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NEURORADIOLOGY

LETTER TO THE EDITOR

Unusual collaterals through interhemispheric connections in Moyamoya disease

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Dear Editor,

This paper aims to inform readers about some rare collateral structures of Moyamoya disease (MMD). Collateral circulation is crucial in preserving cerebral blood flow in patients with occlusion or reduced antegrade cerebral artery flow. In acute anterior or posterior circulation occlusions, the circle of Willis (including the anterior and posterior communicating arteries and, second, the extracranial-intracranial collaterals, mostly via the ipsilateral external carotid artery and ophthalmic artery) contributes to the maintenance of perfusion. In addition to these well-established anastomotic pathways, it is well known that pre-existing intraparenchymal and duro-pial anastomotic vascular structures are induced and become visible in chronic and gradual occlusion cases. These chronic collaterals are most typically seen in MMD. MMD describes a chronic progressive stenosis or occlusion of the supraclinoid internal carotid artery (ICA) and/or the proximal portions of the anterior (ACA) and middle cerebral arteries.[1] Collateral vessels at the base of the brain, called Moyamoya vessels, are mainly lenticulostriate, thalamoperforating, and choroidal arteries that are also intrastriatal, intrathalamic, transmedullary and transcallosal anastomotic structures, which have been described in many studies.[2,3] Regarding submillimeter basal collateral vasculature, imaging with 7T time-of-flight magnetic resonance angiography was comparable to catheter angiography.[4] Although these collateral structures have also been clearly demonstrated in some microsurgical studies, transhemispheric vascular anastomosis via the anterior commissure, interthalamic adhesion, or other interhemispheric connections has not yet been demonstrated radiologically according to this study's literature research.[5,6] These anastomoses may contribute greatly to the preservation of contralateral hemispheric perfusion and may become radiologically visible. When ICA supraclinoid occlusion is accompanied by ipsilateral ACA A1 segment and posterior communicating artery occlusions, as in our illustrative images of a patient with MMD, these afore-

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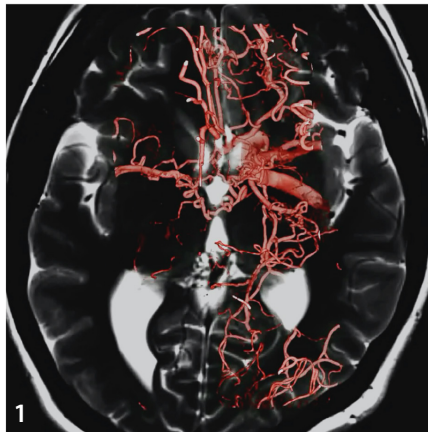

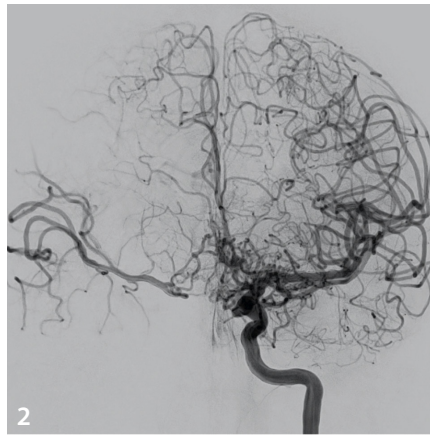

Figures 1, 2. Three-dimensional rotational angiography–magnetic resonance imaging fusion and left internal carotid angiogram images of a patient with Moyamoya disease showing right internal carotid artery (ICA) supraclinoid occlusion, right middle cerebral arteries reconstruction via anterior commissural, and interthalamic collaterals through the left ICA.

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mentioned anastomotic vascular collaterals via interhemispheric white matter gain great importance. Recognition of the role of these collateral structures in the perfusion of the contralateral hemisphere is also important in treating aneurysms due to hemodynamic stress in these collaterals and may bring bypass surgery to the forefront rather than endovascular treatment (Figures 1, 2).

Conflict of interest disclosure

The authors declared no conflicts of interest.

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