

Case Report

Resolution of persistent trigeminal artery aneurysm by coil embolization

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ABSTRACT

The persistent trigeminal artery (PTA) is the most common and most cephalic embryological vascular remnant that persist in the adulthood. It is located between the internal carotid artery and the basilar artery. It is recognized on 0.1%–0.6% of cerebral angiography. In most cases is an incidental finding, but may be associate with others cerebrovascular malformations, including arteriovenous malformations, aneurysms, and carotid-cavernous fistulas, which cerebral aneurysms are the most common. We describe an extremely rare case of unruptured aneurysm in the PTA trunk revealed by angiotomography successfully treated with endovascular embolization. A proper diagnose prior to any surgical or radiological intervention is crucial to prevent possible complications.

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The persistent trigeminal artery (PTA) is a very rare anastomosis located between the internal carotid artery (ICA) and the basilar artery and is recognized on 0.1%–0.6% of cerebral angiography [1] with a higher prevalence in females [2]. In most cases is an incidental finding, but may be associate with others cerebrovascular malformations, including arteriovenous malformations, aneurysms, and carotid-cavernous fistulas. Aneurysms associated to PTA are relatively frequent, and account for 14% of all cerebral aneurysms [3], although aneurysm arising from the trigeminal artery itself are extremely rare. We describe a case of unruptured aneurysm in the PTA trunk revealed by angiotomography successfully treated with endovascular embolization.

1. Case report

A 56-year-old woman with a history of diabetes type 2, hypertension and dyslipidemia presented to our institution with headache and nausea of 1 month of evolution. She suffered a traumatic brain injury without loss of consciousness 3 months prior to come to our hospital. A cranial computed tomography (CT) scan was initially performed revealed a saccular vascular projection of the basilar artery (Fig. 1). The patient therefore underwent CT-angiography (CTA), showing a left persistent trigeminal artery measuring 3.8 mm in diameter and a saccular aneurysm arising from the left-PTA, adjacent to the union with the basilar trunk, measuring 15 × 12.6 mm of diameter (Fig. 2). The aneurysm

occupied the peritrunal cistern at the interpeduncular level. The vertebrobasilar system proximal to the aneurysm was hypoplastic and the posterior communicating artery were absent bilaterally. Due to the size of the aneurysmal and the age of the patient, we decided an endovascular treatment. The existence of perforating arteries associated to the PTA made us initially think in placing a flow diverter, but the little post-aneurysmal space of the trigeminal artery, prior to its union with the basilar artery, would have made it difficult to anchor, so we chose an embolization with coils (Trufill DCS orbit Detachable Codman J & J). The patient tolerated successfully the endovascular procedure and had a great evolution. At a follow-up 6 months after the surgery digital angiography demonstrated sustained embolization of the aneurysm with no recanalization (Fig. 3).

2. Discussion

PTA is the most cephalic and most common embryological vascular remnant that persist in the adulthood. It originates in the precavernous segment of the ICA, proximal to the origin of the meningohypophyseal trunk, to anastomose with the distal third of the basilar artery [4].

Uchino et al. [5] divided the PTA into medial and lateral types, both with a similar prevalence. The medial type courses posteromedially through the cavernous sinus. The lateral travels between the trigeminal nerve and the lateral side of the cavernous sinus to join the basilar artery between the origins of the anterior inferior cerebellar arteries and the superior cerebellar arteries. Due to the intimate relationship of PTA to the trigeminal nerve, it is an unusual cause trigeminal neuralgia [3]. In our patient, CTA demonstrated that the PTA was lateral type.

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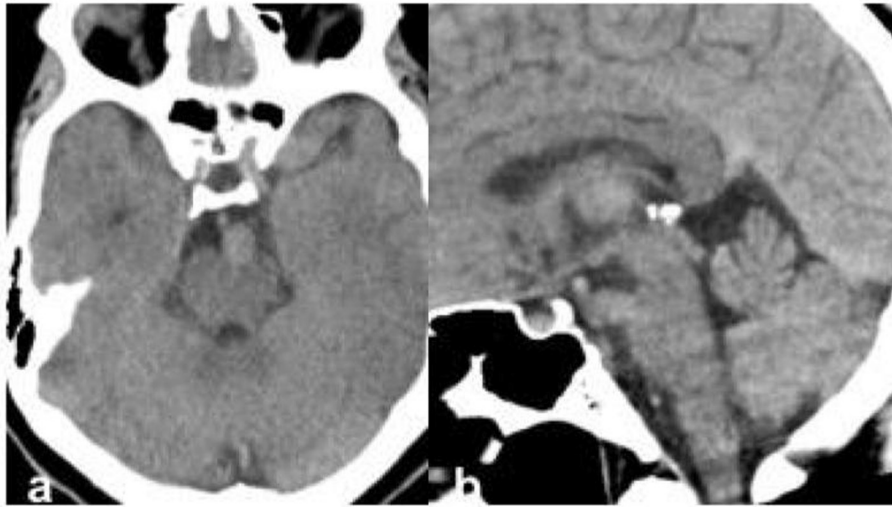


