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Case Report OMICS International

Posterior Inferior Cerebellar Artery Aneurysm: Surgical or Endovascular Treatment in a Case Report

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Abstract

Introduction: PICA aneurysms answer for 3% of all intracranial aneurysms. The patients generally present Hunt-Hess I or II and have intraventricular hemorrhage needing treatment.

Case presentation: This is a case study about an elderly woman complaining about a sudden headache. She had an aneurysm in the distal segment of the PICA, which was treated by clipping. The woman progressed well despite her hydrocephalus.

Discussion: Information about the aneurysm positioning and anatomy guided the therapeutic decisions. Age and clinical presentation are the most prominent factors in positive clinical evolution. An interdisciplinary team should choose between surgical and endovascular treatment.

Keywords: Posterior inferior cerebellar artery aneurysm; Surgical treatment; Endovascular treatment

Abbreviations: PICA: Posterior Inferior Cerebellar Artery Aneurysm

Introduction

15% of intracranial aneurysms occur in the posterior fossa, specifically in the PICA and at the basilar apex. PICA aneurysms represent 3% of intracranial aneurysms and have clinical manifestation by hemorrhage. They should be treated with surgery or endovascular treatment.

Case Presentation

A 69 years old woman was admitted complaining about sudden holocranial headache and nausea. She had a history of hypertension and diabetes mellitus and was not a smoker. Physical exam was in Glasgow 15 with a stiff neck, without nerve palsy, and with normal muscle strength.

Intraventricular hemorrhage in the fourth ventricle and right lateral ventricle was found by tomography (Figure 1).

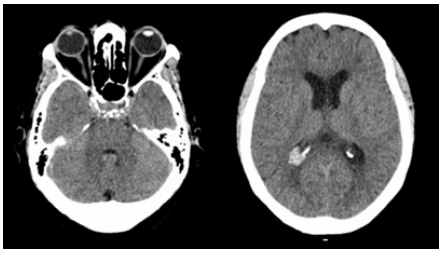

Figure 1: Cranial tomography post admission in emergency room showing intraventricular haemorrhage, IV ventricle and right lateral ventricle with bleeding.

In the angiotomography, we detected an aneurysm located in the left PICA (Figure 2).

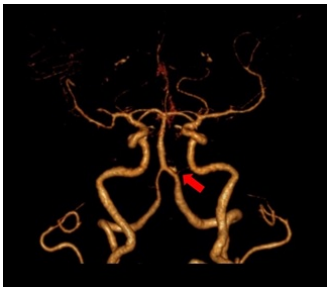

Figure 2: Angiotomography showing by arrow in the left PICA the aneurysm.

The case was admitted to a referral hospital in the intensive care unit, submitted to angiography where we could see the details of the aneurysm (Figure 3).

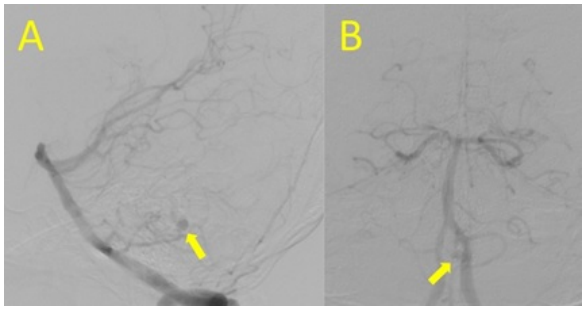

Figure 3: Digital angiography: posterior circulation vascularization in antero-posterior view (A) and lateral view (B) with left PICA aneurysm at the tip of the arrow.

After two weeks of admission, neurological condition was the same. The patient was submitted to surgical procedure.

The crew chose prone positioning and median sub-occipital craniotomy. First, one hematoma was drained in the posterior fossa and sub-pial left cerebellar tonsil aspiration was performed.

Following, the left PICA identification in the proximal to distal. The aneurysm in the distal segment of the PICA was clipped with two small strength clips (Figure 4).

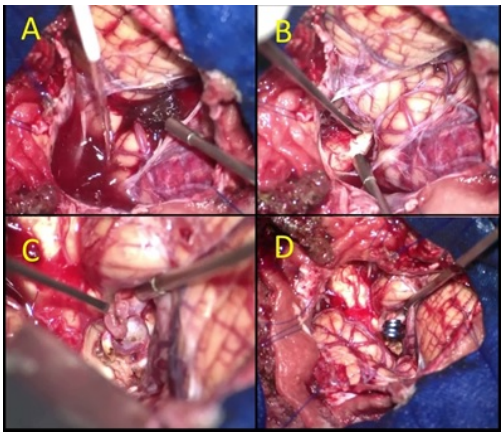

Figure 4: A: After opening the cistern magna it is possible to see the bleeding in between cerebellar tonsils; B: Subpial aspiration the left cerebellar tonsil; C: The aneurysm in distal site of the left PICA; D: after clipping with two small straight clips.

