

# Lipomatous Meningioma: Report of a Case and a Diagnostic Pitfall

## Lipomatöz Menenjiom: Bir Olgu Sunumu ve Tanısal Güçlük

### ABSTRACT

Fat storage in a meningioma occurs via two distinct processes: metaplastic change of meningotheiomatous cells into mature adipocytes, or microcystic change and lipidisation of meningioma cells. We report a case of a true metaplastic "lipomatous" meningioma. Differentiation of two distinct types of meningioma lipidisation and their differential diagnosis from other fat-containing pathologies such as liposarcoma, mucinous cell carcinoma, dermoid and epidermoid tumors are discussed with special reference to the presented case.

**KEY WORDS:** Lipomatous meningioma, Lipoblastic meningioma, Lipidised meningioma, Metaplasia, Adipose tissue

### ÖZ

Menenjiomlarda yağ depolanması farklı iki yol ile olur. Meningotelyomatöz hücrelerin matür adipositlere metaplastik değişimi veya meninjioma hücrelerinin mikrokistik değişimi ya da lipidizasyonu. Bu yazıda biz gerçek bir metaplastik "lipomatöz meninjioma" olgusu sunduk. Bu sunuda iki farklı tip menenjioma lipidizasyonunun ayırımı ve bunların liposarkom, musinöz hücreli karsinom, dermoid ve epidermoid tümörler gibi diğer yağ depolayıcı lezyonlar ile ayırıcı tanısı tartışılmıştır.

**ANAHTAR SÖZCÜKLER:** Lipomatöz menenjiom, Lipoplastik menenjiom, Menenjioma Lipidasyonu, Metaplazya, Adipose tissue.

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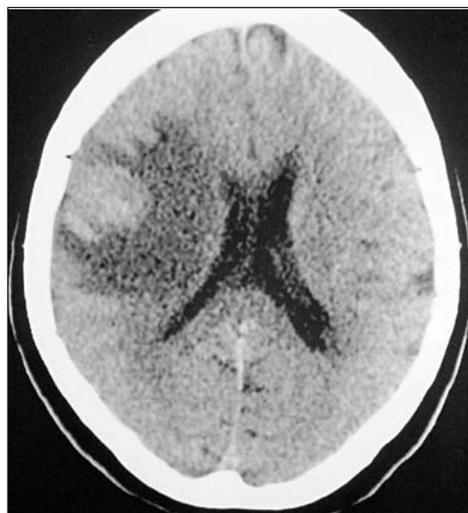
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## INTRODUCTION

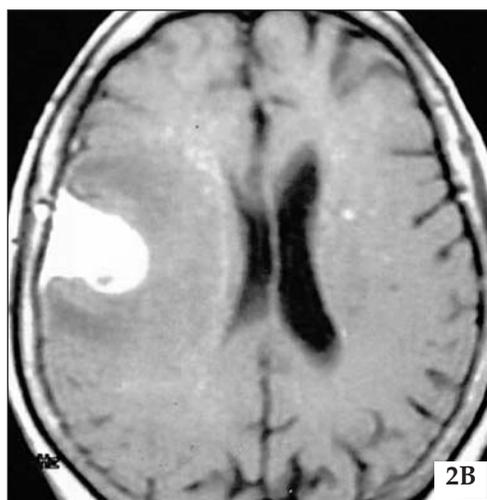
Meningiomas represent approximately 15% of all intracranial tumors (2,4,6). Lipomatous meningioma is a rare variant, and fat within meningiomas causes difficulty in histological diagnosis (3,5). It should be identified whether this fat is simply a storage phenomenon, or belongs to metaplastic change of some cells. Differential diagnosis with some fat-containing tumors like liposarcomas, lipomas, epidermoid and dermoid tumors, chordomas, metastatic mucinous carcinomas should also be done, since each requires a different specific treatment. We discuss the difficulties in histological and differential diagnosis with special reference to the reported case. The confusion created by terms such as lipomatous, lipoblastic and lipidised in the literature is emphasized.

