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Spheno-Orbital En Plaque Meningioma: A Case Report and Literature Review

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Abstract | **Case Report**

En plaque meningioma is an uncommon variant of meningioma marked by flat, sheet-like growth along the dura and prominent reactive bone hyperostosis, most often affecting the spheno-orbital region. We describe a 63-year-old patient with no significant medical history who presented with two years of headaches, declining right-eye vision, a firm right temporal swelling, and ipsilateral exophthalmos. Computed tomography (CT) of the brain and temporal bone showed an aggressive, mixed lytic and expansile lesion centered on the right greater sphenoid wing and temporal bone with spiculated margins and a large heterogeneously enhancing soft-tissue component ($76 \times 62 \times 68\text{mm}$). The tumor invaded the right orbit—producing grade III exophthalmos—along with the sphenoid sinus, pterygoid process, superior orbital fissure, petrous bone, and infratemporal fossa, causing notable mass effect and subfalcine herniation. Subsequent magnetic resonance imaging (MRI) demonstrated bone widening with T1/T2 isosignal, thick enhancing dural involvement ($41 \times 24 \times 35\text{mm}$), frontoparietotemporal edema, and a 15 mm subfalcine shift, strongly supporting an aggressive spheno-orbital en plaque meningioma. Pairing CT for osseous detail with MRI for dural and brain assessment remains vital for timely diagnosis and surgical planning.

Keywords: En plaque meningioma, Spheno-orbital region, Bone hyperostosis, Greater wing of sphenoid, Temporal bone, Dura mater, Neuroimaging.

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INTRODUCTION

En plaque meningioma is a distinct clinico-pathological entity characterized by horizontal, sheet-like growth spreading along the dura mater, contrasting with the classical nodular mass form of typical meningiomas. Frequently located in the spheno-orbital region, it is markedly associated with reactive bone hyperostosis. We report the radiological and clinical observation of a patient managed for an extensive tumor process involving the greater wing of the sphenoid and the temporal bone.

CLINICAL CASE

History and Clinical Examination

The patient is a 63-year-old individual, with no notable medical history, presenting with an incomplete syndrome of intracranial hypertension (headaches, decreased visual acuity in the right eye) evolving for two years, associated with a firm right temporal swelling with homolateral exophthalmos.

Imaging Workup

Brain and Temporal Bone Computed Tomography (CT)

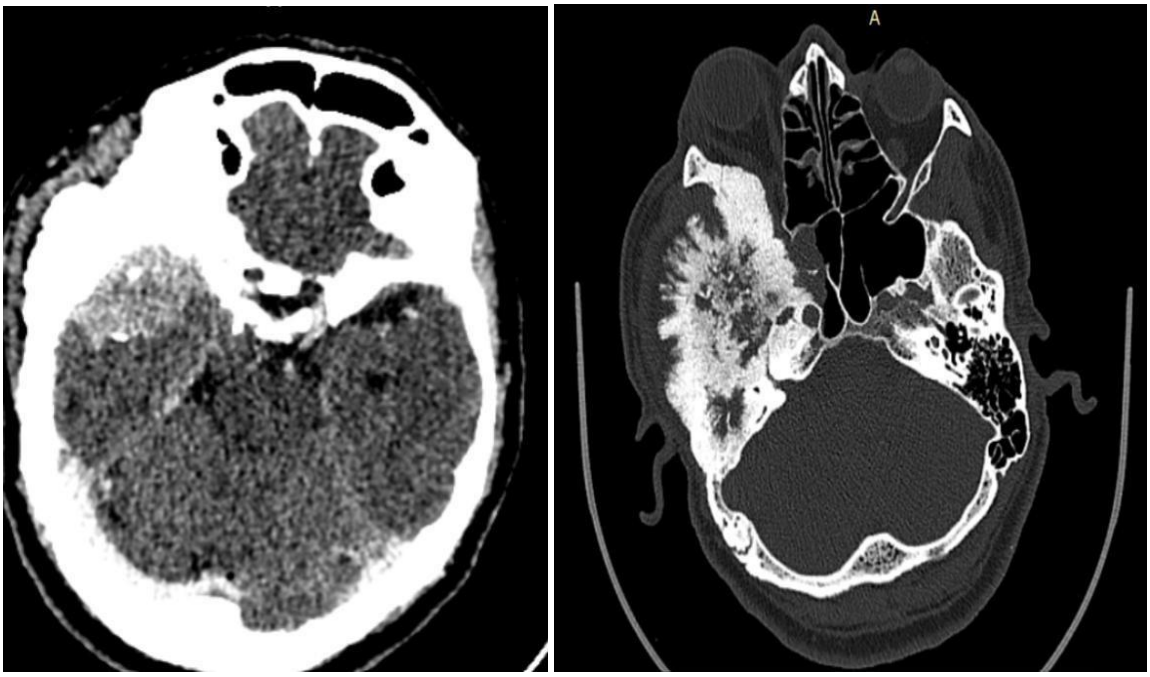
- **Lesion:** A lesion centered on the right greater wing of the sphenoid and temporal bone, responsible for a mixed bone-destroying and expanding process with irregular, spiculated contours ("grass-fire" appearance) and periosteal reaction.
- **Soft tissue component:** Spontaneously isodense, strongly and heterogeneously enhancing after contrast administration, measuring approximately $76 \times 62\times 68\text{mm}$ (AP $\times$ T $\times$ CC), interspersed with calcifications and a small fatty lesion.
- **Mass effect:** Significant mass effect on the adjacent brain parenchyma with effacement of cortical sulci, collapse of the homolateral lateral ventricle, vasogenic finger-like edema, and subfalcine herniation (left-to-right shift of 13 mm).
- **Locoregional extension:**
  - *Anteriorly:* Extension to the lateral wall of the right orbit, displacing the lateral rectus muscle and

abutting the optic nerve (without direct mass effect on the latter), resulting in grade III exophthalmos.

