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Low-density meningioma on CT.

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AJNR Am J Neuroradiol 1990, 11 (6) 1265

<http://www.ajnr.org/content/11/6/1265.citation>

This information is current as
of May 7, 2025.

Low-Density Meningioma on CT

Most meningiomas have characteristic features on CT: well-circumscribed extraaxial mass of slightly high density that shows homogeneous contrast enhancement. Some meningiomas have atypical findings on CT and are misdiagnosed as gliomas or metastasis. The most important reason for misdiagnosis based on CT findings is the nonenhancing low-density component within the tumor. Several cases of meningiomas with focal areas of low density have been reported [1–3] and have been proved histologically to be due to tumor necrosis, intratumoral cyst, hemorrhage, or fat structures. We recently observed a case of a meningioma that was of low density only and that showed marked contrast enhancement.

Case Report

A 48-year-old woman was admitted because of a generalized convulsion followed by Todd paralysis of the right upper extremity. For 2 years, she had had word-finding difficulty, like motor aphasia. She also had had a radical mastectomy 3 months before the convulsive attack. On admission, the results of neurologic and physical examinations were normal. CT scans (Figs. 1A and 1B) showed a well-circumscribed low-density (26 H) mass 4 cm in diameter at the anterior superior aspect of the left temporal fossa, slight perifocal edema and mass effect, and some compression of the ipsilateral lateral ventricle. Marked contrast enhancement was seen in this lesion along with several areas of a small unenhancing component within it.

Our initial diagnosis was metastatic tumor from breast carcinoma because of the clinical history, but the CT finding of dilated ipsilateral sylvian vallicula indicated the possibility of an extraaxial tumor. A left external carotid angiogram showed marked tumor staining with a typical sunburst appearance caused by hypertrophic branches of the middle meningeal artery. A left internal carotid angiogram showed additional supply to the mass from the recurrent meningeal branch of the ophthalmic artery. A left frontotemporal craniotomy was done, and a typical-appearing meningioma attached to the dura adjacent to the lesser wing of the sphenoid bone was excised. The cut surface showed no evidence of tumor necrosis or microcysts. Histologic examination showed it was a xanthomatous meningioma (Fig. 1C).

Discussion

Although most meningiomas have characteristic CT features, some have an unusual CT appearance and are misdiagnosed as malignant intraaxial tumors. The most common cause of atypical CT findings is the presence of low-density, nonenhancing components within the tumor, which represent tumor necrosis, cystic changes, and old intratumoral hemorrhage. Another possible explanation for the non-

enhancing low-density areas is lipomatous infiltration. Russell and Rubinstein [4] confirmed that there may be stored lipid in some meningiomas and that almost all meningiomas contain a small amount of xanthomatous material. Tans and de Jongh [5] reported three cases of minimally enhanced low-density meningiomas that contained a significant number of lipid storage cells without any cystic or necrotic changes. Sacher et al. [6] reported a case of meningioma with a focal area of low-density (–22 Hu) that was proved histologically to be fat. Russell et al. [7] reported minimal storage of fat in six of 131 meningiomas, but none of the tumors was of low density on CT scans because the amount of lipid was small. However, one of their cases was a mass that, on unenhanced CT, was of low-density only and showed nonhomogeneous contrast enhancement, which was due to extensive lipomatous transformation of a benign meningioma.

Meningiomas that are low density only and show marked contrast enhancement are quite rare. Because of the findings in our case, we think that the differential diagnosis of a tumor that has a fatty component on CT scan should include meningioma as a rare possibility. It is important to pay attention to the indirect CT signs indicating an extraaxial mass—such as inward displacement of adjacent brain surface, dilated subarachnoid space surrounding the tumor, and a broad base abutting the bone or dura mater—to make the correct diagnosis of atypical meningioma.

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Fig. 1.—Low-density meningioma.

A, Unenhanced CT scan shows a well-circumscribed low-density mass in left temporal fossa. Note dilated ipsilateral sylvian vallicula.

B, CT scan shows marked, fairly uniform enhancement after injection of contrast material.

C, Photomicrograph of pathologic specimen shows meningioma cells with xanthomatous change and extensive lipid storage in cell body. (H and E, $\times 100$)

