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Case Report
Carotid Artery

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Unmasking The Culprit – Pseudoaneurysm of Petrous Internal Carotid Artery

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Pseudoaneurysms of the petrous internal carotid artery are rare. This is the case of a patient who presented with intermittent episodes of profuse bleeding from the left nostril and pulsatile tinnitus. Digital subtraction angiography (DSA) showed a pseudoaneurysm from the left petrous internal carotid artery which was promptly treated with balloon-assisted coiling.

Keywords: Pseudoaneurysm, epistaxis, internal carotid artery, balloon occlusion test, endovascular coiling

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Introduction

Pseudoaneurysms of the petrous internal carotid artery are rare and result from head trauma, radiation therapy [1], surgical complications, tumour invasion, fibromuscular disease and chronic otitis media [2], [3].

Most cases are discovered incidentally on computed tomography (CT) scans. Management depends on the clinical presentation of the patient and the various options include close observation, trapping with endovascular balloon occlusion, proximal occlusion, coil embolization or stent placement with or without coil embolization, surgical trapping and revascularization through a high-flow bypass [4]

Case Report

A 69-year-old female with a history of hypertension, coronary artery disease and recurrent episodes of left ear discharge since childhood presented with intermittent episodes of profuse bleeding from the left nostril associated with pulsatile tinnitus of two weeks duration. Nasal endoscopy revealed bleeding through the left eustachian tube (ET) orifice and otoendoscopy of the left ear showed bloodstained pulsatile discharge from medium central perforation (Fig 1).

Bleeding and coagulation parameters were normal. Computed tomography of the nose and paranasal sinus was normal. HRCT Temporal bone showed a vascular lesion arising from the left internal carotid artery (ICA). Digital Subtraction angiography revealed a pseudoaneurysm of the left petrous internal carotid artery with severe narrowing of the lateral segment of ICA distal to aneurysm (Fig 2).

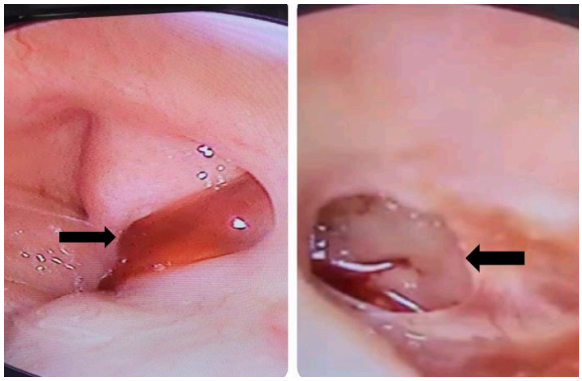

Figure 1: Nasal endoscopy and Otoendoscopy of left ear.

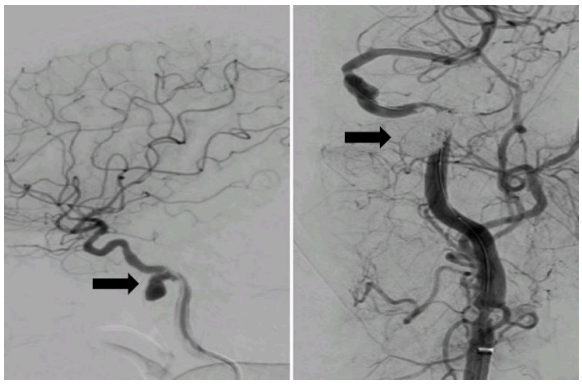

Figure 2: DSA pre and post-endovascular coiling

A balloon occlusion test was done to assess the contralateral blood flow before parent artery occlusion and was found to be normal. The patient underwent near complete coiling of the left petrous internal carotid artery (Fig 2) achieving a residual filling of class 2 according to Modified Raymond Roy classification10. Post-procedure Doppler was normal.

Discussion

Cervical ICA becomes the petrous segment as it enters the petrous temporal bone at the base of the skull anterior to the internal jugular vein and medial to the styloid process. Aneurysms arising from the petrous segment of ICA are rare. It can be true or pseudoaneurysm. Pseudoaneurysm occurs as a result of blood leakage from the injured site and is contained in a fibrous tissue capsule [5]. Such an injury occurs as a result of blunt or penetrating trauma, inflammatory reactions or infections. Infectious causes can be otomastoiditis, pharyngeal and tonsillar infections and cholesteatomas. Some cases can be congenital in origin.

It is usually asymptomatic and is diagnosed incidentally on imaging. Other presentations can be ear bleed, epistaxis, pulsatile tinnitus, facial numbness, dizziness, hearing disturbances or cranial nerve disorders [6]. CT Angiography or Magnetic Resonance Angiography are common imaging modalities, whereas DSA forms the gold standard [7].

The primary goal of treatment is to provide symptomatic relief and to minimize the risk of hemodynamic compromise [8]. Since they are secured by petrous bone, open surgical techniques are challenging and endovascular techniques are more advantageous.

Endovascular surgical approaches include balloon embolization, stand-alone stenting, coil embolization or stent-assisted coiling [9], [10]. The outcome of treatment depends on the anatomy of the segment involved, collateral flow to the brain and age of the patient.

Conclusion

Diagnosis and treatment of pseudoaneurysm of the petrous internal carotid artery is challenging. The proximity between the petrous internal carotid artery and the eustachian tube should be kept in mind for early diagnosis and prompt management in patients presenting with epistaxis.

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