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Osteoma of anterior cranial fossa complicated by intracranial mucocele with emphasis on its radiological diagnosis

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We present a 43-year-old female patient who had recurrent headache for one year. An intracranial bony lesion surrounded by a cyst in the anterior cranial fossa was found on imaging. Postoperative histological examination confirmed the diagnosis of osteoma and mucocele.

Key words: Anterior cranial fossa, mucocele, osteoma, surgery

Paranasal sinus osteoma accompanied by mucocele extending intracranially is rare, with less than 20 reported cases in the English literature up to now. Here we describe a case with emphasis on its radiological diagnosis.

Case Report

A 43-year-old woman presented with a one-year history of recurrent headache. Neurological findings and laboratory data were normal. The CT scan [Figure 1A] showed a bone density mass which was localized in the right anterior cranial fossa, with an intracranial and right frontal sinus extension. It was surrounded by a low-density area in the right frontal region. On MR imaging, the cystic lesion had low signal intensity

on T1-weighted, high on T2-weighted imaging [Figure 1B, C] and intense enhancement of a thin, uniform peripheral zone of tissue [Figure 1D].

The patient underwent right frontal craniotomy. Intraoperatively, a large osteoma arising from the right anterior cranial fossa with an intracranial extradural extension was found. Extradural multiloculated cysts containing yellowish jelly-like material surrounded the osteoma [Figure 2]. Histological examination of the calcified mass [Figure 3 A, B] revealed an osteoma and mucocele. The postoperative course was uneventful. Three months later the patient was doing well without headache.

Discussion

Computed tomography (CT) and Magnetic resonance (MR) imaging are both necessary for this kind of disease.^[1] CT is the preferred imaging method for evaluating osteomas. Osteomas are usually seen as a homogenous hyperdense mass. However, mucocele usually manifests as a homogeneous isodense mass, very rarely displaying lower density than the brain on CT scan. Magnetic resonance imaging is the best choice of imaging for mucocele. Signal intensities on both T1- and T2-weighted images are helpful in making

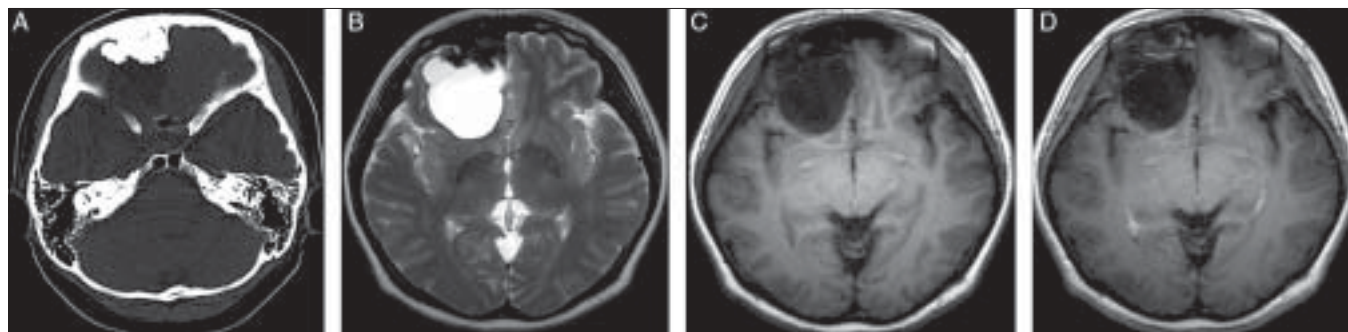


Figure 1: (A) Axial CT scan demonstrating a calcified mass localized in the right anterior cranial fossa with intracranial and frontal sinus extension. (B, C, D) MRI showing the cystic lesion is hypo-intense on T1-weighted images and hyper-intense on T2-weighted images. After contrast linear enhancement can be found along the cystic wall

