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Introduction

Over 80% of patients with medial sphenoid wing meningioma can present with proptosis, which can be related to hyperostosis and/or soft tissue infiltration. However, it is not clear if this is related to primary tumor of the orbit or secondary inflammation.

The goal of the study was to understand how often the periorbital has evidence of tumor in sphenoid wing meningioma and if there are any clinical and radiologic features that are associated with tumor infiltration of the periorbital.

Methods and Materials

Cross-sectional cohort of patients with sphenoid wing meningioma who underwent surgical resection with biopsy of the periorbital.

Patients were gathered from a single academic institution over a 3-year period. Surgeries were transorbital or craniotomy by neurosurgery and oculoplastic.

Clinical characteristics and radiologic findings were collected. T1 post contrast fat saturated and T2 sequences were examined. Patients were divided into those in which the periorbital demonstrated infiltration with meningioma on pathology and those that did not.

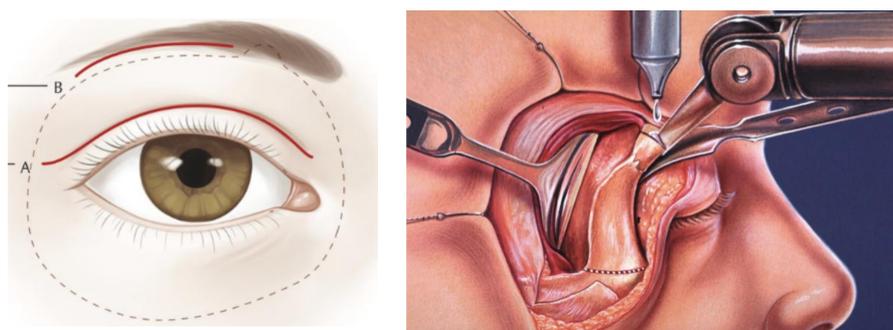


Figure 1. (Left) A lateral eyelid crease incision was used for the transorbital approach. (Right) A bony marginotomy was created and the sphenoid bone removed with a coarse diamond drill to access the deeper part of the tumor. The periorbital was also biopsied.

