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Case Report

A rare case report of ruptured distal pica aneurysm and complications

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ABSTRACT

Aneurysms of the distal PICA are rarely encountered and are challenging lesions prone for surgical rupture. PICA is the greatest of the branches of the vertebral artery, and is the causative vessel for aneurysm in the posterior cranial fossa. Common location of aneurysms of PICA is at its junction with vertebral artery. Aneurysms originating from more distant PICA segments are called distal aneurysms and are very rare, with a prevalence of 0.3%. Cerebral infarction and cranial nerve compression occur commonly with rupture of PICA aneurysm. CT angiography has been proposed superior to conventional angiography in patients with ruptured aneurysms presenting with SAH. Surgical treatment of PICA aneurysms depends on the sites of occurrence. Surgical aneurysm clipping and endovascular coiling are the available treatment options to prevent further complications. Here, we report a rare case of distal PICA aneurysm presenting with diffuse SAH and IVH.

Keywords: PICA, Aneurysm, SAH, IVH

INTRODUCTION

Aneurysms of the distal PICA are rarely encountered and are challenging lesions prone for surgical rupture. PICA is the greatest of the branches of the vertebral artery, and is the causative vessel for aneurysm in the posterior cranial fossa. Common location of aneurysms of PICA is at its junction with vertebral artery.[1]

CASE REPORT

An 81 year old elderly lady presented to the St Johns Hospital emergency with sudden onset severe headache. The patient was drowsy, had three episodes of vomiting and vision impairment. On examination the patient had papilledema, no neurological deficit was seen.

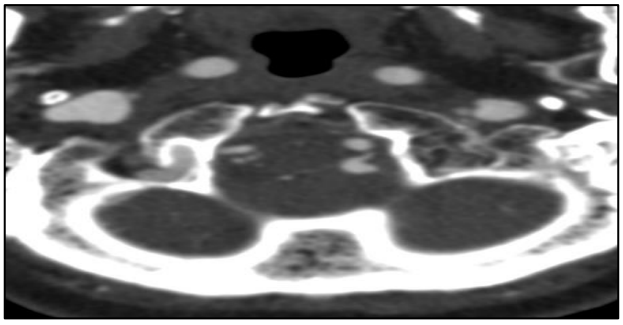

Figure 1: Axial contrast CT angiography MIP image showing well-defined out pouching arising from the posterior inferior cerebellar artery - s/o aneurysm.

A plain CT was done which revealed diffuse subarachnoid bleed with intraventricular extension (Fischer Grade IV), blood clot was seen in posterior fossa. The patient had no history of trauma. So, CT

angiography was done which revealed a well-defined round outpouching from the posterior inferior cerebellar artery about 4 to 4.5 cm from its origin.

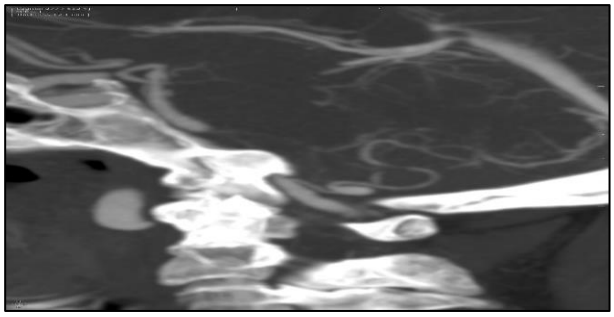

Figure 2: Sagittal contrast CT angiography MIP image showing distal pica aneurysm.

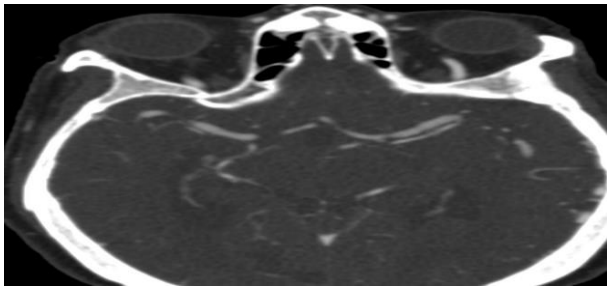

Figure 3: Axial contrast CT angiography MIP image showing bifurcation of left MCA.

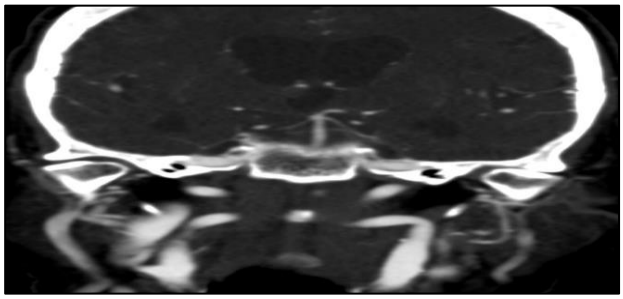

Figure 4: Coronal contrast CT angiography MIP image showing right sided fetal origin of PCA with hypoplastic p1 segment.

