A DISTAL AICA ANEURYSM

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Aneurysms of the posterior fossa have been reported to account for 8 to 12% of all intracranial aneurysms[1-3]. Among these aneurysms, those of the distal AICA (anterior inferior cerebellar artery) are exceedingly rare, fewer than 100 cases have been reported, with a reported incidence of 0.1–0.5%[4]. Of the major arteries of the posterior fossa, the AICA is the least likely to harbor an aneurysm[5]. In Locksley's review of the first cooperative aneurysm study[6], only two cases of AICA aneurysms were found among 7933 lesions. Schwartz[7] reported the first surgically treated case of an AICA aneurysm in 1948. Since then few cases of distal AICA aneurysms have been reported.

We describe one case of distal AICA aneurysms highlighting diagnostic and therapeutic nuances.

Fig 1. CT scan showing a Fisher grade IV subarachnoid hemorrhage. Notice blood within IV ventricle.

CASE

A female, 45 years old, was brought to the emergency room from an outlying hospital where she had been admitted after suffering a sudden onset of severe headache, nausea, and vomiting. On admission, she was alert and had no neurologic focal deficits. The patient's condition was categorized as Grade 1 (Hunt-Hess). A computed tomography (CT) scan demonstrated a Fischer grade IV SAH with blood sediment within the fourth ventricle (Fig 1). Four-vessel digital subtraction angiography revealed a 9 mm in diameter saccular aneurysm located at the meatal loop of AICA (Fig 2). Wash out of the contrast medium was markedly delayed suggesting that the arterial blood flow was slow in the aneurysm sac (Fig 2).

A conventional retrosigmoid approach was carried out. At surgery, a distal AICA aneurysm was seen posteriorly to the seventh and eighth cranial nerves, causing displacement of the rootlets of the IX cranial nerve (Fig 3). The aneurysm sac presented very tiny wall, resembling a pseudoaneurysm, and no aneurysm neck was identified (Figs 3 and 4). The labyrinthine artery was individualized (Figs 3 and 4) and the aneurysm was trapped using two aneurysm clips (Fig 4). Due to the intimate relationships with the rootlets of the IX cranial nerve, the aneurysm sac was not incised precluding a histopathologic diagnosis of a pseudoaneurysm. Postoperatively, the patient was neurologically intact with no deficits either in the hearing or labyrinthine function.

She has consented with this publication.

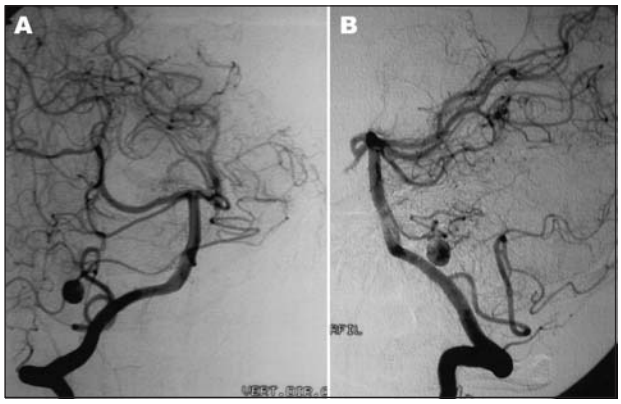

Fig 2. Rigth vertebral angiogram depicting a distal AICA aneurysm. No neck may be individualized and aneurysm filling is very slow. (A) Oblique view; (B) Lateral view.

ANEURISMA DISTAL DA AICA

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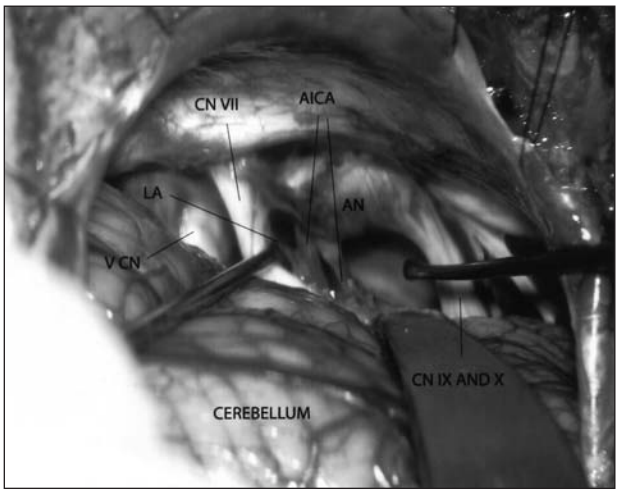

Fig 3. Microsurgical view trough a retrosigmoid approach. Aneurysm (AN) may be identified near cranial nerve VII (CN VII). Segments of AICA distal and proximal to the aneurysm may be visualized. Labirinthyne artery (LA) is dissected proximal to the aneurysm. CN V; cranial nerve V; CN IX and X; cranial nerves IX and X.

