Cystic Meningioma Presenting as a Ring Lesion

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There have been numerous reports of cystic meningiomas both in the pre- and post-CT era [1–7]. The published cases of the CT appearance of cystic meningiomas usually demonstrate a cyst eccentric to the meningioma mass. We present a case of meningioma with a CT appearance of a thin-walled ring lesion.

Case Report

A 56-year-old woman presented with a 2-year history of right hemispheric focal seizures confirmed by electroencephalography. Physical and neurologic examination revealed only a mild left-central facial nerve paresis.

CT showed a cystic right parasagittal tumor with an enhancing wall (Fig. 1A). The thin wall was of varied thickness but without focal nodularity. The cystic tumor abutted the falk broadly and displaced it slightly to the left. The cyst volume was measured at 32 cm³, using the ellipsoid approximation. There was minimal edema surrounding the tumor. The CT density of the cystic part was slightly above CSF density. The CT findings were thought to be consistent with a slowly growing cystic tumor; astrocytoma was considered most likely.

At surgery, a thin-walled cystic tumor with a firm periphery was found adherent to the falk. A 20-ml sample of yellow-brown, highly proteinaceous fluid was aspirated. There was no evidence of necrosis or hemorrhage. The tumor was completely resected. The frozen section was interpreted as consistent with astrocytoma, but the permanent sections proved the tumor to be a meningioma (Fig. 1B). There was no evidence of necrosis or malignancy. After surgery the patient’s facial paresis resolved and she has been well for 2 years since her operation.

Discussion

Cystic meningiomas are rare. Cushing and Eisenhardt [8] reported only 13 cases in their series of 313 meningiomas. Sato et al. [2] reported five cases of grossly cystic tumor in a series of 420 meningiomas.

Cystic meningiomas most commonly have a cyst eccentric to the tumor mass [4–7]. These cysts have to be differentiated from adjacent edema. They are subarachnoid CSF loculations or, less commonly, true arachnoid cysts. The CSF location may be caused by mechanical trapping [9] or may be secondary to reactive gliosis [10]. The source of the cyst capsule may result from a fibroblastic or gliotic proliferation [7]. These cysts appear to be more common in the rare meningioma of infants under 1 year old [5]. Central cysts are rare [11]. Central luencies have been described with central necrosis or partial fatty replacement of the tumor [6, 7]. Their appearance, however, is quite different from that of the present case. In meningiomas with necrosis, CT shows a thick, irregular wall surrounding the central lucency [6]. A CT-lucent area can be related to old hemorrhage [6]. Hemorrhagic meningiomas may present acutely with a fresh, dense intracranial hematoma [6]. Our case does not fit either category.

The misleading pathologic diagnosis in our case may have been due to biopsy of the surrounding gliotic reaction to the tumor or to difficulty in interpreting the nonparaffin-fixed specimen. The surgeon may therefore be misled into performing a partial resection instead of the total removal called for by the benign nature of the tumor [3]. It therefore behooves the radiologist to point out the enlarged differential diagnosis of such cystic lesions. A preoperative angiogram is suggested in order to determine whether the arterial supply to the cystic mass is mainly from the external or the internal carotid artery. A cystic tumor with appropriate plain-skull radiograph changes [12] or CT findings of an unusually broad dural base are suspicious of meningioma.

In the pre-CT era, angiography would have shown the meningeal supply to these cystic meningiomas and suggested their meningeal origin. The advent of CT has radically decreased the number of angiographic examinations performed for the evaluation of space-occupying intracerebral lesions. Our case and the cases reported by Henry et al. [3] underline the possibility of both radiographic and pathologic misdiagnosis of a benign cystic meningioma.

As is well known, CT does not offer histologic diagnosis. In addition, paradoxically, the advent of CT may have decreased the accuracy of radiologic diagnosis of cystic meningioma by reducing the use of angiography in the neuroradiologic evaluation of brain tumors.
REFERENCES


Fig. 1.—A, CT appearance of cystic meningioma. Contrast-enhanced CT scan showing right frontal parasagittal ring lesion with thin enhancing wall in broad contact with falx, which is slightly displaced to left. B, Transitional type meningioma with typical meningeal whorls (H&E, x200).