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A Giant Thrombotic Aneurysm of the Internal Cavernous Carotid Artery Mimicking a Meningioma of the Lesser Wing of the Sphenoid Bone - A Case Report

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Abstract: ***Giant cavernous segment of carotid artery aneurysms are rare pathologic entities that are typically benign and are considered less life-threatening due to the low risk of rupture of bleeding. They present with clinical features usually due to mass effects on adjacent neural structures, mainly the III, IV, V, and VI cranial nerves. Clinical symptoms depend on aneurysm's location. Differential diagnosis includes pituitary adenoma, meningioma, Craniopharyngioma, glioma, and ven granuloma. Here, the authors report a case of a 62-year-old female patient with a giant partial thrombosed aneurysm of the internal cavernous segment of carotid artery mimicking a meningioma of the lesser wing of the sphenoid bone who presented for visual defect, and raised intracranial pressure. The authors will proceed with a literature review investigating this entity as well its ability of mimicking meningioma.***

Keywords: Giant cavernous segment of carotid artery aneurysms, Meningioma ,MRI, Angiography

1. Introduction

Giant cavernous segment of carotid artery aneurysms are uncommon occurrences with a prevalence of 0.3%-1.4% of cases among all intracranial aneurysms [1,2]. These aneurysms typically manifest during the fifth to seventh decades of life and have a significant female predominance [3]. Due to their extradural nature is considered benign lesions with fewer chances of bleeding or life-threatening complications. They manifest their symptoms due to mass effects on the adjacent local nerves, most commonly involving CN III, IV, and V, such as ophthalmoplegia and facial pain. A most common presentation of an unruptured aneurysm is diplopia with retro-orbital pain or ipsilateral headache. Rarely, they involve the optic nerve and subsequent reduced visual acuity, sometimes even leading to loss of vision [1]. Differential diagnosis includes pituitary adenoma, meningioma, craniopharyngioma, hamartoma, glioma, teratoma, and even granuloma.

Here, the authors report a case of a 62-year-old female patient with a giant near complete thrombosed aneurysm of the cavernous portion of internal carotid artery mimicking a meningioma of the lesser wing of the sphenoid bone . patient presented with visual defects in both eyes, and raised intracranial pressure. The authors will proceed with a literature review investigating this entity as well its ability at mimicking meningioma.

2. Case Report

A 62-year-old female patient with no previous medical or surgical history who was referred by the basic health unit of her locality to our department of Neurosurgery. patient has 8 months history of recurrent visual defects in both eyes associated to a right temporal throbbing pulsating headache. There was no clinical history of vomiting or seizures. The patient was awake, communicative, and well oriented in time and place on neurological examination. A decreased visual acuity was observed in both eyes and a bitemporal hemianopsia . The patient reported having previous NCCT brain in a private imaging center showing a extradural mass at right planum sphenoidale and gives the probable possibility of meningioma. In our institute , a first non–enhanced computed tomography (CT) scan (FIG.I) was performed showing a right extraaxial anterior temporal parasellar lesion probably originating from the anterior clinoid process of the sphenoid bone with cranial extension holding calcifications.. All these features suggested meningioma originating from the lesser wing of the sphenoid bone.