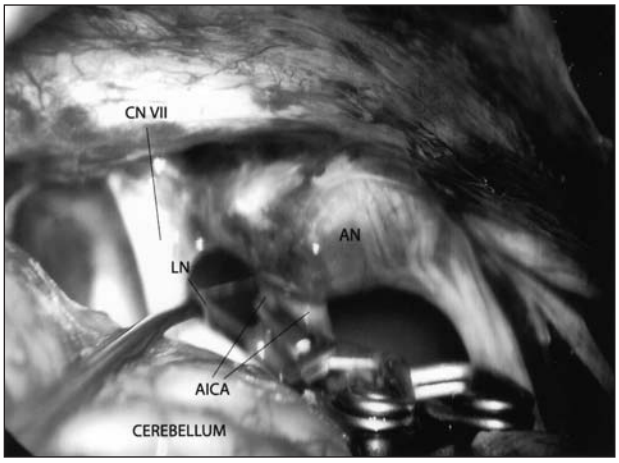

Fig 4. Two aneurysms clips have been applied to trap the aneurysm (AN). Labirinthyne artery (LA) has been saved. CN VII; cranial nerve VII.

DISCUSSION

In a recent literature review, it was found that 81 patients had 84 peripheral AICA aneurysms, including three patients with multiple distal AICA aneurysms[8-10]. Peripheral AICA aneurysms occurred predominantly in women (51 women, 21 men, 10 sex unknown); patient ages ranged from 17–81 years (mean 48.2 years), with 76.2% of aneurysms located in the meatal segment of the AICA[9].

The anatomy of the AICA is highly variable[11-14]. Typically, the artery arises from the junction between the middle and lower thirds of the basilar artery, courses along the pons and the middle cerebellar peduncle (to which it gives a few perforating branches), then bifurcates into two major branches, called the (rostro) lateral branch and the (caudo) medial branch. The rostrolateral branch courses close to the seventh and eighth cranial nerve complex and gives off the labyrinthine, or internal auditory artery. It is at this point that most peripheral AICA aneurysms are located [5,9,14,15]. The caudomedial branch, in which aneurysms are seen only rarely, courses medially close to the pons, to which it sends a few perforators, and terminates in cerebellar branches. Patients with these aneurysms may present acutely with SAH or with symptoms of a mass lesion in the cerebello-pontine angle (CPA), including hearing loss, vertigo, tinnitus, facial weakness, diplopia, ataxia, or altered facial sensation.

The overall management of distal AICA aneurysms includes wrapping, proximal occlusion, trapping, intravascular embolization with coils, and direct surgical clipping. In a review of the literature, no single intervention proved more successful than any other in reversing preoperative deficits or preventing postoperative deterioration in the function of cranial nerves VII and VIII. The limited available information suggests a very low incidence of ischemic complications related to trapping distal AICA aneurysms close to the IAC (internal auditory canal), particularly if seventh and eighth cranial nerve dysfunction is present preoperatively. However, the literature on distal AICA aneurysms supports the notion that location of the lesion near the IAC is a negative prognostic factor for postoperative seventh and eighth cranial nerve function.

The most common treatment for distal AICA aneurysms is either clipping or trapping. Trapping is usually well tolerated; there are few reports of increased postoperative neurologic deficits. However, vessel repair or bypass should be considered in selected cases, yet it would be a difficult technical exercise in this location with a vessel segment of this diameter[14]. Some authors express concern that ligation or endovascular occlusion of the AICA may lead to ischemia by retrograde thrombosis of the trunk of AICA, resulting in impaired blood supply to the lateral middle and lower third of the pons and lateral upper third of the medulla[10]. Therefore, special attention should be exerted to identify branches of the AICA and their anastomoses with the SCA and PICA[8].

Our aneurysm presented features of a pseudoaneurysm, such as delayed wash out and low flow, absence of a well defined neck and tiny walls. However, as a histopathologic examination was not possible, the authors may not draw considerations in this concern. Furthermore, other cases of distal AICA aneurysms with delayed wash out have been reported.

In conclusion, since the literature on distal AICA aneurysms is scarce, it is difficult to create guidelines for management based on so few cases. Our general approach

is to select microsurgical intervention as a first choice, depending on the aneurysm's location, size, and configuration, as well as the patient's overall clinical condition. Currently, only microsurgical intervention has the potential to permanently obliterate these distal AICA aneurysms while preserving the parent artery.

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