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LIPOBLASTIC MENINGIOMA

CASE REPORT

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ABSTRACT - We describe the case of a patient presenting a right parietal mass lesion with an heterogeneous aspect on computed tomography, with hyperdense contrast uptake areas and hypodense areas with fat density. The unusual aspect of the lesion prevented preoperative and intraoperative diagnosis. The final histopathological examination revealed a meningothelial neoplasia with adipose differentiation, characterizing a lipoblastic meningioma.

KEY WORDS: lipoblastic meningioma, metaplastic meningioma, computed tomography.

Meningioma lipoblástico: relato de caso

RESUMO - Relatamos o caso de um paciente com uma lesão expansiva parietal direita, de aspecto heterogêneo na tomografia computadorizada, com áreas hipercaptantes após a administração de contraste e outras hipodensas sugestivas de gordura. O aspecto pouco habitual da lesão dificultou o diagnóstico pré e intra-operatório. O exame histopatológico definitivo foi de neoplasia meningotelial com diferenciação adiposa, caracterizando o meningioma lipoblástico.

PALAVRAS-CHAVE: meningioma lipoblástico, meningioma metaplásico, tomografia computadorizada.

Meningiomas are benign tumors of the central nervous system (CNS) originating from meningothelial cells which are located in the cranium and spinal canal. The incidence of the tumor is higher in females and increases with age[1]. Besides the clinical picture, imaging analyses are important for diagnosis, especially computed tomography (CT) and magnetic resonance imaging. Angiography is recommended in selected cases for surgical planning. CT is highly sensitive and specific for this type of tumor; however, in approximately 7 to 15% of cases the tumor presents an atypical aspect showing areas of hemorrhage, cysts or metaplastic alterations[2]. Meningiomas characteristically present histological variants, probably due to the complex embryogenesis of the meninges[3]. The formation of mesenchymal tissue inside these tumors such as bone, cartilage and fat is known to occur and is caused by metaplasia of its cells[1]. When these alterations are significant, they characterize a variant recognized as metaplastic meningioma in the WHO's classification of tumors of the CNS[4]. This is a rare variant that can be a diagnostic problem.

We report a case that the final diagnosis was a lipoblastic meningioma. The report of this case is justified by the low incidence, diagnostic problems and therapeutic implications involved in these tumors.

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CASE REPORT

A 51-year-old white man, seen in March 1997, had been suffering from headache for 4 months and episodes of left hemiparesis of crural predominance lasting for several minutes. CT revealed an heterogeneous, right parietal parafalcine lesion, predominantly hyperdense with hypodense areas, presenting imprecise limits and irregular contours which extended from the convexity to the lateral ventricle. The attenuation coefficient in the hypodense areas was similar to that of fat. The lesion had a mass effect on the adjacent cerebral parenchyma, compressing the right lateral ventricle (Fig 1). Intravenous injection of contrast enhanced the hyperdense areas of the lesion (Fig 2).

The patient was operated on, and the lesion was found to have apparently poor-defined limits in relation to the cerebral parenchyma and not adhered to the falx. Smear preparation and frozen sections of first tissue revealed the presence of cells containing fat but was inconclusive regarding the type of lesion and degree of malignancy. The lesion was partially resected.

Final histophatological examination showed a benign neoplasia composed of meningothelial cells, with the presence of numerous mature adipose cells intermingled with meningothelial cells, some of them vacuolated, presenting transitional forms towards adipose cells (Fig 3). The pattern of meningothelial cells in the areas without adipose metaplasia characterized a meningotheliomatous meningioma. When submitted to immunohistochemistry, it was found to be positive for epithelial membrane antigen (EMA), S-100 protein and vimentin and negative for glial fibrilar acidic protein (GFAP) and neuron-specific enolase (NSE). The diagnosis was a meningioma with adipose differentiation, or lipoblastic meningioma. After this diagnosis the patient was reoperated and the lesion was completely resected, as confirmed by CT (Fig 4)

DISCUSSION

Episodic neurological deficit and headache as observed in the reported case are unusual clinical manifestation in CNS tumors. It was not clear if the transient neurological deficit was due to temporary circulatory faillure or to an epileptic phenomenon.

