Basilar artery aneurysm

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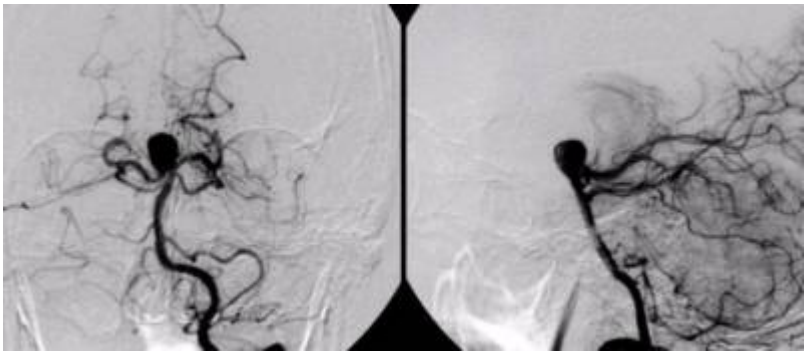

Definition

Posterior circulation intracranial aneurysm of the basilar artery.

Classification

see Basilar artery aneurysm classification.

Etiology

The angle widens with age during adulthood, especially in females. This angular widening is associated with basilar bifurcation aneurysms and may predispose individuals to aneurysm initiation by diffusing the flow impingement zone away from the protective medial band region of the flow divider.

Clinical features

The clinical features of a basilar artery aneurysm can vary depending on the size, location, and severity of the aneurysm.

Some common clinical features of a basilar artery aneurysm include:

Headaches: Patients may experience severe and persistent headaches, which can be accompanied by nausea and vomiting.

Vision problems: A basilar artery aneurysm can cause visual disturbances, such as double vision, blurred vision, or partial vision loss.

Neurological deficits: Aneurysms can affect the functioning of the brainstem, leading to neurological symptoms such as numbness, weakness, or paralysis on one or both sides of the body.

Difficulty with coordination and balance: Aneurysms can also affect the cerebellum, which is responsible for coordination and balance. Patients may experience difficulty walking or performing fine motor tasks.

Speech and language problems: A basilar artery aneurysm can affect the areas of the brain responsible for speech and language, leading to difficulty speaking or understanding language.

Seizures: In some cases, a basilar artery aneurysm can cause seizures.

Loss of consciousness: In severe cases, a ruptured basilar artery aneurysm can cause loss of consciousness and coma.

Rare: Painful ophthalmoplegia

Differential diagnosis

see Colloid cyst.

Treatment

Basilar artery aneurysm treatment.

Complex basilar aneurysms

(large size, wide base, low bifurcation, and dysmorphic posteriorly projecting domes) frequently fail endovascular treatment.

With the pretemporal transzygomatic transcavernous approach, temporary clips are applied to a perforator-free zone of the basilar trunk, proximal to the superior cerebellar artery.

In the series of Krisht et al. complexity criteria in the 50 aneurysms included large or giant size in 27 patients, wide dysmorphic base in 18 patients, low bifurcation in 21 patients, posteriorly projecting dome in 11 patients, and dolichoectasia of the apex in three patients.

Twenty-five patients presented with subarachnoid hemorrhage. There were 14 men and 36 women between the ages of 32 and 76 years (mean, 52.2 yr). Forty-nine aneurysms (98%) were successfully clipped. There was no procedure-related mortality. Two patients died (one from delayed bowel ischemia and one from a vasospasm-related complication). There were three ischemia-related events, two of which were procedure-related (medial thalamic lacunar infarct, superior cerebellar distribution ischemia) and one which was a third distal middle cerebral cardiac embolus after stopping Coumadin (DuPont Pharmaceuticals, Wilmington, DE) for atrial fibrillation. Transient partial or complete occulomotor palsies occurred in all patients with full recovery as the rule, except in one patient. At discharge, Glascow Outcome Scale scores were 4 or 5 in 88% of the patients. At the 6-month follow-up examination, Rankin Outcome Scale scores were 0 to 2 in 92% of the patients.

The experience reintroduces microsurgery as a safe and more durable treatment option for the management of complex basilar apex aneurysms that tend to have a higher rate of failure with endovascular therapy [1].

Case series

see Basilar artery aneurysm case series.

Case reports

A 70-yr-old woman presented with acute onset headache, nausea, and vomiting. A computed tomography (CT) head demonstrated a hyperdense prepontine mass which was further characterized as a partially thrombosed basilar aneurysm on CT angiography. After multiple failed attempts to access the vertebral artery via femoral and radial access the patient was taken to the operating room (OR) for surgical exposure of the right V1 segment and direct cannulation of the vertebral artery. The aneurysm was successfully coiled and the vertebral artery closed primarily. The patient was discharged home without any neurological deficits.

Partially thrombosed mid-basilar aneurysms are difficult to treat both surgically and endovascularly. Endovascular access to the aneurysm was very challenging requiring direct exposure and cannulation of the V1 segment to successfully embolize with coils and discuss the technical limitations of this approach [2].

Case reports from the HGUA

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Male, 66 years old. aneurysmal subarachnoid hemorrhage (SAH) with Fisher scale Grade IV.

Computed tomography angiography reveals a partially thrombosed basilar aneurysm.

