

Case Report

Management of Proptosis in a Case of Sphenoid-Orbital Meningioma

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Abstract

Sphenoid-orbital meningiomas (SOMs) are difficult to completely resect because they involve the sphenoid wing, orbit, and cavernous sinus. As the tumor invades the optic canal, SOMs frequently present with visual deficits. The authors of this case report dealt with the case of a 65-year-old male patient who had right-sided proptosis. We diagnosed the patient, and his MRI revealed of him having SOM. The surgical approach was determined by the tumor's placement in the orbit and cranial cavity and its connections to the optic canal and optic nerve axis. Tumor was removed successfully by surgery. The patient retained a proptosis of less than 4 mm during the follow-up period. The visual acuity, visual field, and ocular fundus were examined during the follow-up. SOMs are notoriously difficult to treat surgically. The primary goal of surgery in symptomatic individuals with SOMs is to slow down the tumor's progression. Longer periods of post-operative follow-up is recommended to observe long-term results.

Key words: Proptosis, Sphenoid-Orbital Meningioma, Visual deterioration.

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Introduction:

Meningiomas of the sphenoid ridge with considerable tumor extension into the orbit are known as sphenoid-orbital meningiomas. SOMs are slow-growing, complicated tumors that account for up to 9% of intracranial meningiomas¹. The optic canal, superior orbital fissure, or lateral orbital wall may all be involved². SOMs have distinct clinical and anatomical characteristics. The soft-tissue component can affect extracranial compartments, such as the orbit and its contents. The usual clinical symptoms seen in individuals with SOMs, such as proptosis, cranial nerve palsy, and visual impairment, are caused by these intraosseous, intraorbital, and intradural alterations^{3,4}. Visual impairment, proptosis, and

aesthetic deformity are the most common signs and symptoms of SOMs. Even though proptosis is the most common clinical sign, visual acuity is reduced in 40–60% of cases [3,5]. It is mostly caused by tumor invasion of the optic canal, with the intraorbital tumor appearing to be less prominent. As a result, surgical management of optic canal invasion is critical for visual success. SOM resection generally necessitates considerable extradural and intradural surgery, as well as substantial sphenoidal and orbital bone resections. The surgical removal of these tumors is linked with a high rate of morbidity and death of up to 6% [5]. The reported case involves a remarkable SOM in a 65-year-old male patient with right-sided proptosis.

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Case presentation

This case report presents a 65-year-old male patient who presented with right-sided proptosis and was later diagnosed with sphenoid-orbital Meningioma. We used computed tomography (CT) and magnetic resonance imaging (MRI) and examine the patient's images (MRI). Right eyeball was unilaterally proptosed (Figure 1). The tumor's depression in the temporal lobe was measured to be 4.5 cm in diameter from front to back. The meningioma occupied the right orbit, causing the right eyeball to be displaced anteriorly and the right optic nerve stretched. When comparing the damaged right optic nerve to the normal left optic nerve, image findings revealed decreased cellularity, axon loss, and

greater connective tissue deposits in the affected right optic nerve. In addition, the central retinal artery walls in the right optic nerve seemed acellular compared to those on the left. The surgical approach was determined by the tumor's placement in the orbit and cranial cavity and its connections to the optic canal and optic nerve axis. We conducted additional evaluation on the patient and prepared him for surgery. Surgical excision was used to successfully remove the SOM. The following were the postoperative parameters: the patient maintained a proptosis of less than 4 mm (Figure 2). The clinical follow-up included tests of visual acuity, visual field, and ocular fundus at 3 months, one year, and subsequently every other year.