3. Imaging Findings

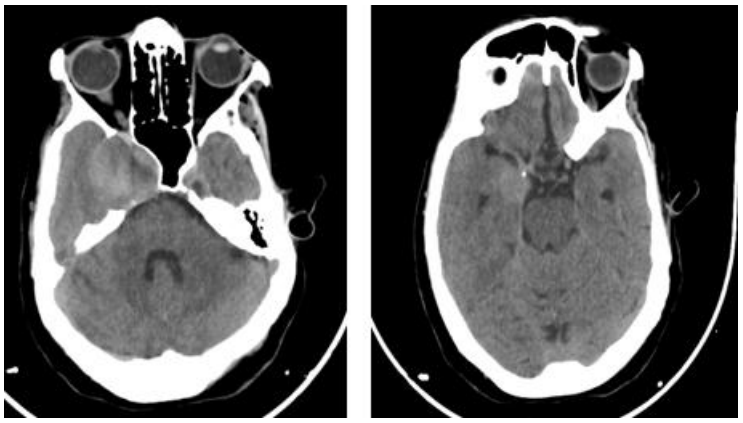
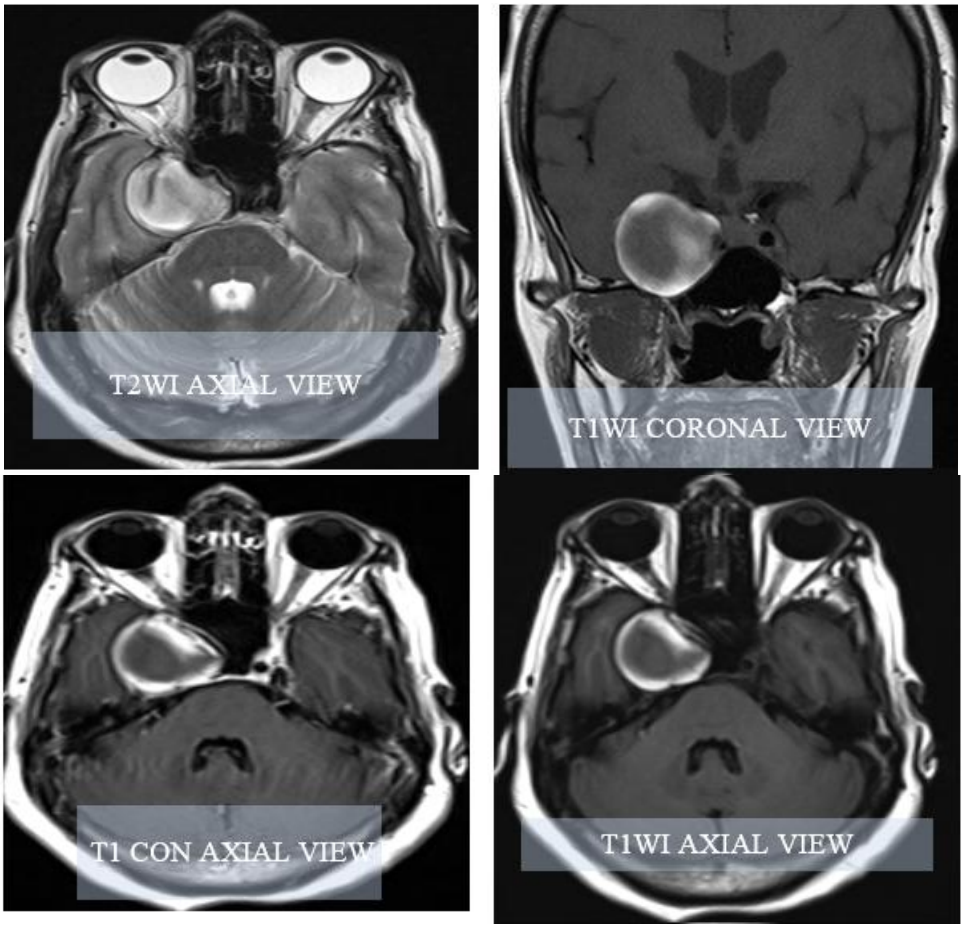


Figure 1

Fig.1 Axial non–enhanced computed tomography (CT) scan in parenchymal window showing a right extraaxial anterior temporal parasellar lesion probably originating from the anterior clinoid process with cranial extension holding calcifications

Subsequently, patient was submitted to a brain magnetic resonance imaging (MRI) (FIG.II) revealing a parasellar lesion measuring 29x29x26 mm in diameter lateralized to the right side with peripherally hyperintense and central hypointense area in T1W, and T2W & not supressed on STIR. with resulting in a mass effect on the optic chiasma and right optic nerve and displaced pituitary gland towards left side, there was a peripheral enhancement similar to the arterial network communicating with the internal cavernous carotid artery suggesting a thrombotic aneurysm.

Further examination by a CT angiography (FIG.III) was performed. A saccular aneurysm that measured 30 mm in maximal dimension was then showed. Enhancement was similar to the arterial network and communicating with the internal cavernous carotid artery. No additional aneurysms were identified and there was no arterial occlusion or hemodynamically significant narrowing.