The patient went back to the intensive care unit and, after one week, showed a change in her degree of consciousness. An obstructive hydrocephalus was treated by external ventricular shunt improving the neurological status (Figure 5).

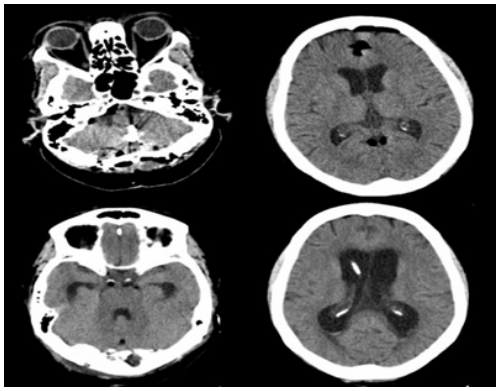

Figure 5: Upper the post-surgical CT scan and below after ventricular drainage.

Discussion

The PICA has five anatomical divisions: 1. Anterrior medullary segment; 2. Lateral medullary segment; 3. Tonsilomedullary segment; 4. Telovelotonsilar segment and 5. Cortical segment, which is subdivided into territories: the tonsil, vermis and the hemispheres [1-3].

Literature data indicate that 80% of the PICA aneurysms happen at the junction with the vertebral artery and 20% in the distal PICA (1). Vertebral-PICA junction aneurysms are approached by lateral craniotomy, and the distal aneurysms of the PICA by median sub-occipital craniotomy [4-14].

Once the aneurysm has been identified, operational or endovascular treatment should be performed. Strategy change - surgery and endovascular - is common during the treatment [2]. Posterior circulation aneurysms render a more positive change after embolization described in modified Rankin scale [2]. However, part of the advantage of endovascular treatment is the shorter time of its execution [2].

PICA aneurysms are uncommon and have a poorer clinical evolution owing to low cranial nerve dysfunction and hydrocephalus, especially in the distal segment [3]. Low cranial nerve palsy occurs through surgical manipulation and may lead the patient to tracheostomy and gastrostomy [3]. Hydrocephalus occurs as a consequence of both subarachnoid bleeding and hematomas in a surgical site contributing to ventricular shunting [3].

PICA aneurysms are mostly small, <7 mm, fusiform and saccular. They present bleeding with a significant danger of rebleeding, prompt treatment is necessary in these cases [4]. Hemorrhage is often intraventricular presenting a Fisher grade IV [4].

Both in endovascular treatment and in surgical treatment, the procedures involve occlusion of the aneurysm and occlusion of the PICA, mainly in the distal segments [4]. Data from the literature suggest surgical treatment because it allows safe clipping, which in turn preserves perforating arteries, revascularization, hematoma drainage or decompression if necessary [4]. In general, there are no important clinical consequences associated with collateral vessels [5].

Embolization for non-ruptured posterior circulation aneurysms have better clinical results but the recanalization and retreatment rates are about 5% [6-8]. If we bear in mind that a portion of the bad results happen because of the low nerves manipulation and because it takes longer until the procedure execution, we must indicate surgery only when a hematoma is present or decompression is needed [4,9].

The worst outcomes depend on the clinical state at the admission. Patients in Hunt-Hess IV and V have modified Rankin scale from 3 to 6 [7,8,15]. Patients with PICA aneurysms present Hunt-Hess II or I and yet Fisher grade of IV [10] as in the case we are describing.

Vascular morphology based on angio-tomography and digital angiography assists in the surgical indication [10,11]. The shape of the aneurysm, broad neck, vasospasm, small caliber and tortuosity of PICA are favorable to surgical treatment [11].

Although 80% of patients treated by endovascular techniques have satisfactory results, higher rates of incomplete occlusion and recurrence occur [6,7,11]. Otherwise, surgical treatment also presents high complication rates such as shunt dependence and low cranial nerve dysfunction due to manipulation [11-13].

However, considering multiple variables and low incidence of aneurysms in PICA, the decision for the type of treatment should involve an experienced multidisciplinary team [11]. As for the case described, the endovascular techniques involved embolization and occlusion the PICA. Thus, the team chose surgical treatment, as clipping, artery occlusion, or even anastomosis and hematoma drainage were possible in surgery [14].

Researchers report good surgical results for PICA distal aneurysms [12,14]. Although the patient in case has undergone aneurysm clipping and hematoma drainage without complications, hydrocephalus was identified postoperatively requiring shunt, as is the case for 30% of the patients [12].

Considering anatomical and morphological data obtained from diagnostic angiography, the decision may be endovascular treatment for the aneurysms in the proximal PICA and microsurgery for the distal segment [13].

However uncommon, the treatment for PICA aneurysms is widely discussed in the literature. The clinical outcomes are similar in the experiences reported and depend mainly on the initial clinical presentation, age, and the joint decision between endovascular and surgical teams [15].

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