Basilar trunk aneurysm

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- Endovascular Treatment for Ruptured Intracranial Posterior Circulation Aneurysms: Complications and Clinical Outcomes

Basilar trunk aneurysms (BTAs), are basilar artery aneurysms distal to the basilar origin and proximal to the origin of the superior cerebellar artery.

Most aneurysms of the basilar trunk are fusiform in morphology. Surgical access for these is extremely difficult.

Classification

Basilar trunk saccular aneurysm

Low Basilar trunk aneurysm

Mid-Basilar Trunk Aneurysm

Dolichoectatic basilar trunk aneurysm

Treatment

Reconstructive EVTs are a feasible and effective treatment for BTAs but are associated with a high risk of ischemic and hemorrhagic complications and a high mortality rate. Larger aneurysms may predict unfavorable clinical outcomes and aneurysm recurrence during follow-up. Hemorrhagic complications may predict unfavorable clinical outcomes, whereas immediate complete aneurysm occlusion may predict total occlusion during follow-up [1)]

Case series

52 patients. Mean age was 56 (SD±18) years. Median clinical follow-up was 33 (interquartile range, 8-86) months, and imaging follow-up was 26 (interquartile range, 2-80.5) months. BTAs were classified into 4 causal subtypes: acute dissecting aneurysms, segmental fusiform ectasia, mural bleeding ectasia, and saccular aneurysms. Multiple aneurysms were more frequently noticed among the 13 saccular aneurysms when compared with overall population (P=0.021). There was preponderance of segmental ectasia or mural bleeding ectasia (P=0.045) in patients presenting with transit ischemic attack/stroke or mass effect. Six patients with segmental and 4 with mural bleeding ectasia demonstrated increasing size of their aneurysm, with 2 having subarachnoid hemorrhage caused by aneurysm rupture. None of the fusiform aneurysms that remained stable bled.

BTAs natural histories may differ depending on subtype of aneurysm. Saccular aneurysms likely represent an underlying predisposition to aneurysm development because more than half of these cases were associated with multiple intracranial aneurysms. Intervention should be considered in segmental ectasia and chronic dissecting aneurysms, which demonstrate increase in size over time as there is an increased risk of subarachnoid hemorrhage [2)].

Case reports

Basilar trunk artery aneurysm (BTAA) has an overall low incidence in intracranial aneurysms, but its rupture is associated with high morbidity and mortality in older people. Situs inversus totalis (SIT) is a rare congenital abnormality characterized by visceral rotation and vascular abnormalities. It has been described in several uncommonly clinical cases, along with middle cerebral artery aneurysms and large carotid cavernous aneurysms. However, the association between interventional embolization for BTAA and SIT has not been reported. Long et al. described the angiography findings and interventional treatment of the association of BTAA with SIT [3)].

A 46-year-old male presented with a history of sudden severe headache 1 week back, altered sensorium and right hemiparesis for 2 days. On examination, Glasgow Coma Scale (GCS) was E4V4M6 and the patient had right hemiparesis (power - 4/5). Computed tomography (CT) revealed diffuse subarachnoid hemorrhage (Fisher's Grade III). CT angiogram revealed distal basilar trunk aneurysm arising between the origin of the left posterior cerebral artery and superior cerebellar artery, ectatic dilatation of distal basilar trunk, and a left middle cerebral artery (MCA) bifurcation aneurysm. Basilar trunk aneurysm was approached through subtemporal route and aneurysm was clipped during adenosine-induced profound hypotension (AIPH) without application of temporary clip. Single bolus 6

mg of adenosine was given, and aneurysm was successfully clipped during AIPH (systolic <60 mmHg). There were no complications related to adenosine. Ectatic part of distal basilar trunk was wrapped with Teflon. The left MCA bifurcation aneurysm was clipped in the same session. At 3-month follow-up, the patient's sensorium was normal (GCS-E4V5M6) and the right hemiparesis improved (4+/5). Adenosine enhances the safety of clipping these aneurysms by providing transient cardiac arrest or profound hypotension. In developing countries, microsurgical clipping is a cost-effective treatment option for basilar artery aneurysms [4].

