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MR Imaging of Mucoceles of the Sphenoid Sinus

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Mucocele of the sphenoid sinus is a rare disorder [1–3]. Its clinical manifestations are varied, primarily reflecting the intimate anatomic relationships between the sphenoid sinus and cranial nerves II–VI, the cavernous sinus, internal carotid arteries, pituitary gland, and optic chiasm [2, 4–8].

Two patients presenting with cranial nerve deficits were evaluated with CT and MR imaging. CT showed bone destruction and opacification of all or part of the sphenoid sinus, and revealed the presence of modest contrast enhancement. MR findings consisted of slightly increased signal intensity on T1-weighted scans with marked but somewhat irregular increased signal intensity on the T2-weighted scans. Extension of the lesion outside the bounds of the sphenoid sinus into the clivus was evident in one case and led to consideration of clival chordoma as a strong differential diagnostic possibility. While CT findings of sphenoid sinus mucocele have been described [6–9], to our knowledge this is the first report of the MR characteristics of this disorder.

Case Reports

Case 1

A 29-year-old woman, 4 months postpartum, presented with deep midfacial pain of several months duration. She had no visual impairment or cranial nerve deficit. CT without and with contrast revealed extensive destruction of the sella and adjacent bony structures by a modestly contrast-enhancing mass. Plain films correlated the degree of bone destruction. T1-weighted MR imaging revealed an extensive lesion of the sphenoid sinus and clivus with slightly increased signal intensity. On the intermediate- and T2-weighted scans, the lesion showed marked irregular increase in intensity with less increase in intensity in the central aspect of the sinus. Owing to the apparent clival involvement and bone destruction, a malignancy was thought likely, and chordoma was the prime diagnostic consideration (Fig. 1).

At surgery, the anterior wall of the sphenoid sinus was noted to be markedly eroded and replaced by a fibrous membrane. When the membrane was opened, a cystic cavity was encountered and xanthochromic mucoid material, slightly purulent, was aspirated. Clival erosion was present, but the dura was intact. Bacteriologic cultures were negative. Pathology was interpreted as consistent with mucocele. Recovery was uneventful.

Case 2

A 25-year-old woman presented with several weeks history of intermittent diplopia. Although neurologic examination was grossly normal, an ophthalmologic consultant diagnosed a left lateral rectus palsy. MR imaging showed a mass lesion of the left sphenoid sinus, bright on T2, extending adjacent to the sphenoid sinus along the

pontomedullary junction. On the T1-weighted sagittal images, the lesion had only slightly increased intensity. Cerebral arteriography was normal. CT scans, with and without contrast, including thin sections through the skull base, showed mucoperiosteal thickening of the entire left sphenoid sinus with increased density of the posterior wall of the sinus extending into the clivus. The scans also showed erosion of the left side of the clivus and undercutting of the base of the dorsum sellae. The entire lesion showed modest contrast enhancement (Fig. 2).

During transsphenoidal surgery, a mucoid mass was immediately evident in the left sphenoid sinus. Microscopic examination showed acute and chronic inflammation, fibrosis, and polypoid degeneration consistent with mucocele. Subtotal evacuation was followed by an uneventful recovery.

Discussion

Between 1889 (when Berg described the first case) and 1970, only 81 cases of sphenoid sinus mucocele have been reported [3]. The occurrence of two cases at the same institution within 1 year suggests that this entity is more common than previously thought, and as a corollary, may often be misdiagnosed. MR imaging is exquisitely sensitive in detecting inflammatory diseases in paranasal sinuses, to which the often incidental finding of sinusitis attests. Bone expansion and erosion differentiate mucocele from sinusitis. Although mucocele of the sphenoid sinus is a curable disease, it may cause irreversible neurologic deficits, and it therefore should be considered in the differential diagnosis of mass lesions involving the cavernous sinus.

