

OTORRHAGIA AS THE INITIAL PRESENTATION OF AN INTERNAL CAROTID ARTERY ANEURYSM IN THE MIDDLE EAR. CASE PRESENTATION

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Abstract

Middle ear aneurysms are rare and difficult to treat. The case of a 50-year-old female who presented with left otorrhagia caused by an internal carotid aneurysm is reported. She had no medical history of tinnitus, vertigo, otalgia or otorrhea. Middle ear surgery was effective in resolving bleeding and did not cause any permanent neurological deficit. High resolution computed tomography angiography is the technique of choice and, in some cases, can be complemented with a magnetic resonance angiography. Misdiagnosis of the internal carotid artery aneurysm may lead to serious morbidity because of bleeding or vascular occlusion. The use of modern imaging techniques explain the current relative increase in frequency.

Keywords: otorrhagia, middle ear, internal carotid artery, aneurysm

Introduction

Aneurysms of the internal carotid artery (ICA) in the middle ear are uncommon vascular anomalies [1,3] and are difficult to detect and treat [2]. They can present with a variety of symptoms or be asymptomatic. Pulsatile tinnitus is a common symptom [3,4]. The causes of aneurysms are multiple and include atherosclerosis and dysplastic, traumatic, and infectious lesions. Differential diagnosis should include a glomus tumor (tympanic, jugular or both), or other vascular temporal bone lesions such as a dehiscent jugular bulb, cholesterol granuloma, petrous carotid aneurysm, pseudoaneurysm, arteriovenous malformations or hemangioma [2]. Otoscopy may reveal a normal tympanic membrane with a mass in the middle ear that, in some cases, is pulsating. Imaging studies are fundamental for diagnosis and can define the nature and origin of these lesions. High resolution computed tomography angiography (CTA) is the technique of choice and, in some cases, can be complemented with a magnetic resonance angiography (MRA). In this article we describe an asymptomatic case of aneurysm of ICA treated successfully by middle ear surgery.

Case report

A 50-year-old female was referred to the emergency room of ENT Department of Cluj-Napoca for massive left otorrhagia started a few hours before presentation. There was no medical history of tinnitus, vertigo, otalgia, or otorrhea, or any history of trauma or surgery of the head and neck. There was no significant personal or family medical history. The patient did not take chronic medication at home and did not declare allergies. Recent psychological trauma (death of her father) with high blood pressure of 210/100 mm Hg was revealed at presentation. Fresh blood flowed out from the left ear during a short period and hemostasis was accomplished with difficulty using compressive cotton balls. Release of the compress resulted in relapse of the bleeding. A micro-otoscopic examination of the left ear showed a perforation at the level of the antero-inferior quadrant of the tympanic membrane with a red pulsatile mass. An audiogram revealed a left-sided conductive hearing loss of up to 30 dB, whereas tympanometry showed a type C tympanogram with a low amplitude. The right ear was with normal anatomy and hearing. Examination of other systems was unremarkable. Computed tomography angiography (CTA) showed an aneurysm of the internal carotid artery protruding into the middle ear and a massive hematoma of the mastoid cells. After the patient had been

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Case Report

given a thorough explanation about the risks of ICA injury during surgery, she provided an informed consent, and middle ear surgery was performed. The operation was carried out via a retroauricular approach under general anesthesia. A partial mastoidectomy canal wall down with evacuation of the left middle ear hematoma was performed (Figure 1). A complete package of the middle ear and the mastoid cavity with Merocel, Surgicel, Gelfoam and temporalis muscle fascia and a left anterior and posterior nasal package was also performed during surgery. After three days the patient underwent another computed tomography angiography. A complete obstruction by a massive thrombus of the left internal carotid artery at 1.2 cm from the bifurcation to clinoid area was revealed without any focal neurological deficits or stroke (Figure 2). The anterior and posterior nasal package was suppressed two days after surgery. The post-operative recovery was good. After one week the patient was released from hospital. The follow-up magnetic resonance angiography (MRA) 6 months later revealed the thrombosis of the left ICA with new collateral vascularization in the left cerebral territory of ICA by circle of Willis (Figures 3 and 4).



Figure 1. Axial computed tomography revealing the left mastoid cavity after middle ear surgery.



Figure 2. Computed tomography angiography showing the complete obstruction of the left ICA.



Figure 3. Magnetic resonance angiography six months follow up with new collateral vascularization.



Figure 4. Coronal section of MRA six months follow-up showing the obstruction of left ICA.

Discussion

Aneurysms of the extracranial ICA are rare. The preponderance of men is clear in the literature, with a male/female ratio of 2:1.3 [3]. The different causes and especially the traumatic lesions explain the relatively young age of this population, 56 years old [3]. Aneurysms of the extracranial carotid artery can be partially or completely thrombosed, can cause distal embolization, or compression of adjacent structures, and can be ruptured [7]. Before the introduction of antibiotics, infection was the main cause. In the most recent publications that report the experience of Moreau et al. [5] (published in 1994) and Rosset et al. [6] dysplastic lesions appeared to be the main cause of aneurysms of the ICA. In the experience of Lotina et al. [7] most of the true extracranial carotid artery aneurysms are of atherosclerotic origin. Depending on the size and location of the aneurysm, the direction of its growth, and the specific adjacent structures involved, patients may or may not present signs and symptoms. Our patient presented

with only otorrhagia, no other otological signs. However, rupture of the aneurysm could have caused epistaxis through the eustachian tube. Direct compression or anterior and posterior nasal package may not be able to stop the bleeding. In that situation a patient may enter a critical condition following hemorrhagic shock or respiratory failure. In our case, ear packing was a useful procedure for initial temporary hemostasis for acute ear bleeding. The cause of the ICA aneurysm remained undetermined. A dysplastic or atherosclerotic lesion could be involved in this case. The appropriate management strategy for these rare lesions is unclear. In the cases reported until now most patients were treated with revascularization of the carotid artery using vein bypass grafts to reduce the risk of acute ischemic complications, but there are also cases treated without vascularization [8]. Successful treatment usually involves selective aneurysm embolization or carotid closure with detachable balloons. In our case middle ear surgery was effective in resolving bleeding and did not cause any permanent neurological deficit. Because of the high blood pressure and the thrombosis of the left ICA after surgery an antihypertensive (Enalapril 10 mg) and antithrombotic (Aspirin cardio 100 mg) chronic medication was mandatory in this case.

Conclusion

Aneurysms of the ICA in the middle ear are rare and difficult to treat because the anatomy of the region and life threatening complications after surgery. Clinical diagnosis is difficult because symptoms and signs are often nonspecific or absent. Otologists should be aware that symptoms and signs such as pulsatile tinnitus, conductive hearing loss, and a pulsatile retrotympanic mass in the anteroinferior part may be related to an ICA aneurysm. Results from audiometric evaluation may be normal or show a conductive hearing loss. Thus, ICA aneurysm, which is asymptomatic most of the time, will be diagnosed during middle ear surgery or a routine otoscopy or complications like otorrhagia. However, given the associated clinical relevance they represent a diagnostic and therapeutic challenge. The use of modern imaging techniques explains the current relative increase in frequency. Misdiagnosis of the ICA aneurysm may lead to serious morbidity because of bleeding or vascular occlusion. Long-term follow-up is necessary to look out for delayed post treatment complications.

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Case Report

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