Fig. 1. Computed tomography scan without contrast. Axial plane (a) where a slightly hyperdense saccular lesion is seen in the prepontine cistern, with a slight imprint on the protuberance. Sagittal plane (b) that shows the close relation with the superior sector of the basilar trunk.

PTA was also characterized according to the configuration of the posterior cerebral artery [6]: In two types: Saltzman type I there is an agenesis of the ipsilateral posterior communicating artery; and Saltzman type II there is a variant of fetal origin of the posterior cerebral artery that originates directly from the ACI, and the ipsilateral segment P1 is absent. Our patient's PTA would therefore be classified as a lateral

variant Saltzman type 1. Besides, the proximal segment of the vertebrobasilar system in our patient is hypoplastic and the posterior communicating arteries are absent bilaterally. Secure flow preservation is very important in patients treated for PTA trunk aneurysms because insufficient flow in the main trunk of the PTA can compromise the posterior circulation and generate significant post-treatment sequelae.

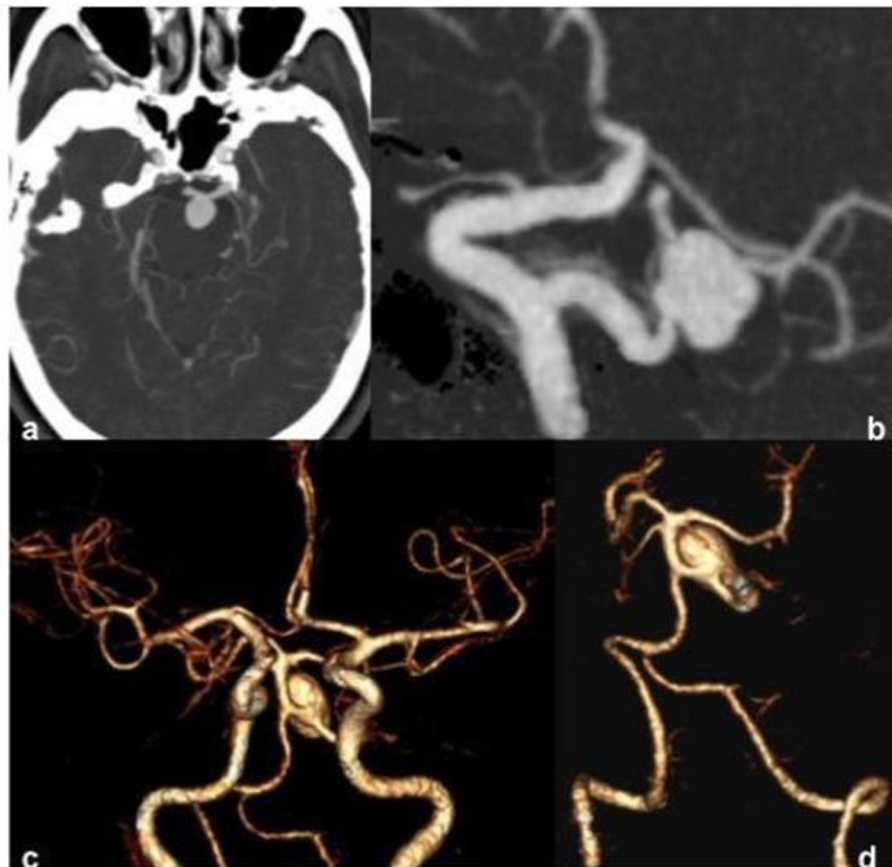


Fig. 2. Intracranial angiotomography. Axial plane (a) shows sacular dilation dependent on the left trigeminal trunk with imprint on the protuberance. Multiplane reconstruction of maximum intensity (b) and volumetric reconstructions (c and d) showing the persistent left trigeminal artery associated with aneurysmal dilatation.

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