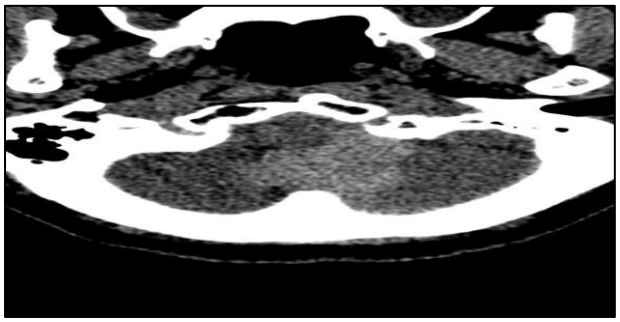

Figure 5: Subarachnoid bleed extending into fourth ventricle.

Figure 6: Intraventricular hematoma.

It also revealed anatomic variations like bifurcation of the left MCA and fetal origin of the right PCA with hypoplastic P1 segment.

DISCUSSION

Aneurysms are focal abnormal dilatation of a blood vessel. They are classified as saccular, fusiform and pseudoaneurysm. A saccular aneurysm also known as berry aneurysms is an eccentric outpouching involving a portion of the circumference of the vessel wall. Aneurysm is traditionally reported as being small (<15 mm), large (15-25 mm), giant (25-50 mm) and supergiant (>50 mm). Most aneurysms encountered in practice belong in first category, which has further been divided into small (<5 mm) and medium sized (5-15 mm) subcategories.[1] It is seen at the major branching points, caused due to weakness of the vessel wall due to hereditary factors or certain disease. Aneurysms have tendency to grow and rupture causing subarachnoid bleed. Other complications includes thromboembolic phenomenon, III, IV and VI cranial nerve palsies and symptoms related to local mass effect. IVH and hydrocephalus are commonly present with ruptured PICA aneurysms.

The PICA has the most complex, tortuous and variable course and supplying area, of all cerebellar arteries. PICA usually branches intracranially from the vertebral artery (17% branch extra cranially).[2-4] Huang et al classified the PICA into four segments, i.e., the anterior medullary, lateral medullary, posterior medullary and supratonsillar segments.[5] Based on its relationship to the medulla and cerebellum, the PICA can be divided in five segments the anterior medullary; the lateral medullary segment, the tonsillomedullary segment, the telovelotonsillar segment and cortical segment. Aneurysms of the posterior inferior cerebellar artery (PICA) are rarely encountered and constitute only 0.5-2% of total aneurysms in the brain.[6,7] The common location of aneurysms of PICA is at its junction with vertebral artery. Aneurysms originating from more distant PICA segments are called distal aneurysms and are very rare, with a prevalence of 0.3%.[8] PICA aneurysms are challenging lesions, prone to procedural rupture.

Reported incidence of isolated IVH in PICA aneurysm has been as high as 25%.[9,10] Conversely, SAH extending to the level of the cerebral convexity is a rare entity.

The combination of unenhanced CT images and CTA is a useful tool for identifying intracranial aneurysms. On unenhanced CT images, aneurysm detection is optimized by assessing the pattern of SAH distribution, site of most abundant clot, difference in density and presence of a calcified aneurysm. CTA allows identification of arterial irregularities, aneurysms related to the skull base, paraclinoid ICA, PICA and the cavernous sinuses. On CTA, measurements are most accurately made on source images, whereas direction of the aneurysm projection is best assessed with on MIPs or 3D renditions. Helical CT angiography has been proposed as a substitute for conventional angiography for patients with SAH.[11]

Treatment options of these aneurysms includes surgical and endovascular coiling. Surgical approach includes clipping of neck of the aneurysm, it is very challenging due to its proximity to brain stem, cranial nerves and risk for procedural rupture. A midline suboccipital or lateral approach by paramedian craniotomy is preferred, as superomedial retraction of the cerebellum is simple using this method.

Another treatment option is an endovascular coiling, pioneered in 1991 at UCLA by Guido Guglielmi. In this method a catheter is introduced through the femoral artery into the aorta and subsequently into the arteries of brain. Platinum coils are used to embolise and eliminate the aneurysm. When PICA originates from the sac, coil occlusion of the aneurysm including the PICA origin should be considered as it has favourable outcome. When patients present in a delayed time course after SAH or with unruptured aneurysms, surgical approaches may be a better alternative may be a better alternative in selected cases. In aneurysms presenting with mass effect, endovascular proximal vertebral artery occlusion may be sufficient to alleviate symptoms.

CONCLUSION

The prognosis of a ruptured aneurysm of a Posterior Inferior Cerebellar Artery is multifactorial and depends on size and position of the aneurysm, and the patient's age, medical history and neurological health. Young patients with Grade I or II subarachnoid bleed show better prognosis with treatment from older patients with higher grades of bleed. Almost two thirds of patients will have fatality or permanent disability. CT angiography is a good modality for both detection and therapy planning of intracranial aneurysms.

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