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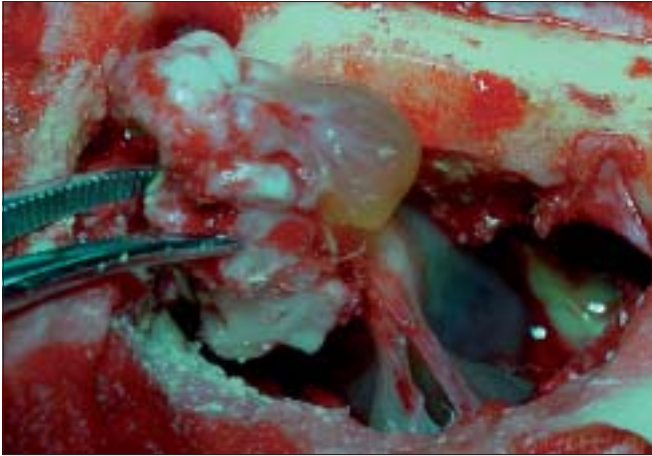


Figure 2: Intraoperative picture of the lesion

a definitive diagnosis of mucocoele. But sometimes we have difficulty in differentiating mucocoeles from neoplasms according to signal intensities. However, on enhanced MR imaging, a thin peripheral linear enhancement within the mucocoele is helpful for the accurate diagnosis of mucocoele. Magnetic resonance imaging has very limited diagnostic value for osteoma, because osteomas usually show hypo-signal intensities on both T1- and T2- weighted images and show no enhancement after administration of contrast media on MR examinations.

Differential diagnoses include various types of bone tumors, epidermoid tumor, calcified meningioma,^[2] rare extra-axial gliomas, parasite infection (cysticercosis and schistosomiasis) and post-traumatic porencephaly. Pathologically, the mucocoele can be differentiated from the intracranial endodermal cyst by its continuity with the intracranial osteoma portion or the sinus.

Total removal of the osteoma and mucocoele is necessary, with emphasis on curettage of the mucous membrane, filling the sinus and repairing the dural and bone defects to prevent recurrence and infection.^[3]

In conclusion, the knowledge of the radiological features of this entity is important for accurate diagnosis and clinical management.

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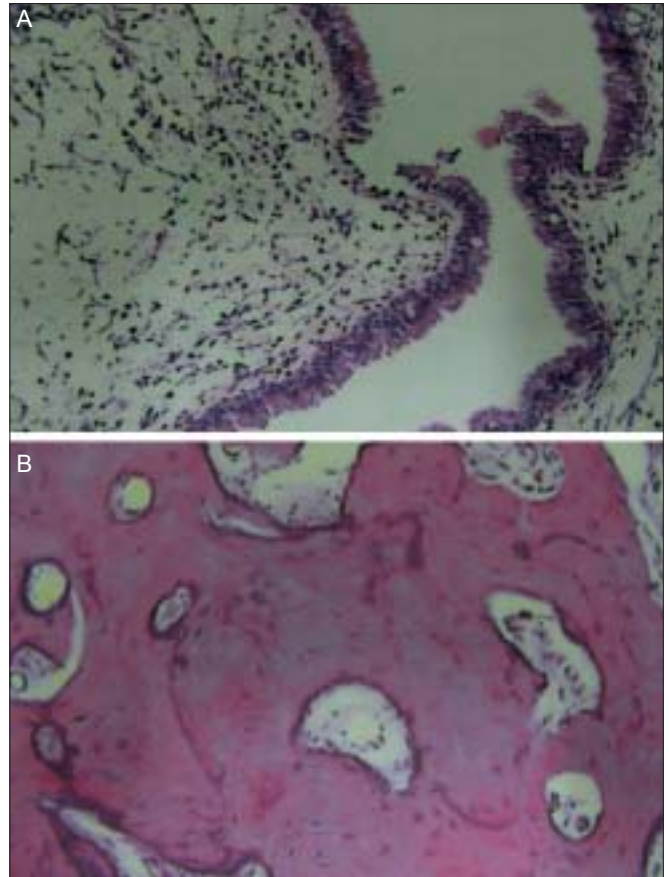


Figure 3: Microscopic view. (A) Low-power view of the cystic lesion showing the epithelium consists of pseudo-stratified, ciliated columnar cells with underlying edematous, loose fibrovascular connective tissue. (B) Low-power view of the calcified mass lesion, which consists of a dense, lamellar bone with a few medullary components. (H&E)

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