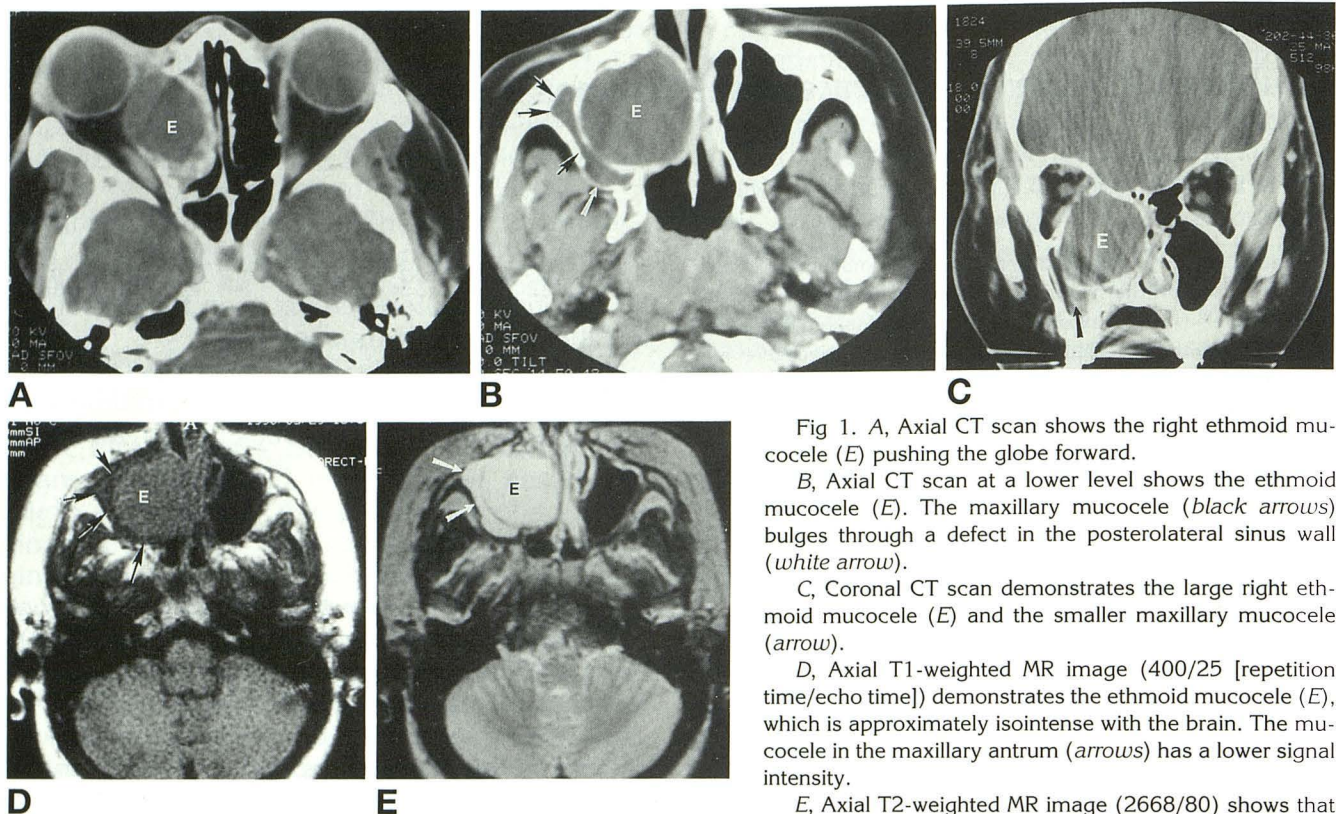


Fig 1. A, Axial CT scan shows the right ethmoid mucocoele (E) pushing the globe forward.

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

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

D, Axial T1-weighted MR image (400/25 [repetition time/echo time]) demonstrates the ethmoid mucocoele (E), which is approximately isointense with the brain. The mucocoele 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) mucocoeles are approximately the same.

desiccated, proteinaceous secretions (8). The younger maxillary mucocoele 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 mucocoele was made on the CT scan. This information enabled the surgeons to plan a procedure to address both mucocoeles.

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