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# Spheno-orbital Meningioma Presenting with Mild Proptosis and Visual Loss: A Case Report and Literature Review

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## ABSTRACT

Sphenoid wing meningiomas commonly present with headaches and visual changes. Some presentations may vary depending on the meningioma's site of growth. Here we present a gentleman with no headaches, a very mild proptosis that went unnoticed, together with a rapid visual loss that progressed over 4 months. Prior to presenting at the eye casualty, he has been assessed by other doctors and opticians, who diagnosed his fundal toxoplasmosis scar as the cause of his visual loss. Only through a thorough examination and measurement, did the mild proptosis become a significant part of the investigations and diagnosis. Neuroradiological investigations confirmed a diagnosis of spheno-orbital meningioma, for which he underwent 2 surgeries to achieve satisfactory debulking of the mass. This case report is to highlight the importance of having a systematic approach when reviewing patients with proptosis, and to always explore other potential causes for visual loss. A brief review of literature looking at the various causes of unilateral proptosis and different presentations of spheno-orbital meningiomas is included.

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## Background

Proptosis describes the eyeball protruding out from the eye socket. When presenting together with visual changes, prompt review with a good knowledge of differentials is important as some of the causes may involve other systems and can be sight or life threatening.

Here we present a gentleman who presented with proptosis and visual disturbances, which was eventually diagnosed as a spheno-orbital meningioma.

## Case presentation

We present an 89-year-old Afro Caribbean male patient with a history of type 2 diabetes, enlarged prostate, and hypercholesterolaemia. He presented to the eye casualty with a 1-year history of left-sided visual impairment and eye pain, plus a recent 4-month significant rapid deterioration in visual acuity.

On examination, he had a 3mm proptosis of his left eye (Figure 1). This was a new finding that was unnoticed even by the patient himself. His left eye vision was reduced from 20/17 before to only hand movements. Visual fields were very constricted, while examination of the fundus revealed a fundal toxoplasmosis scar superior to the macula (Figure 2).

CT scan revealed a left sphenoid ridge mass involving the cavernous sinus and retro orbit on the left side. Subsequent MRI scan showed a sphenoid ridge meningioma invading the left orbital apex, involving the left optic nerve and cavernous sinus with extension into the anterior cranial fossa and anterior part of the middle cranial fossa encasing the left internal carotid artery (Figure 3).

He was referred to the neurosurgeons who proceeded with urgent elective craniotomy and cranioplasty for removal of the sphenoid-orbital meningioma.

Post his 1st surgery, he continued experiencing residual proptosis due to residual tumour. He was discussed at the MDT and proceeded with a 2nd surgery to debulk the residual spheno-orbital meningioma via left pterional craniotomy.

At his latest clinical review after recovering from surgery and post-op complications, his proptosis has resolved but the residual 3rd nerve palsy and ptosis persisted. Similarly, his optic neuropathy remained, and he remains blind in his left eye.

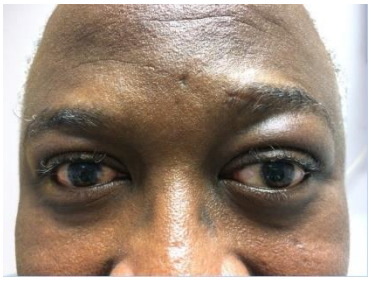

**Figure 1.** 3mm proptosis of the left eye

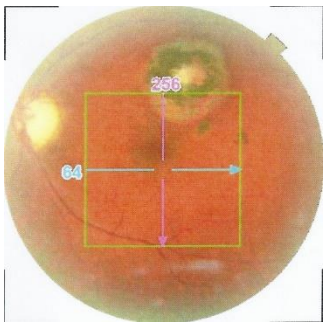


**Figure 2.** Old toxoplasmosis scar on the left eye fundus

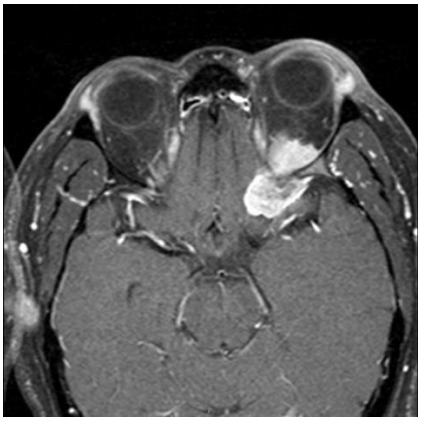

**Figure 3.** Left sided sphenoid wing meningioma invading the retro-orbit.

## Discussion

Unilateral proptosis can be caused by orbital cellulitis, developmental anomalies, inflammatory conditions, vascular anomalies, neoplasms, and metabolic diseases[1]. The severity of the proptosis can be measured using an exophthalmometer, where a protrusion difference of more than 2mm between both eyes is widely accepted as abnormal[2]. When presenting together with visual disturbances, in addition to detailed histories and examinations, fundal examination with either direct or indirect ophthalmoscopy is imperative to assess integrity of the optic nerve.

In our case, the patient presented with rapid monocular visual loss and a subtle 3 mm proptosis that was only noticed by the consultant ophthalmologist reviewing him. His fundal examination showed mild damage to the optic nerve. While his old fundal toxoplasmosis scar was initially thought to be the cause of his visual loss, it eventually became a red herring when imaging revealed the extensive spread of his medial sphenoid wing meningioma, which involved the optic nerve, cavernous sinus, anterior and middle cranial fossa, and internal carotid artery.

Sphenoid wing meningiomas were first categorised in 1938 by Cushing and Eisehart into 3 groups according to the position – inner (also known as medial or clinoidal), middle (or alar), and outer (also known as lateral or pterional)[3].

The most common presentations for medial wing meningiomas are visual disturbances and headache[4]. The degree of visual loss is dependent on the severity of the disease. Verma et al have reported monocular and binocular visual changes, ranging from no perception to 20/80 vision in affected eye(s)[5]. Other reported symptoms include seizures, proptosis, and cranial nerve III – VI palsies[5]. The causes of these symptoms can be attributed to the medial wing meningiomas encroaching into the cavernous sinus, anterior visual pathways, and anterior circulation arteries[4].

Presentations in middle and lateral wing meningiomas include progressive visual loss, oculomotor nerve dysfunction causing transient diplopia, proptosis, peri-orbital pain, cranial nerve V1 branch numbness, and seizures[6]. These are due to the meningiomas' ability to grow into the inner portion of the sphenoid wing, extending to the clinoid process, optic nerve, and internal carotid artery[6]. The hyperostosis can cause compression of the sylvian veins, superior orbital fissure, and the intraorbital structures, which may lead to fronto-temporal brain oedema[6].

Other rarer presentations of sphenoid wing meningiomas include temporomandibular disorders and orofacial pain, transient ischaemic attacks, cognitive impairment and reduced psychomotor ability, hemiparkinsonism, subdural haematoma, acute intracerebral haemorrhage, and sensorineural hearing loss[7–13].

## Conclusion

Unilateral proptosis with visual changes warrants urgent investigations and management to halt the disease progression. In cases where there is very mild proptosis, an exophthalmometer should be used to accurately measure the defect. When paired with unexplainable rapid loss of vision, neoplasms should always form part of the differentials, with CT and MRI scans being part of the investigation. Red herrings may complicate the diagnosis at times, but detailed individual assessment of each patient with fresh differentials can make all the difference.

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