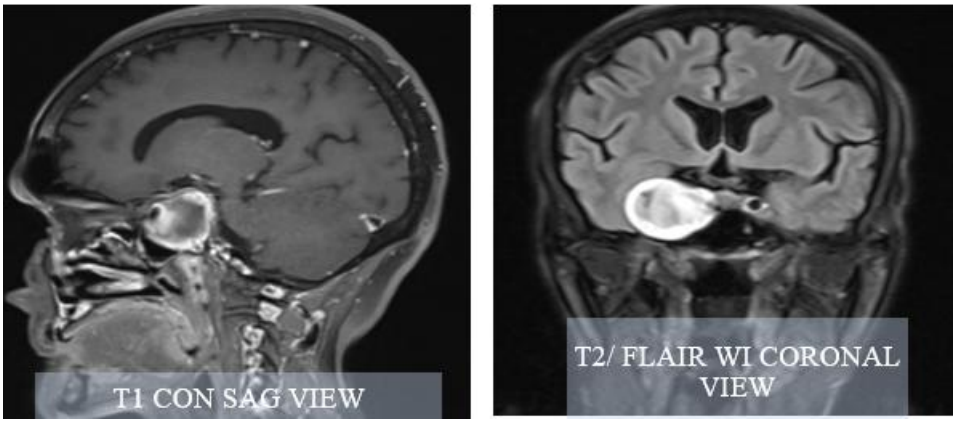


Figure II

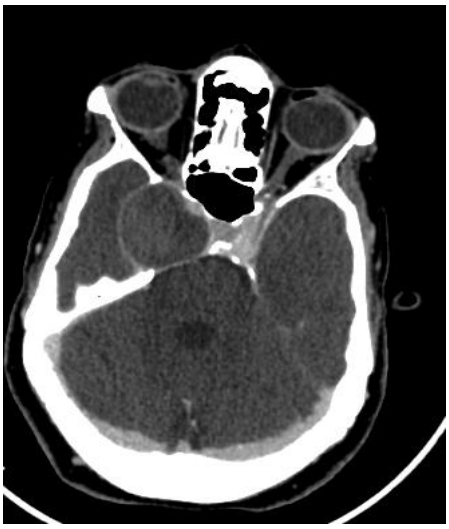


Figure III

Fig.II. Axial brain magnetic resonance imaging (MRI) showing a suprasellar lesion measuring 29x29x26 mm in diameter lateralized to the right side with peripherally hyperintense and central hypointense area in T1W, and T2W & not supressed on STIR. with resulting in a mass effect on the optic chiasma and right optic nerve and pituitary gland towards left side . there was a peripheral enhancement similar to the arterial network communicating with the internal cavernous carotid artery suggesting thrombotic aneurysm.

Fig. III. CT angiography showing the saccular aneurysm that measured 30 MM in maximal dimension. Peripheral Enhancement was similar to the arterial network and there was a significant communication with the internal cavernous carotid artery.

Patient refused any further investigation, and was then discharged from hospital and lost follow up

4. Discussion

Cases of giant cavernous segment of carotid artery aneurysms are rarely reported in the literature, with very few scattered case reports. Giant aneurysms of the cavernous segment of the ICA are aneurysms measuring more than 25 mm in diameter and represent 2%-9% of all intracranial aneurysms [1,2]. These aneurysms typically manifest during the fifth to seventh decades of life with a significant female predominance [3]. Most giant aneurysms are of the saccular type.

they often have a benign course and remain asymptomatic with an overall low risk of rupture and complications. Clinical presentation is caused by the local mass effect of the aneurysm on surrounding structures depending on the direction of growth. Owing to their position in the venous pouch, they usually grow very large in size until they produce any mass effect. These include diplopia, due to involvement of the III, IV, and VI cranial nerves independently or in combination, miosis, resulting from involvement of ocular sympathetic innervation, reduction in visual acuity, caused by compressive optic neuropathy, corneal hyperesthesia and trigeminal dysesthesias due to injury of the first/second branch of the trigeminal nerve [1]. In addition, pain, ranging from unilateral headache to retro-orbital and facial pain, has been commonly reported. Although complications are rare but vascular complications may occur in the form of subarachnoid hemorrhage (2%), cavernous carotid fistula, or embolic/ischemic cerebral infarction [1,2].

According to the international study of unruptured intracranial aneurysms, giant aneurysms carry a 6% annual risk of rupture compared with a 1%-3% annual risk for smaller aneurysms [6]. Our patient did not present any sudden neurological symptoms related to the rupture of her aneurysm but rather it was a syndrome of raised intracranial pressure and visual defects that led her to consult us.

Differential diagnosis of sellar and parasellar lesions includes, in addition to pituitary adenomas and aneurysms, other neoplasms such as meningioma, craniopharyngioma, hamartoma, glioma, teratoma, and even granuloma.. A rim of calcification is more consistent with aneurysms as it was seen in our case, while focal calcification suggests craniopharyngioma or meningioma, and that aneurysms are more eccentric than other sellar masses. [9]

In general treatment for aneurysm, direct occlusion of the aneurysm with parent artery preservation is the best method. Coiling is the standard treatment for small symptomatic aneurysms and all ruptured cavernous aneurysms [1]. As for large and giant aneurysms, parent ICA occlusion was the preferred method of treatment, which was the method of treatment, in this case, resulting in excellent outcomes. Other endovascular treatment modalities such as selective

coiling, bypass surgery before ICA occlusion, or conservative treatment are indicated in case of ICA occlusion intolerance [1, 2]. In our patient we did not, unfortunately, perform any of these therapies as she decided to be discharged against medical advice.

The rupture of these aneurysms is a catastrophic event, and most patients who survive have severe neurologic dysfunction [3]. Ever-evolving technologies continue to broaden therapeutic options for patients with giant intracranial aneurysms and to improve morbidity and mortality.

5. Conclusion

Giant aneurysms of the internal cavernous carotid artery are clinically manifested by headache and sudden complex ophthalmoplegia associated or not with other signs and symptoms. Cranial X-rays show saddle alterations that may lead to misdiagnosis of other pathologies in this region. The most sophisticated radiological exams (CT and MRI) are often not enough to make the differential diagnosis of lesions in this region, requiring further cerebral angiography. Surgical treatment, by direct clip occlusion is usually the preferred surgical technique in correcting the symptoms of these patients, and has a low rate of complications.

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