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Contribution of MRI in the Diagnosis of Meningiomas: About a Case

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Abstract **Case Report**

Meningiomas represent 15 to 20% of intracranial tumors. We report a case of supratentorial meningioma, and outline the characteristics of these lesions as well as the diagnostic problems they may pose. Currently, MRI is the examination of choice for the diagnosis of these tumors thanks to multiplanar acquisitions, the absence of artifacts and the excellent tissue characterization.

Keywords: MRI - Extra-axial tumor - Meningiomas.

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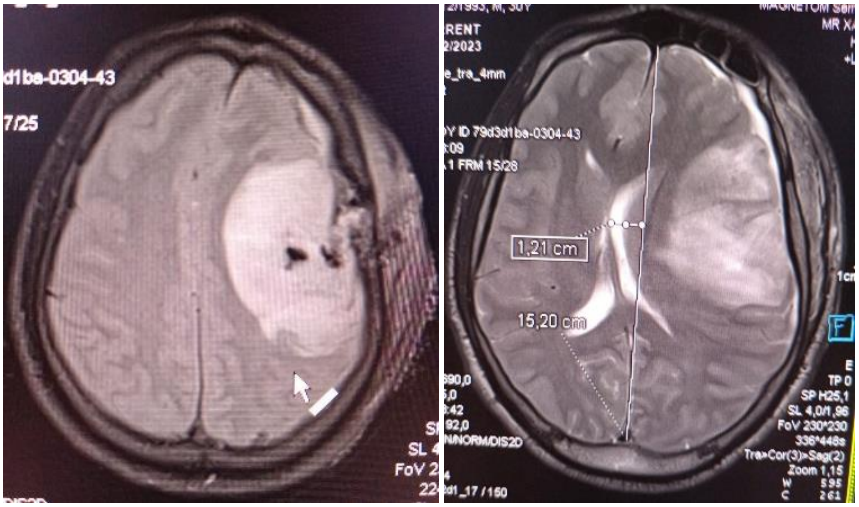
INTRODUCTION

Meningiomas usually appear as extra-axial, well-defined tumors that lie largely on the dura mater and compress adjacent brain tissue. MRI (Magnetic Resonance Imaging), usually performed with Gadolinium injection, to visualize the positive diagnosis and to study the lesion relationships in order to achieve an excellent preoperative assessment. Then, postoperatively, MR allows monitoring of possible tumor remnants or recurrence. We report the case of a patient in whom MRI allowed the diagnosis to be made, and we will report through this observation the MRI aspects of this pathological entity.

OBSERVATION

A 56-year-old woman, without significant pathological history, who consulted for epileptic seizure, with progressive headache and blurred vision. MRI (Figure 1) objectified an extra-axial lesion process whose morphology and signal abnormality suggestive of a meningioma, exerting a mass effect on the midline and the ventricular system, associated with an enhancement of the adjacent meninges after injection of Gadolinium.



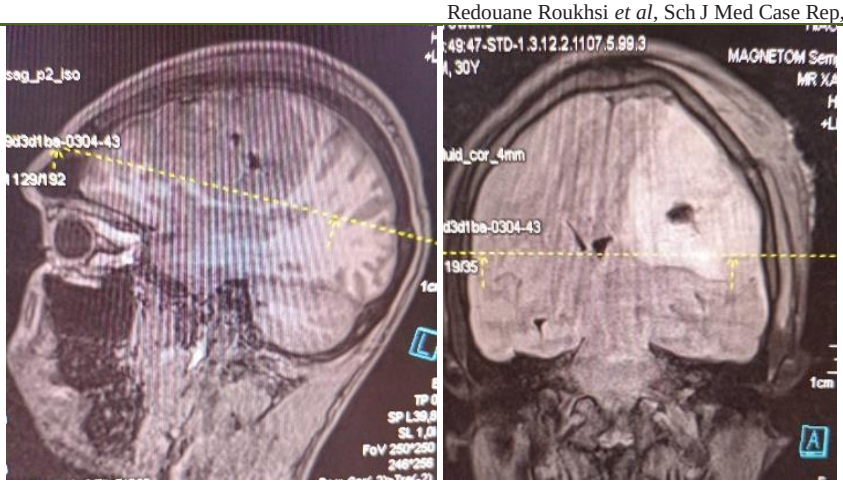


Figure 1: MRI in T1, T2 and T2 Flair sequence, in axial, coronal and sagittal section showing the MRI appearance of the meningioma which appears as a slightly hypointense extra-axial mass in T1 weighting, strongly hyperintense in T2

DISCUSSION

Meningiomas are the most common non-glial intracranial primary tumors [1]. The most common extra-axial tumor, originates from meningothelial cells [2].

This is an extra-axial lesion that is wider than thick, with a broad base of dural meningeal implantation, with an isointense or slightly hypointense signal in T1. While in T2 and FLAIR approximately 50% of these lesions are isointense and 50% hyperintense compared to the cerebral cortex, with dilated nutrient arteries in a radial arrangement, and intense and homogeneous enhancement after injection [2, 3].

The presence of perilesional edema in 50% of cases, particularly in angiomatous forms. The ADC is variable, often high, if the lesion is atypical or aggressive: it presents as diffusion hypersignal with decreased ADC.

The perfusion sequence demonstrates hyperperfusion without return to baseline (absence of blood-brain barrier with significant extra-capillary leakage of iodinated contrast product).

For spectroscopy, it demonstrates a classic tumor profile with a peak of Choline and myoinositol, an increase in the Cho/Cr and Cho/NAA ratio, associated with an alanine peak inconsistently [3].

In our case the appearance of the tumor was so typical morphologically and the signal anomalies as well as the shrinkage of the mass effect on the paresnchyma, thus showing the importance and diagnostic value of magnetic resonance imaging for the management of meningiomas. Meningiomas have 3 grades according to the WHO, with increasing evolutivity:

- Grade I: Meningothelial, fibroblastic, angiomatous, psammomatous, microcystic, secretory, transitional
- Grade II: Atypical, clear cell, choroid
- Grade III: Anaplastic or malignant, rhabdoid, papillary

The differential diagnosis is with Hemangiopericytoma (absence of calcifications, absence of hyperostosis), with solitary fibrous tumor (rare calcifications), dural or leptomeningeal metastasis (rCVB = 1-3 unless metastasis of renal cancer or melanoma or the rCBV is equivalent to that of meningiomas), and with dural lymphoma (no hyperperfusion).

Vascular intervention, such as cerebral angiography, plays a key role in diagnosis, and embolization preoperatively if highly vascular.

Treatment can be surgery with embolization, or radiotherapy if sphenocavernous meningioma, recurrent, postoperatively if grade II or III [2-4].

CONCLUSION

MRI is the gold standard for the diagnosis of meningioma. Other imaging tests such as CT scan and PET scan can also be used to refine the diagnosis. MRI monitoring is often sufficient due to the slow progression of meningioma.

Conflict of Interest: The authors declare that they have no conflict of interest.

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