Transdural anastomotic aneurysm

Moyamoya disease (MMD) is an idiopathic progressive steno-occlusive disease in the internal carotid artery bifurcation. In rare circumstances, transdural anastomotic aneurysm (TAA) could develop during the progression of MMD.

Actually, 4%~15% of patients with moyamoya disease harbored aneurysms at the peripheral and proximal arteries in previous reports [1) 2) 3) 4)].

Case reports

Hou et al. presented an illustrative case study of TAA in association with MMD. To further explore this rare entity, a comprehensive literature review was also conducted.

The illustrative patient experienced spontaneous remission of the aneurysm during follow-up. By literature review, 12 patients with 13 TAAs, including this case, were identified. The patients aged from 10 to 74 years (46.3 ± 17.4). Eleven (92%) of the patients presented with intracranial hemorrhage, and 1 TAA (8%) was incidentally found. The responsible transdural collaterals were from the middle meningeal artery, occipital artery, internal maxillary artery, and ophthalmic artery in 8 (66.7%), 2 (16.7%), 1 (8%), and 2 (17%) patients, respectively. The anastomosed cerebral arteries were middle cerebral artery, anterior cerebral artery, posterior cerebral artery, and ICA in 5 (42%), 3 (25%), 3 (25%), and 1 (8%) patient, respectively. Eight (67%) patients underwent open surgeries. Two (17%) patients underwent transarterial embolization (TAE) only. Two (17%) patients experienced spontaneous remission of the aneurysm. Seven (58%) patients died or had neurologic deficits. TAAs rarely occur in the progression of MMD, which often presents with intracranial bleeding. Invasive management through open surgery or endovascular treatment is warranted to prevent catastrophic rebleeding. As some individuals might experience spontaneous aneurysm remission, conservative treatment and close imaging follow-up could be considered as an alternative when invasive treatment is risky [5)]

Fukuda et al. reported a case of successful embolization of a ruptured aneurysm through a transdural anastomotic artery. The aneurysm formed at the developed collateral vessel from the meningeal branch of the occipital artery (OA) to the posterior pericallosal artery. A 59-year-old man presented with acute-onset headache, and computed tomography revealed subarachnoid hemorrhage and intracerebral hemorrhage at the splenium of the corpus callosum with intraventricular hemorrhage. Digital subtraction angiography demonstrated a ruptured aneurysm located at a transdural anastomotic artery from the right OA to the posterior pericallosal artery. The patient underwent endovascular treatment for the aneurysm through the transdural anastomotic artery with a coil and n-butyl-2-cyanoacrylate. Because it was impossible to navigate a microcatheter to the aneurysm through the right anterior cerebral artery because of the occlusion of its proximal portion, it was advanced through the transdural anastomosis from the right OA. The aneurysm was completely occluded without complications. Endovascular embolization is a useful treatment option for a peripheral cerebral aneurysm developed at a collateral vessel with intracranial major artery occlusion [6)].

1)

Borota L, Marinkovic S, Bajic R, et al. Intracranial aneurysm associated with moyamoya disease. Neurol Med Chir (Tokyo) 1996; 36: 860–864.
2)

Kodama N, Sato M, Sasaki T. Treatment of ruptured cerebral aneurysm in moyamoya disease. Surg Neurol 1996; 46: 62–66.
3)

Kwak R, Ito S, Yamamoto N, et al. Significance of intracranial aneurysms associated with moyamoya disease. (Part I). Differences between intracranial aneurysms associated with moyamoya disease and usual saccular aneurysms—review of the literature [article in Japanese]. Neurol Med Chir (Tokyo) 1984; 24: 97–103.
4)

Yabumoto M, Funahashi K, Fujii T, et al. Moyamoya disease associated with intracranial aneurysms. Surg Neurol 1983; 20: 20–24.
5)

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6)

Fukuda N, Kanemaru K, Hashimoto K, Yoshioka H, Senbokuya N, Yagi T, Kinouchi H. Embolization of a peripheral cerebral aneurysm associated with intracranial major artery occlusion through a transdural anastomotic artery: Case report. Interv Neuroradiol. 2019 Apr;25(2):172-176. doi: 10.1177/1591019918801539. Epub 2018 Sep 19. PMID: 30231796; PMCID: PMC6448377.