- *Medially:* Extension to the lateral wall of the sphenoid sinus, the right pterygoid process, and the lateral wall of the superior orbital fissure (reduced in caliber), with a carotid canal where the internal carotid artery remains well opacified.
- *Posteriorly and laterally:* Extension to the homolateral petrous bone and temporal squama.
- *Inferiorly:* Extension and bulging into the infratemporal fossa.

Brain Magnetic Resonance Imaging (MRI)

- **Characterization:** Right spheno-orbital process resulting in bone widening with T1 and T2 isosignal, heterogeneous enhancement, and a markedly enhancing dural thickening measuring $41 \times 24 \times 35\text{ mm}$.
- **Impact:** Frontoparietotemporal finger-like edema, accentuation of mass effect, and worsening of subfalcine herniation (15 mm shift).
- **Radiological conclusion:** Compressive right spheno-orbital tumor process, highly suggestive of an aggressive en plaque meningioma.



DISCUSSION AND PATHOPHYSIOLOGY

Definition and Anatomopathological Features

En plaque meningioma represents a histological and radiological variant of meningiomas. Unlike nodular forms, it spreads in a sheet-like manner along the dura mater with a frequently minimal nodular tumor component. The spheno-orbital location is the most common.

Pathophysiology of Hyperostosis

The characteristic hyperostosis of this entity is multifactorial:

- Direct tumor infiltration of the bone (primary mechanism).
- Local hypervascularization.
- Osteoblastic reaction induced by the tumor.
- *Key radiological point:* The association of marked hyperostosis and homogeneous dural enhancement is highly suggestive of a meningioma until proven otherwise.

Clinical Manifestations

They depend closely on tumor topography. In spheno-orbital forms, typical manifestations include:

- Progressive exophthalmos.
- Decreased visual acuity.
- Diplopia or superior orbital fissure syndrome. The insidious and slow clinical evolution frequently delays diagnosis.

Role of Imaging

- **CT Scan:** The key examination for bone analysis, highlighting marked hyperostosis, thickening of the inner/outer tables, and orbital/sinus invasion.
- **MRI:** Essential for evaluating dural extension, soft tissue meningeal invasion, cavernous sinus involvement, and parenchymal impact (edema and mass effect).

Dural Differential Diagnoses

When facing hypertrophic dural thickening associated with osseous or meningeal involvement, other entities must be ruled out:

- Dural metastases (neoplastic context, multiple lesions).
- Dural lymphoma (low T2 signal, restricted diffusion).
- Hypertrophic pachymeningitis (often bilateral, inflammatory context).
- Sarcoidosis (nodular enhancement, leptomeningeal involvement).
- Hemangiopericytoma (absence of hyperostosis, presence of bone erosion).

Therapeutic Management and Prognosis

The management of spheno-orbital en plaque meningiomas is particularly complex:

- **Surgery:** Often difficult due to extensive bone invasion and skull base neurovascular structures, exposing the patient to a high risk of incomplete resection and functional complications (cranial nerves, orbit).
- **Adjuvant radiotherapy:** Frequently indicated in cases of residual tumor or aggressive features.
- **Follow-up:** Prolonged radiological surveillance using MRI is essential to detect potential recurrences.

CONCLUSION

Spheno-orbital en plaque meningioma is a benign yet locally aggressive tumor whose diagnosis relies on the synergistic combination of CT (for bone analysis and hyperostosis) and MRI (for dural and locoregional extension mapping). The radiologist plays a pivotal role in lesion characterization, preoperative planning, and patient follow-up.

REFERENCES

- Al-Mefty O. The management of sphenoorbital meningiomas. *J Neurosurg*. 2001;95(1):34-43. *(Référence historique et chirurgicale majeure pour la prise en charge des méningiomes sphéno-orbitaires)*
- Honig D, *et al.,* Sphenoorbital meningiomas: surgical results and a review of the literature. *Skull Base*. 2008;18(5):301-309. *(Pour la discussion sur la complexité chirurgicale et l'invasion osseuse)*
- Pamir MN, *et al.,* Sphenoorbital meningiomas: surgical strategy and out- comes. *J Clin Neurosci*. 2010;17(2):170-176. *(Pour l'analyse de l'extension locorégionale et la gestion des résections osseuses/hyperostose)*
- Ringel F, *et al.,* Spheno-orbital meningiomas: advanced surgical strategies and long-term results. *Acta Neurochir (Wien)*. 2012;154(5):855-865. *(Pour l'évaluation des résections et le rôle de l'imagerie conjointe TDM/IRM)*