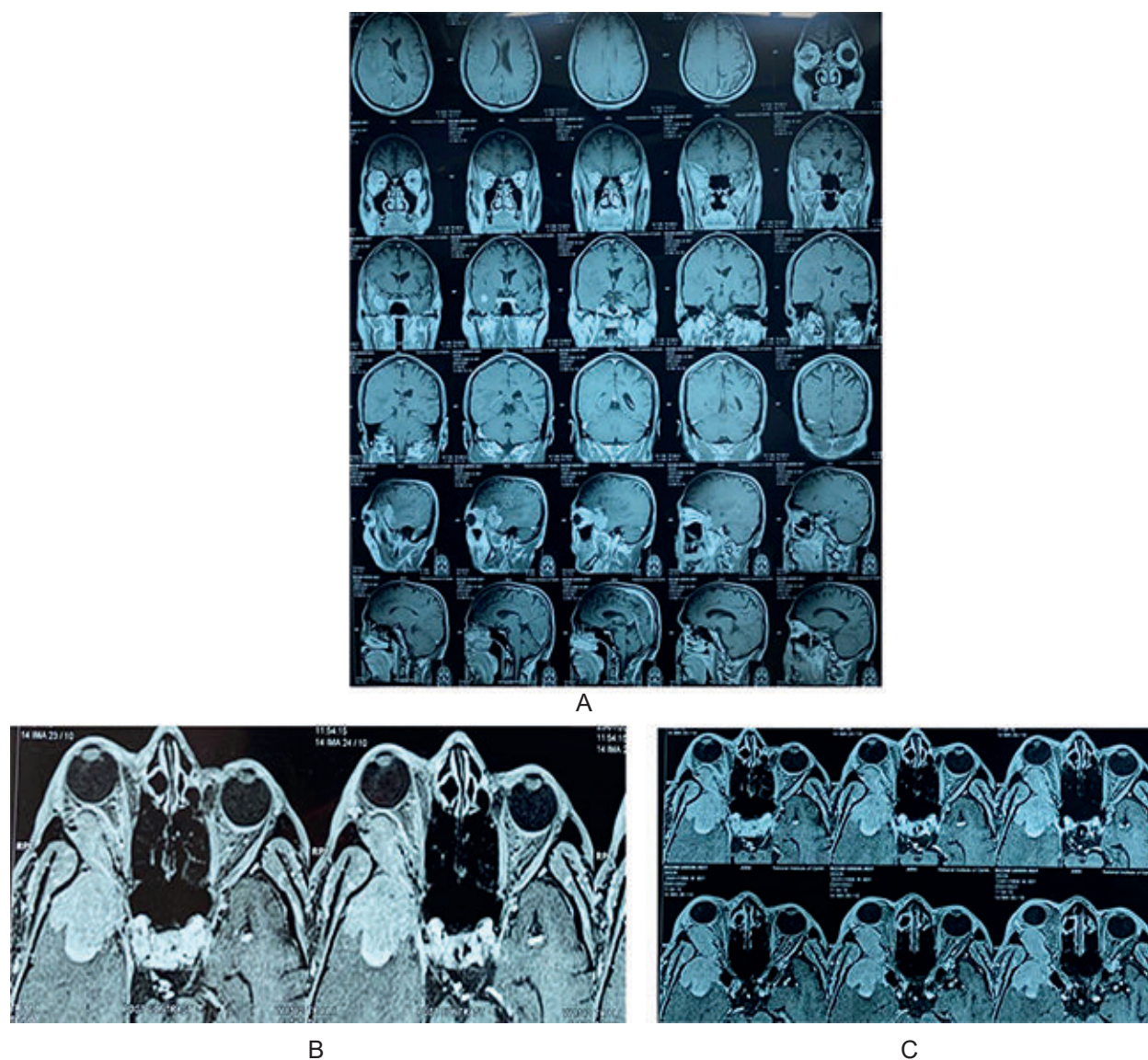


Fig.1 (A-C): Preoperative MRI of Brain of the patient.

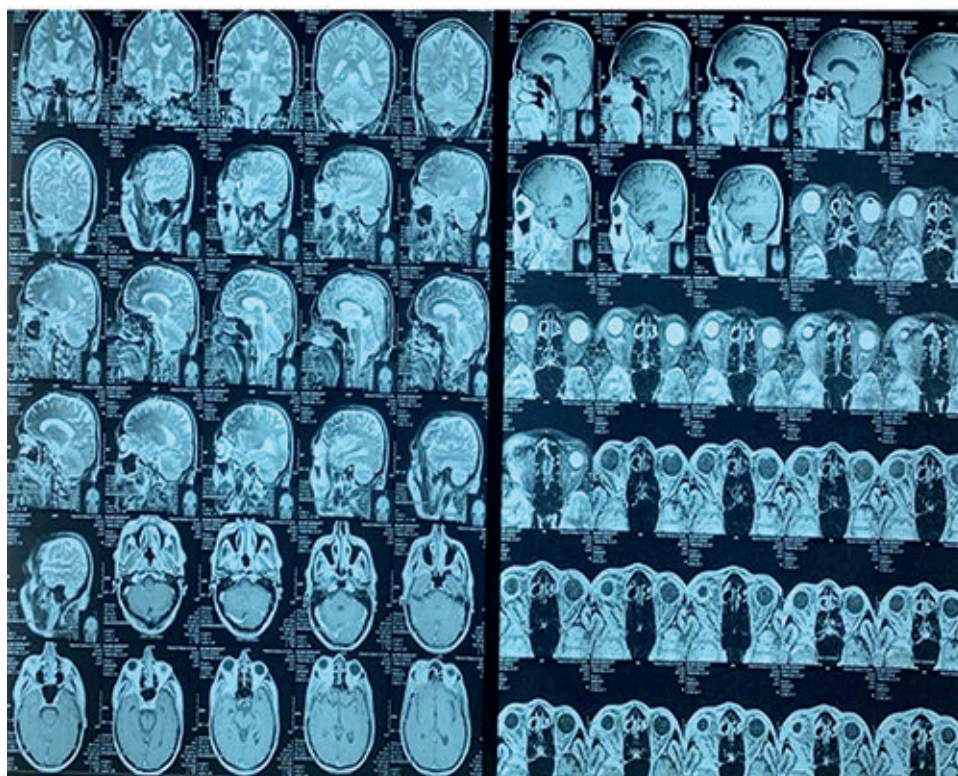
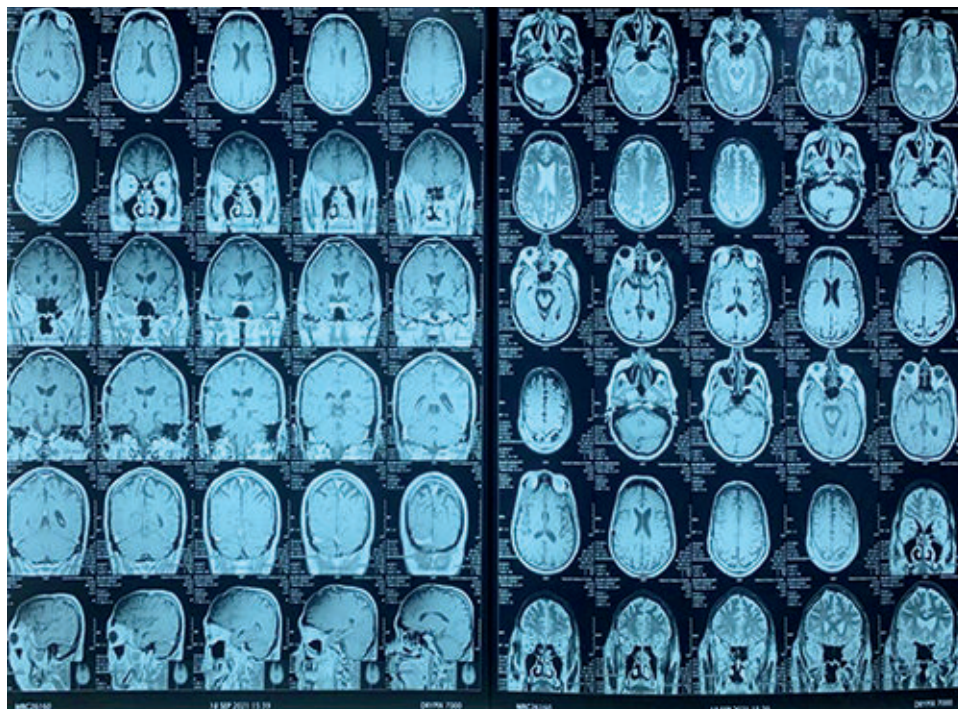


