Atypical Intracranial Lipomatous Meningioma

A 65-year-old woman presented with headaches and vertiginous syndrome for two years. She therefore underwent brain CT and MR imaging.

Imaging Findings:

This patient presented symptomatology of headaches and vertiginous syndrome lasting for two years. She was being treated for hypertension and osteoporosis. Neurological examination revealed discrete left dysmetria and no other neurological abnormalities were detected. Computed tomography scan of the brain disclosed a left posterior fossa lesion, well defined, which had an anterior component with low density, approximately – 80 HU and a posterior component which showed slight enhancement after contrast. Magnetic resonance imaging (MRI) of the brain at 1,5 Tesla confirmed a left posterior fossa lesion, apparently extra axial, grossly round, approximately 3,7X 3,2X 3,0 cm in greatest diameters. The lesion was slightly heterogeneous, predominantly hyperintense on all pulse sequences, mostly in its anterior component. After gadolinium injection there was an enhancement of the posterior component of the lesion like in the brain CT scan. There was no associated edema but a discrete mass effect including mild deformation of the fourth ventricule, which was patent. MR angiography did not show associated vascular lesions especially any involvement of the adjacent lateral sinus.

Discussion:

The left posterior fossa mass seemed to be extra axial and had an anterior component compatible with fat (presented low attenuation on CT approximately – 80 HU and hyperintensity on all pulse sequences including T1 and T2 FSE). The usual CT imaging of meningiomas is an isodense or slightly hyperdense expansive extra axial lesion in about 75% of cases, which exhibits a moderate to intense and homogenous enhancement after contrast. In meningiomas that present areas with low attenuation coefficients, those areas could show presence of fat (attenuation coefficient of -50 to -100 HU), cystic degeneration or more rarely tumor necrosis or an old hemorrhage. In our case the lesion showed a hyper signal intensity on T1 mostly in its anterior component and also slight hyper signal intensity on long TR sequences (FSE). After that it should be considered in the differential diagnosis lesions with the presence of: fat (meningioma variant, lipoma, teratoma, dermoid/epidermoid), methemoglobin, paramagnetic substances like melanin, manganese, calcium. The correlation of all features including location, morphology and CT and MRI findings of the lesion allowed that the diagnosis of lipomatous meningioma was made preoperatively. Macroscopic complete resection of the tumor was performed and histologic examination of the surgical specimen revealed areas of adipose metaplasia intermingled with clusters of arachnoid cap cells. In some
areas of the tumor there were increased mitotic rates with four or more mitoses per 10 high power fields (HPF). The Ki-67 index value was 13.0%. With these data, a histologic diagnostic of atypical meningioma with adipose metaplasia (WHO grade II) was established. The meningiomas are quite frequent being almost 15% of the intracranial tumors; 8 to 10% of those are located in the infratentorial region. The lipomatous meningioma represents a rare histological variant and may be applied where a (variable) proportion of the tumor is composed of adipose tissue. The term lipomatous meningioma is considered to reflect metaplastic change of meningoepithelial cells into adipocytes and/or lipoblastic-like cells, by the 2007 World Health Organization Classification of the Tumors of the Nervous System. Though some authors have proposed the term “lipidized meningiomas” since the neoplastic cells resembling mature adipocytes or lipoblasts retained the immunohistochemical and ultrastructural features of meningotheelial cells and lacked specific features of true adipocytes. It seems that this histological variant do not result from true metaplasia and rather lipid accumulation in meningiomas, which appears to result from a metabolic abnormality of the neoplastic cells. We report a case of an intracranial lipomatous meningioma WHO grade II, emphasizing the fact that immunohistochemical staining with Ki-67 correlates with tumoral recurrence and predicts clinical outcome in patients with atypical or anaplastic meningiomas. The labeling index >4.4% is estimated of a 32% recurrence free at 6 years. In our case this labeling index was 13.0% and the MRI performed 1 year after the surgery did not show signs of recurrence, but this follow-up is too short and further vigilance is warranted.

**Differential Diagnosis List:** Atypical (WHO grade II) lipomatous meningioma with histopathologic confirmation

**Final Diagnosis:** Atypical (WHO grade II) lipomatous meningioma with histopathologic confirmation

**References:**


Description: Unenhanced CT (A) and Contrast–Enhanced CT (B) disclosing a left posterior fossa lesion with an anterior component markedly hypodense (-80 HU) and a posterior component which is slightly enhanced after contrast. Origin:
Description: Unenhanced CT (A) and Contrast –Enhanced CT (B) disclosing a left posterior fossa lesion with an anterior component markedly hypodense (- 80 HU) and a posterior component which is slightly enhanced after contrast. Origin:
Description: Axial T1 (A) and T2 (B) images showing the extra axial and predominantly hypertense mass. Origin:
Description: Axial T1 (A) and T2 (B) images showing the extra axial and predominantly hypointense mass. Origin:
Description: Axial (A) and sagittal (B) T1-weighted images after gadolinium injection demonstrating mild enhancement of the posterior component of the lesion. Origin:
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Figure 4

**a**

Description: hematoxylin and eosin preparation, x 200, demonstrating the characteristic features of meningioma admixed with cells resembling mature adipocytes. **Origin:**

**b**

Description: hematoxylin and eosin preparation, x 400, showing the meningothelial cells with some mitotic figures present. **Origin:**
Description: Ki-67 immunostaining, x 200, the nucleus that express Ki-67 are labeled and appear with brown coloration. Origin: