



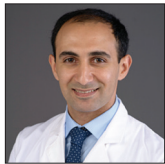
Case Report

A rare case of ruptured intracranial aneurysm arising from the retro-mastoid branch of the occipital artery

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ABSTRACT

Background: Aneurysms of the occipital artery (OA) are rare, with few cases published in the literature. The pathophysiology is unknown, and the presentation is variable. We present a case of a ruptured intracranial aneurysm arising from a branch of the OA.

Case Description: A 36-year-old male with a history of ankylosing spondylitis presented with altered mental status after an assault. On examination, he was intubated, with a Glasgow coma scale of 9, and imaging of the head and neck revealed a subdural hematoma of the posterior fossa and the cervical spine. The patient underwent suboccipital craniectomy and C1-5 laminectomy with the evacuation of the subdural hematoma. Postoperative cerebral angiography showed an intracranial aneurysm arising from the retromastoid branch of the OA on the left side. Furthermore, the parent vessel of the aneurysm supplied the left lower half of the cerebellar hemisphere. The aneurysm and the parent vessel were embolized using platinum coils. The patient tolerated the procedure well, and magnetic resonance imaging of the brain showed a minor left-sided cerebellar infarct, which was asymptomatic. The patient was discharged home with a modified Rankin scale of 2. There were no outpatient follow-up data available because the patient lost to follow-up.

Conclusion: Intracranial OA aneurysms are extremely rare with no clear consensus concerning the management of these aneurysms. They can be treated using endovascular and or open surgical techniques depending on the aneurysm characteristics, patient condition, rupture status, and others.

Keywords: Aneurysm, Artery, Occipital, Posterior inferior cerebellar artery

INTRODUCTION

Aneurysms of the occipital artery (OA) can be true or pseudoaneurysms. The true aneurysm subtype is rare, with only ten cases published in the literature.^[1-10] Moreover, true intracranial aneurysms arising from a branch of the OA are extremely rare, with only two cases previously reported.^[9,10] The exact pathophysiology is unknown, and the presentation varies based on the location, size, and rupture status of the aneurysm.^[1-10] We present a case of a ruptured intracranial aneurysm arising from the retromastoid branch of the OA.

CASE DESCRIPTION

The patient is a 36-year-old male with a history of ankylosing spondylitis, COPD, and seizure disorder presented with altered mental status after being assaulted. On exam, he was intubated,

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with a Glasgow coma scale of 9, and imaging of the head and neck revealed a subdural hematoma of the posterior fossa and the cervical spine [Figure 1]. He underwent suboccipital craniectomy and C1-5 laminectomy with the evacuation of the subdural hematoma. Postoperative cerebral angiography showed an intracranial aneurysm arising from the retro-mastoid branch of the OA on the left side [Figure 2]. Furthermore, the parent vessel of the aneurysm supplied the left lower half of the cerebellar hemisphere. The aneurysm configuration indicated that definitive treatment (microsurgical or endovascular) would include sacrificing the parent vessel. Balloon test occlusion of the OA showed some cross filling of the left lower cerebellar hemisphere through the left posterior inferior cerebellar artery (PICA) [Figures 3 and 4]. Therefore, the aneurysm and the parent vessel were embolized using platinum coils. The patient tolerated the procedure well, and magnetic resonance imaging of the brain showed a minor left-sided cerebellar infarct, which was asymptomatic [Figure 5]. Furthermore, the patient underwent craniocervical instrumented fusion to stabilize the craniovertebral junction. After a protracted hospital stay, the patient was eventually discharged home with a modified Rankin scale of 2. There was no outpatient follow-up data available because the patient lost to follow-up.

DISCUSSION

True aneurysms of the OA are rare, with few cases reported in the literature.^[1-10] They can present with headache, a pulsatile mass of the scalp or the neck, neck pain, tongue weakness (compression of the hypoglossal nerve), or intracranial hemorrhage, depending on the size, location, and rupture status.^[1-10] Our patient presented with subdural

hematoma of the posterior fossa and cervical spine because the aneurysm was located within the subdural space. The exact pathophysiology of true OA aneurysms remains unknown, with some association with genetic diseases (e.g., neurofibromatosis type I), increased demand (e.g., internal carotid artery ligation), autoimmune conditions, and others.^[1-10] In this case, the unique cerebral vascular anatomy is more likely of embryologic origin. Furthermore, it is unlikely that the aneurysm was due to the assault because there was no penetrating injury to the head and no skull fractures. Potentially, the increased flow demand had contributed to the development of this aneurysm because the parent vessel was supplying a large part of the cerebellum,

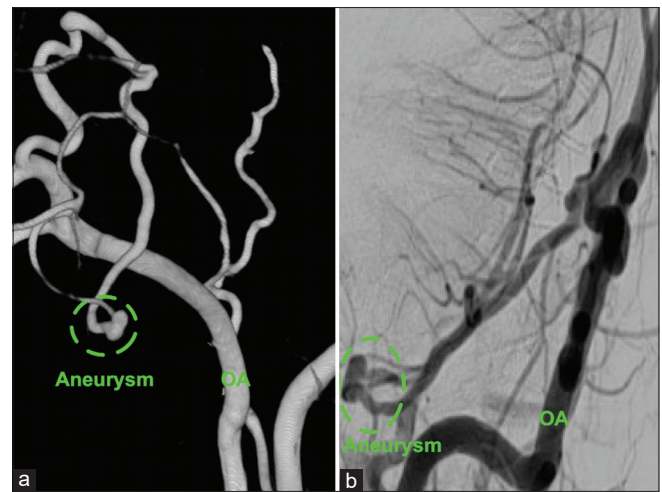


Figure 2: (a) A 3D reconstruction of the left occipital artery angiogram that shows the aneurysm. (b) A subtracted angiographic image of the left occipital artery that shows the occipital artery and the aneurysm.

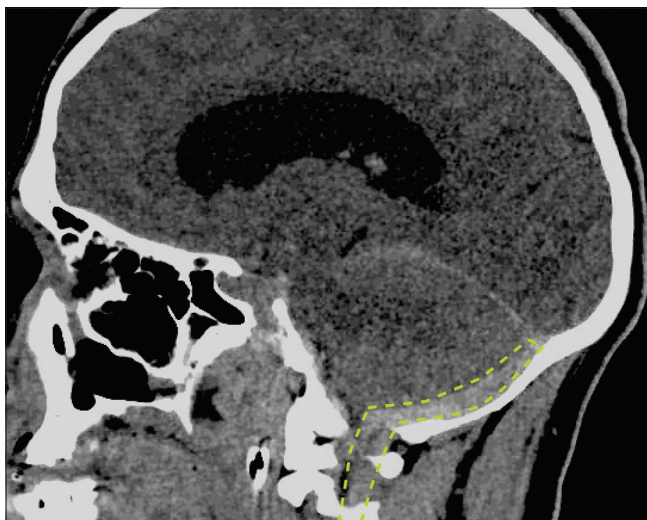


Figure 1: A computed tomography image shows the subdural hematoma (dotted line) within the posterior fossa and cervical spine.

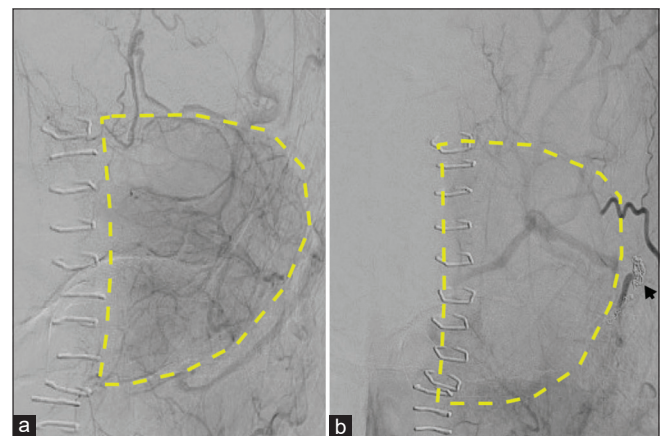


Figure 3: (a) A subtracted angiographic image (pre-embolization) of the left occipital artery (capillary phase) that shows the cerebellar blood supply. (b) A subtracted angiographic image (post-embolization) of the left occipital artery (capillary phase) that shows the diminished cerebellar blood supply.

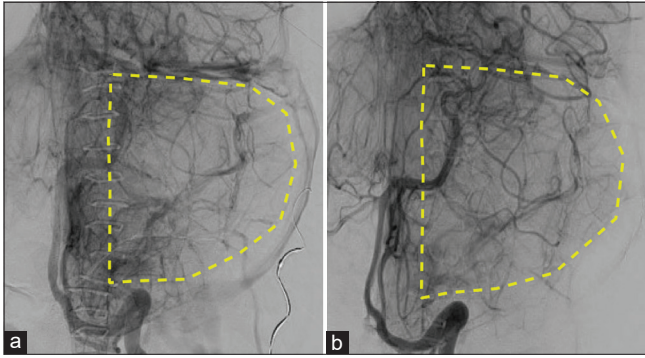


Figure 4: (a) A subtracted angiographic image (pre-embolization) of the left posterior inferior cerebellar artery (late-arterial phase) that shows the cerebellar blood supply. (b) A subtracted angiographic image (post-embolization) of the left occipital artery (late-arterial phase) that shows the increased cerebellar blood supply.

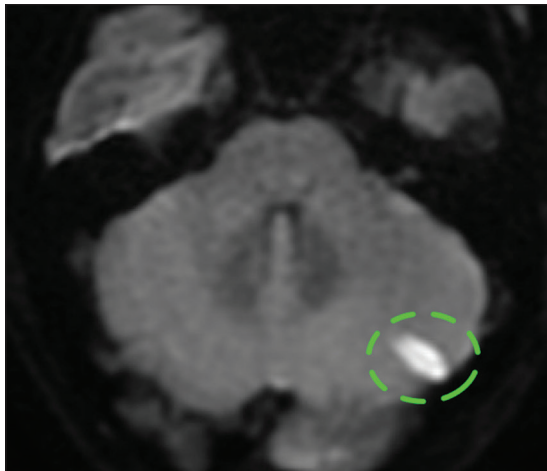


Figure 5: MRI image (diffusion-weighted sequence, axial view) that shows the minor stroke of the left cerebellar hemisphere after embolizing the occipital artery aneurysm along with the parent vessel.

which is normally supplied by the PICA. Moreover, there was no evidence of arteriovenous fistula.

The management of OA aneurysms includes observation or obliteration using endovascular or open surgical techniques. The management strategy should consider the aneurysm type (true or pseudo-aneurysm), location, size, rupture status, vascular anatomy, and patient condition. Our review of the literature showed that extracranial OA aneurysms are more likely to be treated using endovascular embolization or trapping with excision.^[2,7,8] Whereas for intracranial aneurysms, treatment included coil embolization or microsurgical clipping.^[9,10] Moreover, no clear consensus concerning the optimal treatment paradigm could be gleaned from the reported cases.

In our case, we decided to embolize the aneurysm and the parent vessel because of the aneurysm location and

morphology, which precluded preserving the parent vessel. Furthermore, the balloon test occlusion of the OA showed cross filling of the left lower cerebellar hemisphere through the PICA, which indicated that the likelihood of developing a fulminant cerebellar stroke is exceptionally low.

Although rare, OA aneurysms should be considered in cases of subdural hematoma of the posterior fossa, pulsatile scalp mass or neck mass, or nontraumatic neck hematoma. Both endovascular and open surgical techniques are effective for treating these aneurysms.

CONCLUSION

Intracranial OA aneurysms are extremely rare and frequently present with subdural hematoma. The etiology remains elusive, but there appears to be an association with increased flow demand. The management of these aneurysms includes both endovascular and or open surgical techniques and depends on several factors such as the aneurysm characteristics, patient condition, rupture status, and others.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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