Giant basilar artery aneurysm

see Giant Fusiform Basilar Artery Aneurysm.

see Giant Basilar Apex Aneurysm

Clinical features

On the basis of clinical course, a giant aneurysm may be categorized as a chronic type which grows relatively slowly, and may lead to serious complications such as cerebral ischemia or subarachnoid hemorrhage [1)].

Treatment

Coiling of very large and giant basilar tip aneurysms is associated with reasonably low morbidity. Although additional treatment during follow-up is frequently necessary, rebleeding is uncommon [2)].

Outcome

Giant basilar artery aneurysm is a rare condition with elevated mortality within a few days of onset if untreated [3)].

Case series

Between January 1995 and October 2005, 44 very large and giant basilar tip aneurysms in 44 patients were coiled. There were 13 men (30%) and 31 women (70%) with a mean age of 51.4 years (median, 51 years; range, 34-72 years). Mean aneurysm size was 19.6 mm (range, 15-30 mm). Of 44 aneurysms, 33 (75%) had ruptured. Of 11 unruptured basilar tip aneurysms, 7 were incidentally discovered, 1 was additional to another ruptured aneurysm, and 3 were symptomatic by mass effect.

Procedural mortality was 2/44 (4.6%, 95% confidence interval (CI), 0.4%-16%) and morbidity 1/44 (2.3%, 95% CI, 0.01%-13%). Of 33 patients with ruptured aneurysms, mean clinical follow-up was 5.2 years (range, 0.5-11.5 years). Two patients had a rebleeding from the coiled basilar tip aneurysm leading to death in 1 patient and to dependency in the other patient (annual rebleeding rate, 1.1%) One other patient died 2 years later of progressive brain stem compression. Mean angiographic follow-up in 41 of 42 surviving patients was 3.1 years. Nineteen aneurysms reopened and were coiled for a second time. Of these, 9 repeatedly reopened with time and were repeatedly coiled up to 6 times. Additional treatments were without complications.

Coiling of very large and giant basilar tip aneurysms is associated with reasonably low morbidity. Although additional treatment during follow-up is frequently necessary, rebleeding is uncommon [4)].

Case reports

A 15-year-old boy in whom sensorineural hearing loss and disequilibrium developed in the setting of a giant basilar artery aneurysm. This patient was treated with a flow-diverting stent and had complete resolution of his clinical symptoms including hearing loss. This case demonstrates the efficacy of flow diversion in select pediatric patients with posterior circulation aneurysms. The features that are thought to result in successful treatment are discussed [5].

An 80 year old female patient with an unruptured giant aneurysm of the basilar artery presenting with posterior circulation ischemic symptoms. Angiography and CT revealed a giant basilar aneurysmal dilatation with severe and wide intracranial arteriosclerosis. They described the uniqueness of this case. Giant basilar aneurysm is associated with various complications particularly brainstem infarction. It is emphasized that arteriosclerosis plays an important role in the formation of giant basilar aneurysms [6].

A case of an 80-year-old man with a surgically untreated fusiform aneurysm that evolved into a giant aneurysm of the basilar artery within 4 years. The patient presented recurrent ischemic events involving the posterior circulation without aneurysmal rupture or bleeding [7].

A 46-year-old right-handed woman presented with a 3-month history of occipital headache, progressive confusion, and personality change. Neurologic examination revealed mildly impaired smooth-pursuit eye movements, mildly impaired walking with a tandem gait, and a score of 30 out of 38 on the Kokmen Short Test of Mental Status (with a score of less than or equal to 29 indicating dementia). Computed tomography of the head revealed a circumferential midbrain lesion with mass effect and hydrocephalus. Magnetic resonance imaging (MRI) and magnetic resonance angiography revealed an aneurysm (3.5 cm by 4 cm) at the bifurcation of the basilar artery, with compression of the midbrain and probably the mamillary body; these findings were confirmed by cerebral angiography. Because the aneurysm incorporated the origin of both posterior cerebral arteries, it was not amenable to safe direct surgical clipping or to endovascular embolization. A surgical clip was used to occlude the basilar artery below the origin of the superior cerebellar arteries to reverse the flow and promote aneurysm thrombosis; this permitted adequate collateralization to the top of the basilar territory through the posterior communicating artery. The patient was discharged home 3 days after the procedure, with no neurologic deficits. Follow-up MRI 1 month later revealed persistent filling of the aneurysm through collateral vessels. She died suddenly 6 weeks after treatment, possibly owing to progressive hydrocephalus or delayed aneurysm rupture. No autopsy was performed [8].