## CASE REPORT

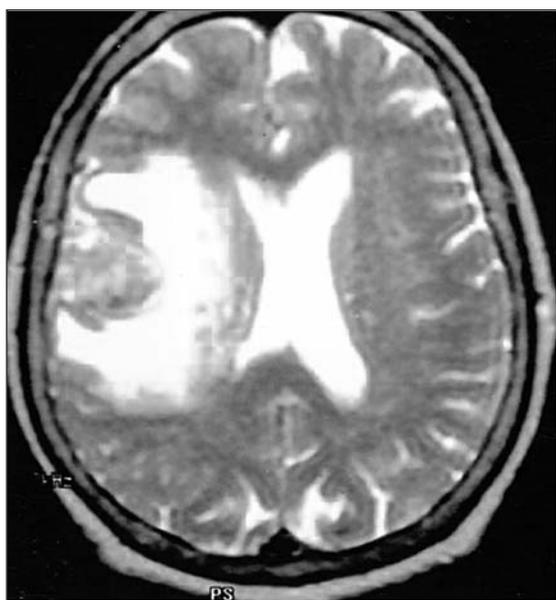
A 65-year-old woman suffering from seizures was admitted to our clinic with a complaint of focal seizures for 3 weeks. Neurological examination revealed slight paresis and increased deep tendon reflexes in the left lower extremity. Contrast enhanced computed tomography (CT) showed an extraaxial mass lesion in the right frontoparietal area with surrounding edema. The mass was homogeneously enhancing and hyperdense (Figure 1). T1-weighted magnetic resonance (MR) images showed a 2.5x3 cm. iso-hypointense mass (Figure 2A). MR images confirmed the fatty appearance of this lesion. After gadolinium injection, the tumor was homogeneously hyperintense on T1-weighted images (Figure 2B). The mass was seen heterogeneously hypo-isointense on T2-weighted MR image (Figure 3). The patient was operated on by a right frontoparietal craniotomy. The tumor had good cleavage and was easily removed. Macroscopically, the mass was completely avascular and bright yellow in color. Histologically, the tumor consisted of typical meningotheliomatous meningioma cells mixed with mature adipose tissue (Fig. 4). The tumor cells consisted of spindle cells with uniform small, oval nuclei. The adipose tissue was composed of cells with variably sized clear circular outlines, with a thin rim of cytoplasm and a small-flattened nucleus located peripherally in the cytoplasm.



**Figure 1:** Contrast enhanced axial CT scan revealed a right frontoparietal mass lesion and surrounding edema.



**Figure 2:** A Axial T1-weighted MR showed a iso-hypointense tumor with peripheral edema. B: The tumor is seen homogeneously hyperintense with contrast medium.



**Figure 3:** Axial T2-weighted MR image showed heterogeneously hypo-isointense mass lesion and intense surrounding edema.



**Figure 4:** Meningeothelial cells admixed with mature adipocytes are seen. (HE X 200)

### DISCUSSION

Meningiomas make up about 15% of intracranial mass lesions (2,4,6). They derive from arachnoidal cap cells. The pathology of meningiomas varies. Fat and fat-containing cells are rarely found in meningiomas (1,2,5,6,8). Microscopically there are two distinct types of fat storage in a meningioma (2,5). If a large proportion of the tumor is composed of mature adipose tissue, this is a metaplastic change, and the terms "lipomatous" or "lipoblastic" are appropriate for this type of tumor. The pluripotential mesenchymal cells, from which meningiomas arise, may undergo gradual transformation into other cell types. This process

reflects metaplastic differentiation of meningotheiomatous cells into mature adipocytes. The cytoplasm is filled with a large fat droplet and the nucleus is placed peripherally. These fat droplets are composed mainly of triglycerides (2,3,5). The second type of fat storage is seen in some variants of meningioma, especially in the xanthomatous variant. There are cells containing numerous small vacuoles of fat, often composed of cholesterol or glycogen, with a centrally located nucleus. This variant reflects a simple storage phenomenon, so the term "lipidised" is suitable for it. This variant is considered humid or microcystic (3,5). These terms have been used in all meningiomas that show lipid accumulation in the medical literature (1,5,6). Our case revealed meningotheiomatous cells mixed with mature adipocytes prompting the histological diagnosis of true lipomatous meningioma. This differentiation has no prognostic significance (5). Although all the fat-containing meningiomas behave as ordinary meningiomas, the reason for the rapid progression of symptoms in our case is probably related to development of the surrounding edema which is unrelated to fatty degeneration. Differentiation of the lipid-containing meningioma from malignant entities has a paramount importance because their treatment modalities are different from meningiomas.

Lipomas are the other maldevelopmental lesions. There is a variable amount of collagen of uneven distribution within a lipoma. Lipomas are usually found at or near the midsagittal plane, especially over the corpus callosum (7). Lipid storage occurs within some malignant tumors such as metastatic mucinous carcinomas, giant-cell glioblastomas, pleomorphic xanthoastrocytomas and some glioblastomas.

In summary, lipomatous or lipoblastic meningioma variant is a distinctive metaplastic neoplasm, but differentiation from lipidised meningiomas has no prognostic or clinical importance (2,5). Distinction between the two entities is theoretical rather than practical.

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