Posterior cerebral artery aneurysm

- Successful Emergent Open Stent Grafting for a Ruptured Aortic Arch Aneurysm:Report of a Case
- Tubridge flow-diverting stent for treatment of unruptured intracranial complex aneurysms
- Infected aneurysm of middle meningeal artery causing intracerebral hemorrhage: illustrative case
- Takayasu arteritis with a ruptured intracranial aneurysm in a pediatric patient: illustrative case
- The Impact of Intracranial Blood Clearance on Brain Edema as a Predictor of Delayed Cerebral Infarction Following Subararachnoid Hemorrhage
- Manipulation of intracranial arteries is associated with consistent vessel diameter reductions during microsurgical aneurysm clipping
- Safety and Effect of Flow Diverters in the Management of Large and Giant Unruptured Intracranial Aneurysms
- Illustrated step-by-step guide to stent-assisted coiling of wide-neck posterior inferior cerebellar aneurysm via a contralateral vertebral artery approach

Epidemiology

Aneurysms of the posterior cerebral artery (PCA) are rare and account for 0.7-2.3% of all intracranial aneurysms.

The majority are fusiform in shape.

Of the PCA aneurysms, P2 segment aneurysms are even rarer, with an incidence of about 0.3%.

Classification

1. Location-Based Classification

Posterior cerebral artery aneurysms are typically classified based on their location along the artery. The PCA is divided into several segments, and aneurysms can occur in different segments:

P1 Segment: This segment runs from the termination of the basilar artery to the posterior communicating artery. Aneurysms in this segment are often located at the junction of the PCA and the posterior communicating artery.

P2 Segment: This segment extends from the posterior communicating artery to the bifurcation into the P3 and P4 segments. Aneurysms in this area are less common and may be related to branches supplying the midbrain and thalamus.

P3 Segment: Extends from the bifurcation of the PCA to the posterior choroidal artery. Aneurysms in this segment are rare and are typically associated with branches supplying the choroid plexus and the occipital lobe.

P4 Segment: This segment includes the cortical branches of the PCA. Aneurysms in this location are rare and usually involve distal cortical branches.

P2-P3 junction aneurysm of the posterior cerebral artery

see P2-P3 junction aneurysm of the posterior cerebral artery

Case series

From September 2012 to October 2014, Kawashima et al. retrospectively identified 3 patients harboring a fusiform PCA aneurysm (P2 segment aneurysm) who underwent trapping of the aneurysm and reconstruction of the distal PCA through the same subtemporal approach. They analyzed immediate morbidity, surgical complications, and the patency of the bypass to determine the feasibility of this procedure.

All 3 patients underwent successful trapping of the fusiform PCA aneurysm and revascularization of the distal PCA. The origin of P3 segment or posterior temporal artery (PTA) served as recipient arteries. In all 3 cases, adequate blood flow was evident after performing the STA-P3/PTA bypass. None of the patients experienced a new permanent neurological deficit. At 1-year follow-up, the STA-PTA/PCA bypasses remained patent.

The STA-P3/PTA bypass through the subtemporal approach is a feasible option to maintain blood flow in cases of PCA fusiform aneurysms requiring trapping of the P2 segment [1].

Case reports

A 31-year-old female presented to our hospital with sudden headache and altered consciousness. Computed tomography showed left acute subdural hematoma, and digital subtraction angiography revealed a small aneurysm on the left distal posterior cerebral artery. Coil embolization was conducted, and the patient was discharged with no neurological deficits. However, two weeks later, she presented with complete left hemiplegia and with the National Institutes of Health Stroke Scale of 20. Magnetic resonance angiography showed the occlusion of right middle cerebral artery, and the Diffusion-Weighted Imaging-Alberta Stroke Program Early Computed Tomography Score was four. Mechanical thrombectomy was conducted. Complete recanalization was achieved, and the patient recovered favorably. Although she showed no symptoms of infection such as fever throughout the treatment of aneurysm and thrombectomy, her blood culture was positive for streptococcus mitis. Furthermore, the thrombus retrieved by thrombectomy showed bacterial mass, and transesophageal echocardiography (TEE) showed vegetation on the mitral valve that could not be detected by transthoracic echocardiography. Therefore, the patient was diagnosed with infective endocarditis (IE). She was administered penicillin for 6 weeks and was discharged with no neurological deficits. When treating young patients with small aneurysms in rare locations, IE should be suspected, and blood culture and TEE should be conducted, even when there are no obvious symptoms of systemic infection [2].