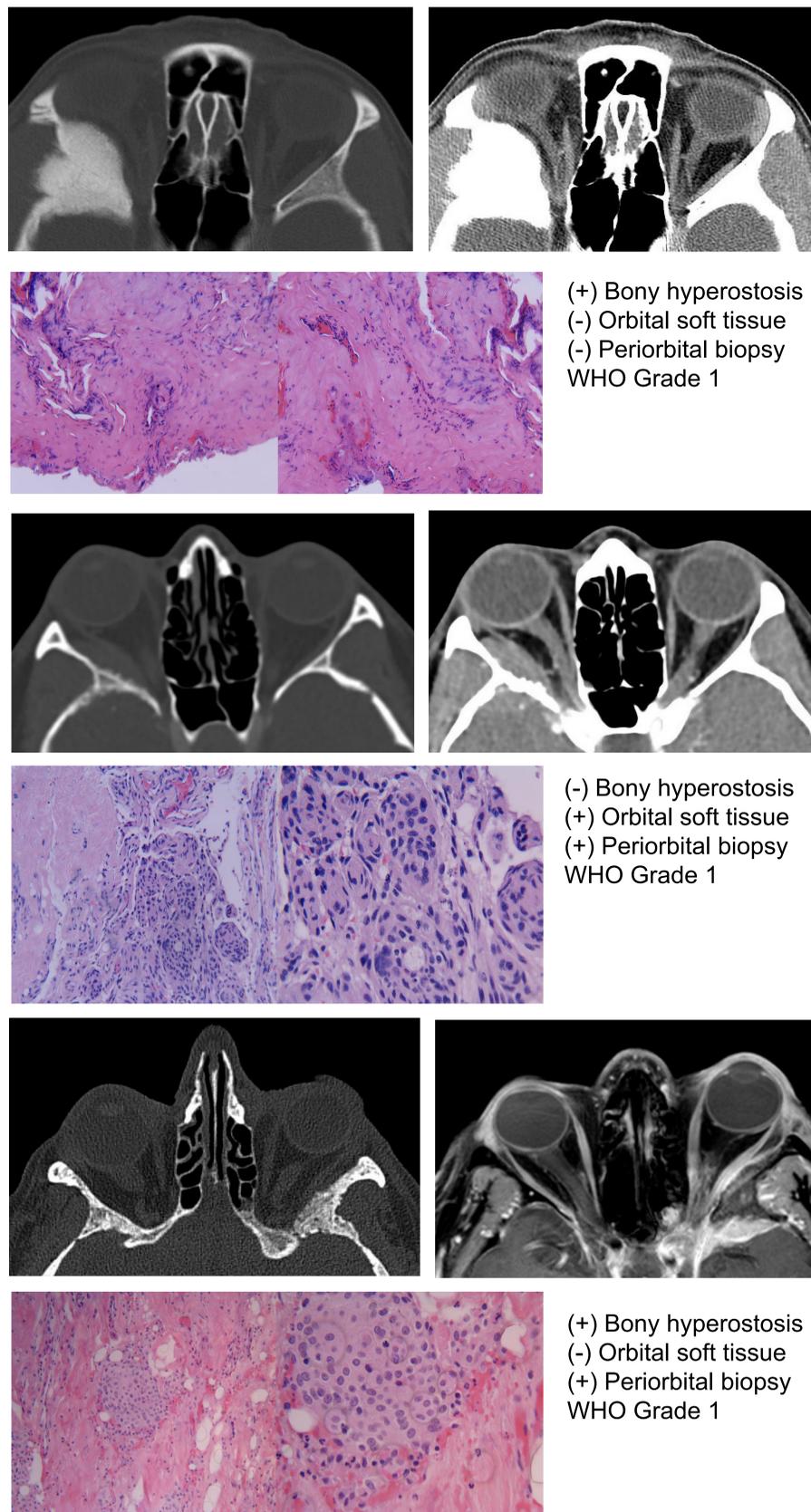
	(-) Biopsy	(+) Biopsy	Total
N	4	16	20
Age (years)	53.0	60.1	59.3
Symptoms			
Orbital Pain	0%	25%	20%, P=0.55
Headache	75%	25%	35%, P=0.08
Diplopia	0%	13%	10%, P>0.99
Exam			
BCVA (logMAR)	0.6	1.0	0.9, P=0.11
Proptosis	100%	100%	100%, P>0.99
Motility Restriction	50%	37%	40%, P>0.99
Optic Neuropathy	0%	37%	30%, P=0.27
Imaging			
Hyperostosis	100%	75%	80%, P=0.54
Orbital Soft Tissue	0%	87%	65%, P=0.01
WHO Tumor Grade			
Grade I	100%	77%	74%, P=0.53
Grade II	0%	13%	10%
Grade III	0%	20%	16%

Table 1. Demographic, clinical, and radiographic information are described. Patients with positive periorbital biopsies for meningioma were more likely to have orbital soft tissue extension on imaging. P-values calculated with Fisher's exact testing.

Results

20 patients with sphenoid wing meningioma underwent biopsy of the periorbital. 80% showed evidence of meningioma in the periorbital. Orbital soft tissue extension was more likely in these cases. Two patients (12%) with positive periorbital biopsies did not have radiologic evidence of orbital soft tissue extension.

Figure 2. Representative images of patients with sphenoid meningioma with and without tumor infiltration of the periorbital with corresponding low/high mag pathology slides.



Conclusions

The absence of orbital soft tissue extension of sphenoid wing meningioma on imaging does not rule out tumor infiltration of the periorbital. Meningioma infiltration in the periorbital was not required to have bony hyperostosis.

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