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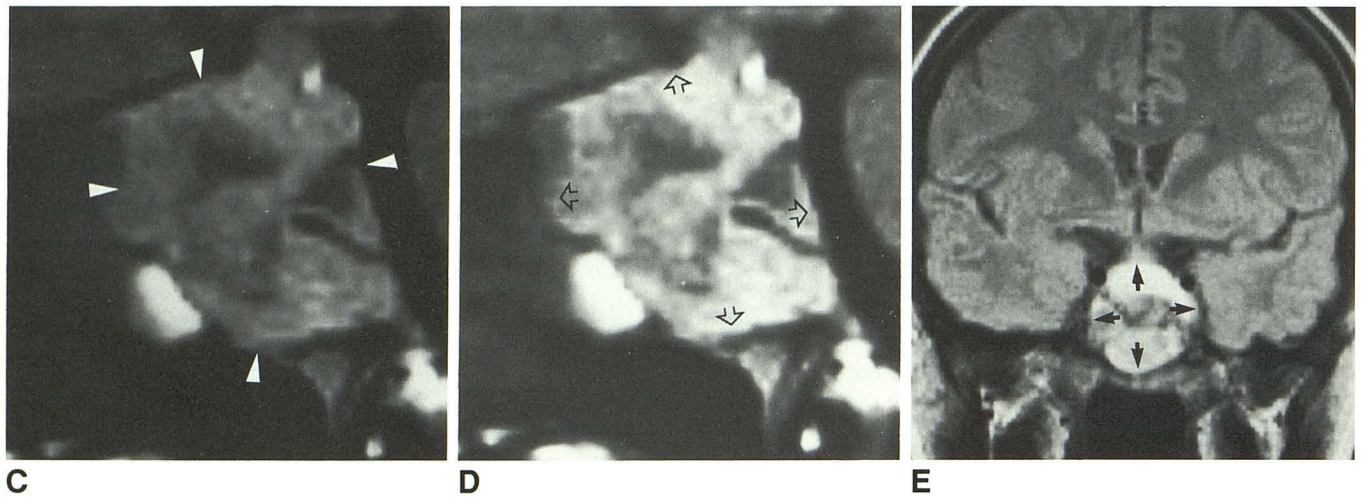
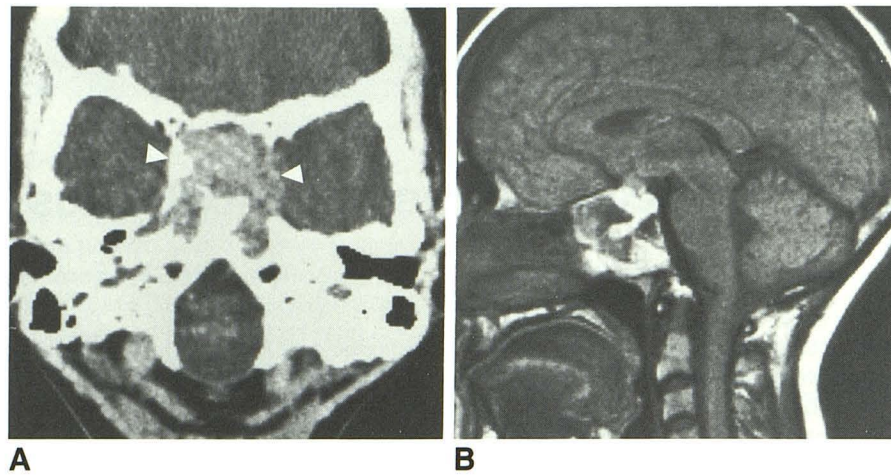


Fig. 1.—A, Axial CT scan with contrast shows modest enhancement of, and bone destruction by, mass (*arrowheads*).
 B, Intermediate T2-weighted midline sagittal MR image (1700/35) obtained on Siemens 0.35-T imager.
 C, Slightly parasagittal T1-weighted MR image (800/30) shows extensive lesion (*arrowheads*) of sphenoid sinus and clivus with slightly increased signal intensity.
 D, T2-weighted sagittal MR image (2400/80) shows heterogeneous signal intensities (*arrowheads*) within sphenoid sinus mass. Mass shows intermediate and low signal intensity on T1-weighted image and high and low signal intensity on T2-weighted image.
 E, T2-weighted coronal MR image shows similarly irregular high-T2 signal and further defines extent of mass (*arrows*). *Upper arrow* shows suprasellar extension.

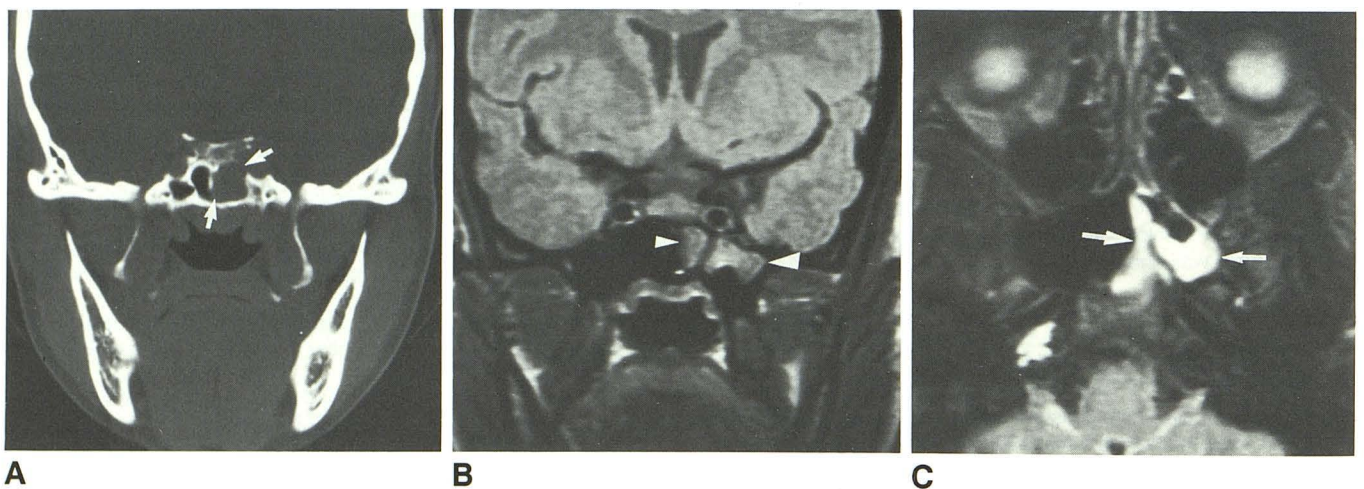


Fig. 2.—A, Coronal CT scan with bone windows shows destruction of left superolateral wall and septum of sphenoid sinus (*arrows*) by soft-tissue mass.
 B, Coronal T1-weighted MR image (800/30) shows heterogeneous but nearly isointense signal from mucocoele (*arrowheads*). (Scan was obtained on GE 1.5-T imager.)
 C, Axial T2-weighted MR image (2400/80) shows higher signal intensity (*arrows*) than seen in B.