2016

A case of a giant aneurysm of the posterior cerebral artery in a 10-year-old boy presenting with subarachnoid hemorrhage. Endovascular treatment with platinum coils was performed with total

occlusion of the aneurysm and the affected arterial segment without complications. The patient achieved good recovery, and a late control angiogram confirmed exclusion of the aneurysm. Occurrence of special features of cerebral aneurysm in children, in comparison to adults, is also described. Parent artery sacrifice is an effective therapeutic option, but long-term follow-up is necessary to avoid recurrence and rebleeding [3].

2014

A case of posterior cerebral artery aneurysm, which caused the isolated trigeminal neuralgia in a 48-year-old woman, was operated on through microvascular decompression and the aneurysm was wrapped [4].

2000

A case of an incidental, nonruptured posterior cerebral artery aneurysm, which was successfully occluded by coil embolization after a bypass between the occipital artery and the distal posterior cerebral artery was created. MR imaging in a neurologically normal 26-year-old man, performed in the course of a work-up for nonrelated symptoms, incidentally revealed a partially thrombosed and calcified aneurysm of the left posterior cerebral artery (P2 segment). This was confirmed by angiography. Due to aneurysm configuration and localization in the asymptomatic patient, primary clipping or endovascular occlusion was considered to be too hazardous. Four weeks after successful microvascular connection of the left occipital artery to the distal posterior cerebral artery, the PCA was occluded at the level of the aneurysm with a detachable coil. The patient remained asymptomatic, without visual field defects. The above presented combined microvascular (bypass) and endovascular (coil embolization) treatment with excellent result should be considered as alternative in patients with nonruptured, asymptomatic P2 aneurysms, which are high risk for primary clipping or endovascular occlusion [5].

Videos

Left temporal craniotomy for clipping of fusiform aneurysm of posterior cerebral artery

<html><iframe width="560" height="315" src="https://www.youtube.com/embed/l7yzUPsaMc4" frameborder="0" allowfullscreen></iframe></html>

1)
Kawashima A, Andrade-Barazarte H, Jahromi BR, Oinas M, Elsharkawy A, Kivelev J, Kubota Y, Kawamata T, Hernesniemi JA. Superficial Temporal Artery: Distal Posterior Cerebral Artery Bypass through the Subtemporal Approach: Technical Note and Pilot Surgical Cases. Oper Neurosurg (Hagerstown). 2017 Jun 1;13(3):309-316. doi: 10.1093/ons/opw033. PubMed PMID: 28521345.
2)
Matsuhashi A, Dofuku S, Koizumi S, Nakamura R, Narasaki H, Kazama K, Yonekura I, Imai H. A Rare Case of Ruptured Distal Posterior Cerebral Artery Aneurysm Followed by Middle Cerebral Artery Occlusion due to Delayed Diagnosis of Infective Endocarditis. NMC Case Rep J. 2024 Aug 10;11:221-225. doi: 10.2176/jns-nmc.2024-0095. PMID: 39224240; PMCID: PMC11368417.
3)
Demartini Z Jr, Matos LA, Dos Santos ML, Cardoso-Demartini AA. Endovascular Therapeutic Occlusion

of the Posterior Cerebral Artery: An Option for Ruptured Giant Aneurysm in a Child. Pediatr Neurosurg. 2016 Mar 15. [Epub ahead of print] PubMed PMID: 26974558.

4)

Dzierżanowski J, Słoniewski P. Trigeminal neuralgia caused by aneurysm of the posterior cerebral artery: a case description and the analysis of anatomical variety of vascular complex in the rood entry zone of trigeminal nerve. Folia Morphol (Warsz). 2014;73(2):224-228. doi: 10.5603/FM.2014.0033. PubMed PMID: 24902103.

5)

Korinth MC, Thron A, Bertalanffy H, Gilsbach JM. Coil embolization of an incidental posterior cerebral artery aneurysm after initial OA-PCA bypass surgery. Zentralbl Neurochir. 2000;61(3):158-61. PubMed PMID: 11189888.