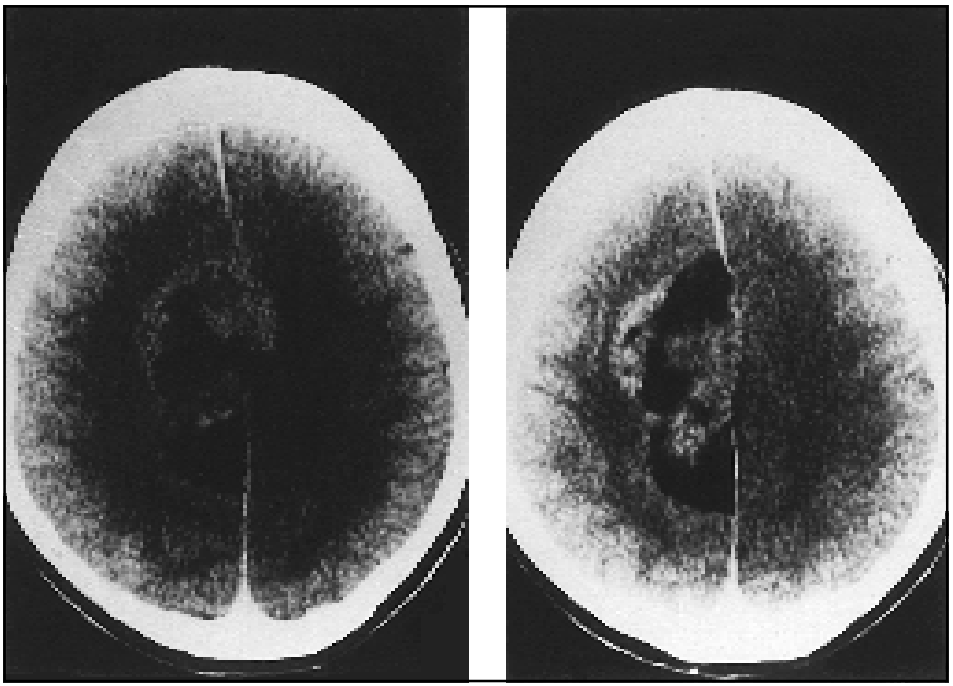

Fig 1. Unenhanced CT scans showing a parafalcine mass lesion with hyperdense and hypodense areas with attenuation coefficient of fat.