Nwagwu et al., presented the endovascular management of an adolescent who presented comatose with pinpoint pupils due to a ruptured giant basilar trunk aneurysm. A noncontrast head CT disclosed a large prepontine lesion with brainstem hemorrhage. Catheter angiography showed a 4.5 cm irregular, fusiform basilar trunk aneurysm. With SSEP, BAER, and MEP monitoring, the patient underwent bilateral temporary vertebral artery occlusion, followed by GDC embolization of the

aneurysm. Postprocedure internal carotid angiograms showed adequate blood supply to the basilar apex via patent posterior communicating arteries. On postprocedure day two, the patient was following commands. The remainder of his hospital course was uneventful. Postoperative angiograms showed no residual filling of the aneurysm. At 12 months the patient was neurologically intact and at baseline function as an honor student and follow-up angiogram showed persistent occlusion of the aneurysm from the circulation. Successful endovascular treatment has been considered a less invasive and safer alternative to surgical management of some complex vascular lesions. While most reports on reversing basilar artery flow have been carried out in awake patients with neurological examinations, this is not possible in a patient presenting in a comatose state. This report suggests that SSEPs, BAERs and MEP may be of use in such patients in safely carrying out basilar artery occlusion [9].

A 67-year-old woman was admitted with symptoms of gait disturbance and dementia. Computed tomographic scans revealed a large mass located in the prepontine region and extending into the third ventricle as well as moderate dilatation of the lateral ventricles. Angiography demonstrated a giant basilar tip aneurysm and multiple aneurysms located in the bilateral anterior and middle cerebral arteries.

Ventriculoperitoneal shunting was scheduled, but subarachnoid and intraventricular hemorrhage occurred and the patient died. Computed tomographic scans, performed immediately before the disastrous hemorrhage, displayed intramural hemorrhage in the wall of the giant basilar tip aneurysm. Ventricular drainage was performed, but the patient died.

It seems probable that intramural hemorrhage of the aneurysmal wall may cause both the growth and rupture of intracranial giant aneurysms [10].

References

[1], [3], [7]
Cappellari M, Tomelleri G, Piovan E, Bovi P, Moretto G, Gulli G. Chronic fusiform aneurysm evolving into giant aneurysm in the basilar artery. Neurol Sci. 2012 Feb;33(1):111-5. doi: 10.1007/s10072-011-0628-y. Epub 2011 May 24. PubMed PMID: 21607753.

[2], [4]
van Rooij WJ, Sluzewski M. Coiling of very large and giant basilar tip aneurysms: midterm clinical and angiographic results. AJNR Am J Neuroradiol. 2007 Aug;28(7):1405-8. PubMed PMID: 17698553.

[5]
Mohammad LM, Coon AL, Carlson AP. Resolution of giant basilar artery aneurysm compression and reversal of sensorineural hearing loss with use of a flow diverter: case report. J Neurosurg Pediatr. 2017 Jul;20(1):81-85. doi: 10.3171/2016.9.PEDS16428. Epub 2017 Apr 28. PubMed PMID: 28452658.

[6]
Yu YP, Zhao HQ, Ren WF, Chi XL. Giant aneurysm of the basilar artery in an 86 year old woman. F1000Res. 2013 Apr 18;2:112. doi: 10.12688/f1000research.2-112.v1. eCollection 2013. PubMed PMID: 24358886; PubMed Central PMCID: PMC3814923.

[8]
Killu AM, Lanzino G. Images in clinical medicine: Giant basilar-artery aneurysm. N Engl J Med. 2012 Nov 8;367(19):e28. doi: 10.1056/NEJMicm1207982. PubMed PMID: 23134405.

[9]
Nwagwu CI, Mathews MS, Scott JA, Denardo AJ, Horner TG. Ruptured Giant Basilar Artery Aneurysm in a Comatose Adolescent: Successful Obliteration Using Intraoperative SSEP, BAER, and MEP

Monitoring. A Case Report. Interv Neuroradiol. 2006 Sep 15;12(3):237-44. Epub 2006 Dec 13. PubMed PMID: 20569577; PubMed Central PMCID: PMC3354541.

10) Koyama S, Kotani A, Sasaki J. Giant basilar artery aneurysm with intramural hemorrhage and then disastrous hemorrhage: case report. Neurosurgery. 1996 Jul;39(1):174-7; discussion 177-8. PubMed PMID: 8805156.