A 37-year-old woman with basilar artery fenestration malformation and an aneurysm at the mid-distal junction; her symptoms included sudden headaches with nausea and vomiting.

Head digital subtraction angiography showed fenestration at the junction of the middle and upper portions of the basilar artery associated with an aneurysm, and spontaneous pseudoaneurysm formation could not be excluded.

The patient underwent stent-assisted fenestration and channel occlusion.

Five months later, no abnormalities were found by head magnetic resonance imaging. The stents were well positioned, and no occluded branches or aneurysms were present.

For mid-distal basilar artery fenestration malformation with an aneurysm, occlusion of the lesion channel is relatively safe when there are no perforating vessels in the fenestration channel and the lesion channel is a nondominant channel. Overall, more attention should be paid to the possibility of pseudoaneurysm formation in the diagnosis and treatment of this type of aneurysm [5].

A 61-year-old man presented with dysarthria and left hemiparesis attributable to a basilar trunk dissecting aneurysm. Antiplatelet therapy was instituted, and the patient's clinical condition markedly improved. However, he developed severe headache, dysarthria, and left hemiparesis 35 days later. Angiography revealed significant enlargement of the aneurysm, and stent-assisted coiling was then uneventfully performed. The patient remained clinically stable with only mild left-sided hemiparesis at the 2-year clinical follow-up [6].

References

1)
Zhong W, Zhang T, Su C, Zhou D, Zhuang J, Li M, Xu Y, Liu M, Zhang M, Wang Y, Wang D, Su W. Reconstructive endovascular treatment for basilar artery trunk aneurysms: complications and clinical and angiography outcomes. J Neurointerv Surg. 2023 Jan 13:jnis-2022-019864. doi: 10.1136/jnis-2022-019864. Epub ahead of print. PMID: 36639233.
2)
Saliou G, Sacho RH, Power S, Kostynskyy A, Willinsky RA, Tymianski M, terBrugge KG, Rawal S, Krings T. Natural history and management of basilar trunk artery aneurysms. Stroke. 2015 Apr;46(4):948-53. doi: 10.1161/STROKEAHA.114.006909. Epub 2015 Feb 24. PubMed PMID: 25712945.
3)
Long T, Xu Q, Chen X, Ma Y, He Y, Rao J. Interventional treatment of basilar trunk artery aneurysms associated with situs inversus totalis: A case report. Front Surg. 2022 Aug 30;9:971340. doi: 10.3389/fsurg.2022.971340. PMID: 36111235; PMCID: PMC9469836.

4)
Sai Kiran NA, Kiran Kumar VA, Kumar VA, Agrawal A. Microsurgical Clipping of Distal Basilar Trunk Aneurysm during Adenosine-Induced Profound Hypotension. Asian J Neurosurg. 2019 Nov 25;14(4):1214-1217. doi: 10.4103/ajns.AJNS_157_19. eCollection 2019 Oct-Dec. PubMed PMID: 31903365; PubMed Central PMCID: PMC6896639.
5)
Zhang D, Wang H, Feng Y, Xu N. Fenestration deformity of the basilar artery trunk with an aneurysm: A case report. Medicine (Baltimore). 2019 Jul;98(28):e16393. doi: 10.1097/MD.0000000000016393. PubMed PMID: 31305446; PubMed Central PMCID: PMC6641678.
6)
Fu C, Zhao C, Zhao H, Li D, Yu W. Growing dissecting aneurysm of basilar trunk treated with stent-assisted coiling. J Stroke Cerebrovasc Dis. 2015 Jan;24(1):e5-9. doi: 10.1016/j.jstrokecerebrovasdis.2014.07.033. Epub 2014 Sep 27. PubMed PMID: 25270634.