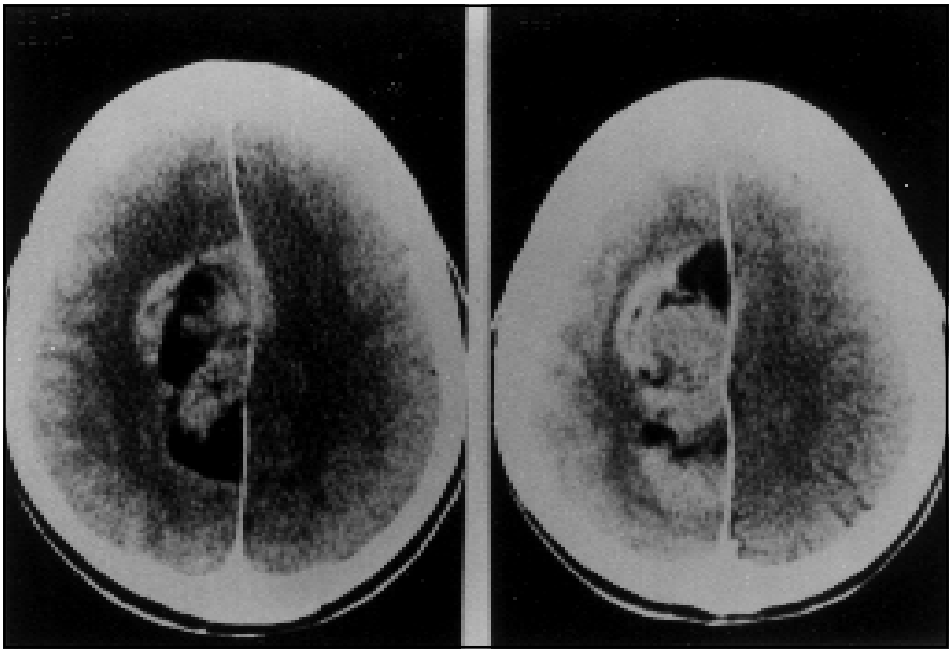

Fig 2. Contrast enhanced CT scan showing the same lesion of Figure 1 with enhancement in the former hyperdense areas.

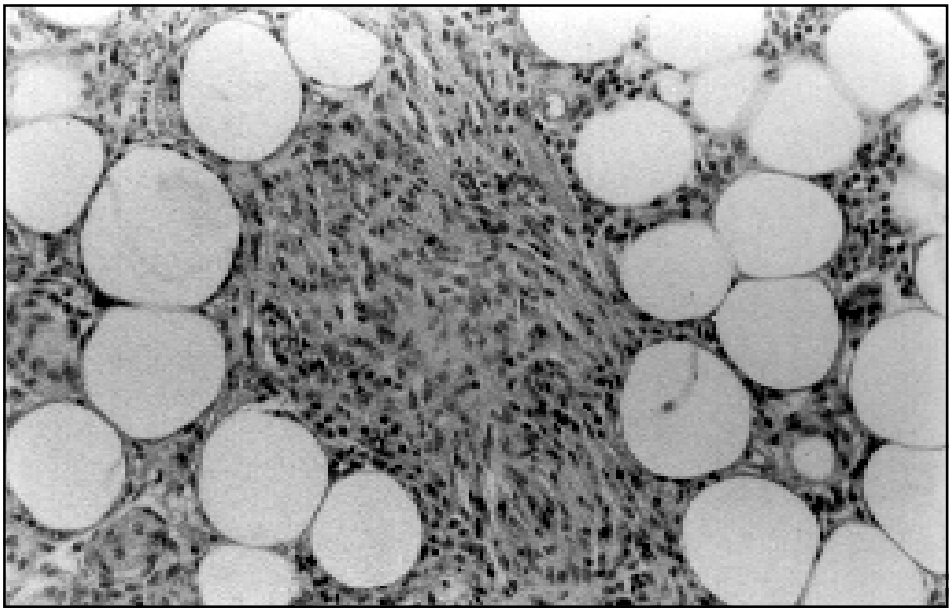

Fig 3. Histological appearance of the lipoblastic meningioma. Meningothelial cells are intermingled with mature adipocytes. Hematoxilin & Eosin x100.