Endovascular treatment with simple coiling. Aneurysm Morphology: Saccular, Neck: 3mm, Maximum Diameter: 5.2 mm. Other Findings: No significant vasospasm. Incidental finding of a 2mm AcomP I infundibulum, not suggestive of rupture. Marked AVD hypoplasia with pronounced AVI dominance and loop at its origin.

Raymond-Roy Occlusion Classification: Grade 1 (complete occlusion).

Intravenous Heparinization: 4000 IU of heparin after the placement of the 2nd coil. Antiplatelet Therapy: None Nimodipine: Administered through a catheter in the AVI from Envoy 6F.

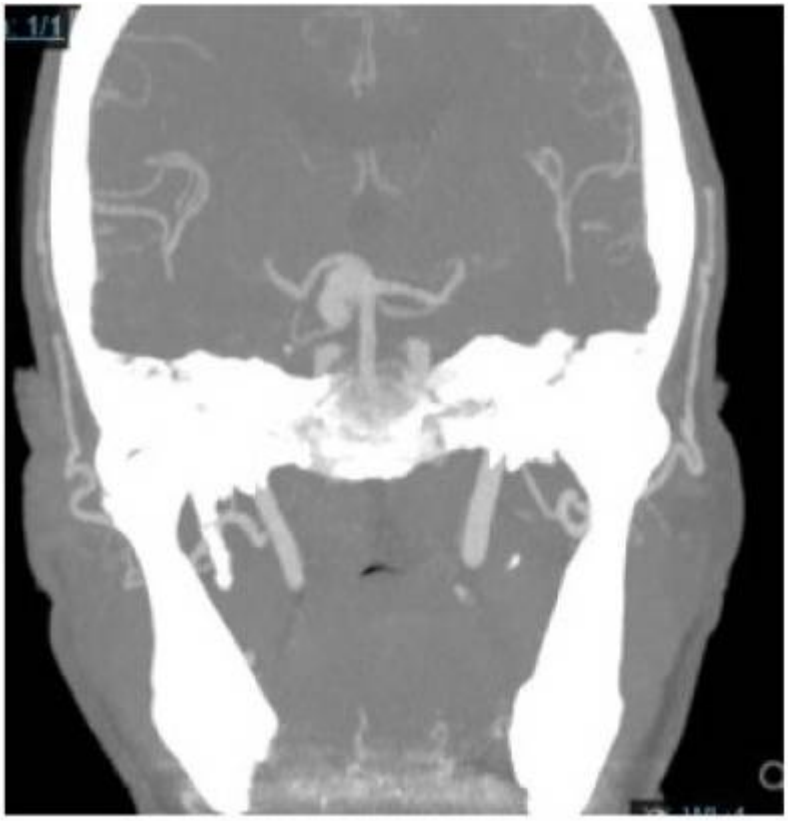
Hydrocephalus Detected: Dyna CT was performed, revealing hydrocephalus. The patient was transferred to the operating room for the placement of a ventricular drainage.

The patient is scheduled for follow-up consultations and angiographic control. No immediate complications were noted during the procedure.

Postoperative CT

A 77-year-old woman with a history of end-stage renal disease (currently undergoing hemodialysis) presented at home with a Loss of consciousness episode accompanied by weakness in the lower extremities and mild recovered dysarthria, followed by posterior occipital headache.

A cranial CT scan revealed the presence of a saccular aneurysm measuring 1.3 cm in maximum diameter, with a wide neck of approximately 4 mm, located in the right lateral wall of the basilar artery. It is situated between the ostium of the right superior cerebellar artery and the P1 segment of the posterior cerebral artery



The management of a superior cerebellar artery-P1 segment aneurysm typically involves a multidisciplinary approach, including neurosurgeons and interventional neuroradiologists. The treatment options depend on various factors such as the size and location of the aneurysm, the patient's overall health, and the risk of rupture. Possible treatment approaches may include:

Observation: If the aneurysm is small and not causing symptoms, the medical team may choose to monitor it closely with regular imaging studies to assess any changes over time.

Endovascular coiling: This minimally invasive procedure involves inserting a catheter into the blood vessels and placing tiny platinum coils within the aneurysm to promote blood clotting and prevent rupture.

Surgical clipping: This procedure involves open surgery to place a small metal clip around the neck of the aneurysm, stopping the blood flow and preventing rupture.

The choice of treatment depends on several factors, including the size and shape of the aneurysm, its location, and the patient's overall health. The medical team will evaluate these factors and determine the most suitable treatment option for each case.

see also Superior Cerebellar Artery Aneurysm

1)
Krisht AF, Krayenbühl N, Sercl D, Bikmaz K, Kadri PA. Results of microsurgical clipping of 50 high complexity basilar apex aneurysms. Neurosurgery. 2007 Feb;60(2):242-50; discussion 250-2. PubMed PMID: 17290174.
2)
Miller CA, Felbaum DR, Liu AH, Mai J, Alfawaz A, Lynes J, Armonda R. Direct Vertebral Artery Access for Coil Embolization of a Partially Thrombosed Mid-Basilar Trunk Aneurysm: Technical Limitations. Oper Neurosurg (Hagerstown). 2021 Jun 16:opab186. doi: 10.1093/ons/opab186. Epub ahead of print. PMID: 34133747.