Fig.-2 (A, B): Postoperative MRI of Brain of the patient.

Discussion:

The SOM in this case study took up residence in both the right skull and orbit, squeezing the temporal and frontal lobes, thickening the optic nerve sheath,

and reducing the number of axons in the optic nerve. Most meningiomas are believed to begin intracranially in the central nervous system, with the parasagittal and falx areas (25%), convexities of the brain

parenchyma (20%), and the sphenoid ridge (20%) being the most prevalent places⁶.

This case report's histological study and the neoplasm's dural confinement support its classification as a spheno-orbital meningioma. These tumors can penetrate the skull via the dura in 25% to 50% of instances, causing overproduction, erosion, or penetration of the bone⁷.

Meningiomas can cause headaches and seizures in any location, with epileptic seizures being reported as the first symptom in 20% to 50% of patients [6]. Disfiguring proptosis, poor visual acuity, orbital discomfort, epiphora, diplopia, and eyelid edema are common in patients with SOMs⁸. Patients with a lateral sphenoid wing meningioma experience painless unilateral exophthalmos, and unilateral loss of vision [8]. The patient in this case report had proptosis in the right eye (Figure 1) and had poor vision, acuity 6/9, there was no restriction of eye movement and funduscopy revealed papilloedema.(Figure 1).

Because of its location and size, this tumor is of considerable interest. At the last follow-up in our study, the patient's degree of proptosis had decreased by 4 mm as a result of the operation. At a mean follow-up of 5 years, research found a 96% improvement in proptosis following surgery for SOMs, although no exophthalmometry data were given⁴. Magill et al. looked at the correlations between the location, size, and WHO grade of meningiomas in 1,113 individuals⁹. The median tumor size was 3.6 cm, and the mean tumor size was 3.8 cm among the 1,113 meningiomas⁹.

Surgery is the treatment for SOMs. Complete excision is the desired surgical goal; however it might be difficult to achieve. According to a study, the majority of patients are cured with excision alone⁷. Excision usually entails the removal of the tumor, dural attachment, and any infiltrated bone, as well as a histological diagnosis that will guide future treatment. Radiotherapy and hormone therapy are further treatment options, but they are usually reserved for atypical, malignant, or recurring meningiomas¹⁰. Cannon et al. looked at 12 individuals who had SOMs removed using a multimodal surgical approach¹¹. 75% of patients had their proptosis reduced or stabilized after surgery, although visual acuity results were varied¹¹. SOMs can increase the risks of surgical intervention, so each case should be thoroughly investigated.

Conclusion

Meningiomas are treated primarily with surgical excision, aiming at complete resection and symptom relief. The procedure is challenging to conduct, and the goal of surgery in symptomatic SOM patients is to slow down the tumor's growth. Post-operative observation and follow-up should be done for longer lengths of time. New findings should be reported to add to the current knowledge base and better understand the SOM behavior.

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