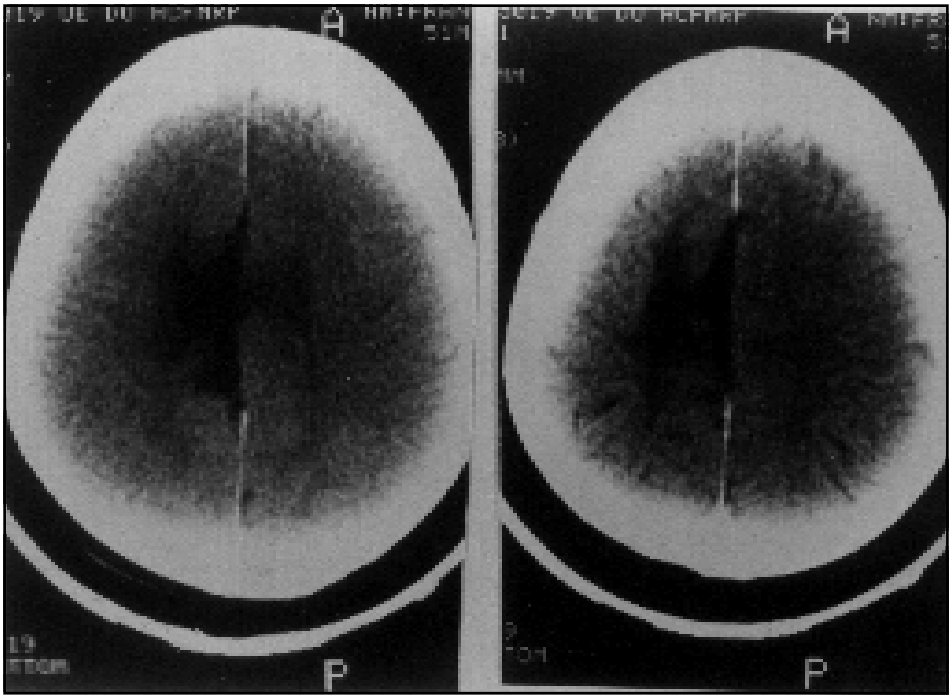

Fig 4. CT scans after surgery, showing complete removal of the lesion.

The usual tomographic feature of meningiomas is an isodense or slightly hyperdense expansive lesion in about 75% of cases, which is intensively and homogeneously enhanced after intravenous injection of contrast. Bone changes adjacent to the tumor can show hyperostosis, erosions, abnormal vascular grooves, calcifications, as well as thickening of the dura mater which is enhanced by contrast[2]. Usually, in the atypical tomographic presentation of meningiomas, areas with a low attenuation coefficient may exist, which represent cystic degeneration, tumor necrosis or an old hemorrhage[5-7], being the measurement of the attenuation coefficient, in Hounsfield units (HU) important for their differention.

In the reported case, the presence of hypodense areas and the lack of characteristic signs of a meningioma in the CT scan led to diagnostic difficulties. Areas with such attenuation coefficient of -50 to -100 HU definitely indicate the presence of fat both in the intra and extracellular space. Intracranial lesions that present areas with such attenuation coefficient are lipomas, teratomas and the two forms of meningioma, lipoblastic and xanthomatous. Lipomas usually present as homogeneous expansive lesions of well-defined limits and are located in the midline[2].

Teratomas are heterogeneous lesions with solid areas intermingled with areas with an attenuation coefficient similar to that of fat and, possibly, with rough calcifications and are also located in the midline. The lipoblastic form of meningioma cannot be differentiated from the xanthomatous form only by its tomographic aspect[2].

Although rare, both forms should be considered in the deferential diagnosis of intracranial extra-axial lesions with hypodense areas.

The common surgical presentation of meningiomas is a well-defined lesion with solid consistency in relation to the parenchyma. In the reported case, the presence of fat at the periphery of the tumor prevented the identification of the neoplasm as a meningioma during surgery.

The adipose form is one of the metaplastic differentiation of meningiomas called lipomatous meningioma[1,5,8]. lipoblastic meningioma[1,8,9] lipomeningioma [10] or vacuolated meningioma[9]. This variant is an uncommon entity, in spite of the frequent occurrence of meningiomas, and is considered to be a benign one. Investigators agree that this term should be applied when a large part of the tumor consists of adipose cells; in the present case this fact was observed to such an extent that adipose cells predominated in the smears and frozen sections and only a few meningothelial cells were present, which was a problem for the diagnosis. In the histological examination of further tissue, typical areas of meningioma confirmed by immunohistochemical examination were found, as well as adipose cells, which allowed the final diagnosis. The adipose component reflects metaplastic alterations of meningothelial cells in mature adipocytes. These cells are similar to the adipocytes that exist at any other site in the body and consist mainly of triglycerides. This variant should be differentiated from the xanthomatous variant of meningioma whose cells with centrally located nuclei contain an enormous amount of small fat vacuoles, frequently cholesterol [8,11,12].

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