



## PTERIONAL MENINGIOMA: A CASE REPORT AND CLINICAL DISCUSSION

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### ABSTRACT

Meningioma is characterized as an abnormal meningeal growth from the arachnoid-mater that is usually benign. It is among the most common primary intracranial neoplasms and can be found in 1%-2.3% of autopsies. Despite that, the surgical treatment for meningioma is still a challenge, as it depends on the size of the tumor and its relation with structures such as the cranial nerves. When symptomatic, it can cause severe headache, visual disturbances, exophthalmia, and cerebellar dysfunction although it depends on the location of the meningioma. In the present paper we aim to report the case of a 56-year-old woman that was diagnosed with meningothelial meningioma of the pterion.

**KEYWORDS:** Meningioma; Meningothelial Meningioma; Pterional Meningioma; Pterion.

### INTRODUCTION

The meninges are layers which overlay the central nervous system and function as a protective barrier while also giving it nutrition. The meninges are divided in three layers: dura-mater – the most outer layer; the arachnoid-mater – the middle layer; and the pia-mater – the most inner layer. Essentially, the cerebrospinal fluid flows between the arachnoid and the pia-mater.<sup>[1]</sup>

Meningiomas are characterized as abnormal growths of the arachnoidal cap cells. Often benign, the meningiomas represent roughly 15%-20% of all primary brain neoplasms and are known to affect women in a 2:1 proportion in comparison to men.<sup>[2,3]</sup>

Treatment is in accordance with its grade: usually, benign tumors are only monitored and surgery is performed whenever symptoms start to arise, while a more malignant tumor may need not only surgery, but chemotherapy or radiotherapy as well.<sup>[4,5]</sup>

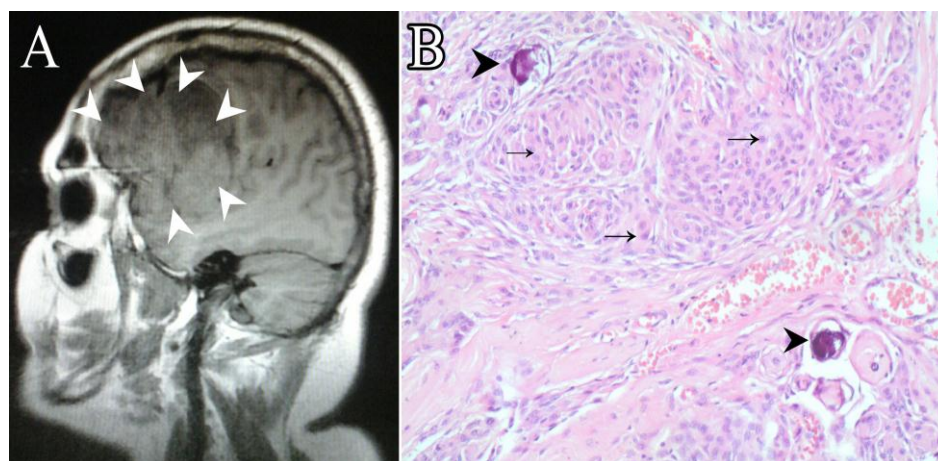
We aim to report the case of a meningothelial meningioma located at the pterion in a 56-year old female patient.

### CASE STUDY

A 56-year old female went to our emergency with complaints of frequent and painful headaches. The patient denied diabetes and hypertension, although she had recently ceased smoking habits. The patient was initially medicated with intravenous Metamizole and monitored.

The pain did decrease, although it returned four hours later. The patient was submitted to magnetic resonance imaging of her head. Diagnosis of a large pterional meningioma was promptly made (Figure 1, A) and the patient opted to remove it. There were no involvement of the optic nerve and there was no diplopia, which indicated that the tumor was not malignant, albeit large.

Resection surgery was performed and the patient had an uneventful recovery. Histological analysis (Figure 1, B) showed that the meningioma was meningothelial and was of grade I, according to the WHO.



**Figure. 1. RMI of the meningioma (A); Histopathological findings of the pterional meningioma (B).**

Legend: (A) White arrowheads depicting the pterional meningioma; (B) Black arrowhead depicting psammoma bodies and black arrows displaying the syncytial organization of the tumor cells.

**Table. 1: Classification of meningioma according to the World Health Organization.<sup>[6]</sup>**

Grade I	Grade II	Grade III
Meningothelial meningioma	Metaplastic meningioma	Papillary meningioma
Fibrous (fibroblastic) meningioma	Chordoid meningioma	Rhabdoid meningioma
Transitional (mixed) meningioma	Clear cell meningioma	Anaplastic meningioma
Psammomatous meningioma	Atypical meningioma	-
Angiomatous meningioma	-	-
Microcystic meningioma	-	-
Secretory meningioma	-	-
Lymphoplasmacyte-rich meningioma	-	-

## DISCUSSION

The primary meningeal layer is embryologically derived from the neural tube and a layer of mesenchymal tissue that envelops. This layer suffers a differentiation process and divides into two: the pachymeninges (dura-mater) and the leptomeninges (which comprises both the arachnoid and pia mater).<sup>[1,2]</sup>

However, it is important to remind that the spinal portion of the meninges possess a different development – the paraxial mesoderm. A similar to other mammals.<sup>[1,2]</sup>

Harvey Cushing first introduced the term “meningioma” in 1922, although early historical reports dates back to 1614, when Felix Plater, a Professor of Medicine, performed the autopsy of Caspar Bonecurtius, a noble knight. Plater was the first to describe a lesion quite similar with a meningioma, however, the doctor did not name it.<sup>[2]</sup>

Nonetheless, archeological researchers discovered “The Steinheim skull”, stratigraphically dated at 365,000 years old – the most earlier record of meningioma in the Homo erectus line.<sup>[2]</sup>

This ailment is usually diagnosed as an incidental finding since only a handful of patient experience symptoms such as edema, headache, visual disturbances or cerebellar disturbance. Furthermore, the World Health Organization (WHO) classifies the meningiomas

according to their malignancy and histological aspect, there are currently three grades: I, II and III with the latter being coined as anaplastic meningioma (short recurrence free intervals and high mortality rates) (Rogers *et al.*, 2015). The classification according to the WHO<sup>[6]</sup> is shown in Table 1.

Furthermore, the meningiomas may be classified by its site (e. g. foramen magnum meningioma, petroclival meningioma, frontal lobe meningioma) and histological aspect (e. g. meningothelial, angiomatous, metaplastic) (Lee, 2009; Tang *et al.*, 2013).

Histologically, the meningothelial meningioma (also known as syncytial or meningotheliomatous meningioma) is the most common variant of meningiomas. It is characterized as an arrangement of tumor cells in lobular nests with poor cytoplasmic borders and the cells are arranged in a syncytium fashion. Furthermore, they resemble arachnoidal cap cells from whence these tumors arise.<sup>[2]</sup>

Since they are often benign, the meningiomas barely produce clinical symptoms. Despite that, in cases of malignancy, they may cause severe conditions such as headaches, visual disturbances, nausea and vomiting, seizures, visual impairments (diplopia), hemiparesis, mood changes and confusion, depending on the affected region.<sup>[7]</sup>

**CONCLUSION**

In conclusion, meningiomas are a common condition and usually benign, although it should not be discarded as a differential diagnosis in patients with headaches, diplopia and other neurological symptoms, as it can become aggressive and affect significant segments of the central nervous system. Furthermore, grading of the tumor is essential in order to predict the course of action and prognosis.

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