

Case Reports & Case Series

Proximal stump of an occluded middle cerebral artery mimicking a ruptured saccular aneurysm

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A B S T R A C T

It is difficult to distinguish a stump of occluded intracranial arteries from saccular aneurysms on computed tomography (CT) and angiography images. To our knowledge, a middle cerebral artery (MCA) vascular stump which mimicking an aneurysm is extremely rare. Although several cases of MCA vascular stump have been reported, they are usually asymptomatic or involve cases of ischemic stroke. Herein, we report a unique case of an occluded middle cerebral artery stump, which was considered as the source of a subarachnoid hemorrhage on preoperative CT angiogram images.

A 63-year-old female was transferred to our department because of generalized seizures. She has been regularly undergoing dialysis because of diabetic nephropathy and was on dual antiplatelet therapy after a percutaneous coronary intervention. On admission, she was drowsy but had no focal neurological deficits. Brain computed tomography (CT) showed a subarachnoid hemorrhage (SAH) in the right sylvian fissure (Fig. 1; left). Three-dimensional computed tomography angiography (3D-CTA) revealed an aneurysmal distention at the bifurcation of the right middle cerebral artery (MCA) associated with proximal stenosis (Fig. 1; right). The MoyaMoya phenomenon was not described on the 3D-CTA. She underwent urgent craniotomy for repair of a presumably ruptured aneurysm. However, intraoperatively, we discovered that the lesion was a stump of the occluded branch of the MCA (Fig. 2). Furthermore, there was no evidence of dissection of the proximal portion of the MCA. Postoperatively, she recovered without neurological deterioration. Repeat CT angiography revealed no apparent source of bleeding. The relationship between antiplatelets and non-aneurysmal SAH has been reported [1]. In this case, the dual antiplatelet therapy might have contributed to the SAH.

A stump of the occluded MCA that mimics an aneurysm has been reported previously [2–5]. These cases were identified by ischemic symptoms, such as aphasia or hemiparesis [2,4,5], or discovered incidentally in asymptomatic cases [3]. A few reports showed there is MoyaMoya phenomenon in distal trunk of the proximal stump of occluded MCA, and that may provide a clue to the diagnosis [4]. Past several reports described that stump of the MCA should be considered if

the aneurysm on the image has a tapered, conical shape [3,6]. Dissection of MCA may also cause SAH and infarction. In previous reports, it commonly can show segmental stenosis of the involved vessel segment [7]. For this reason, in the preoperative examination, MCA dissection could be the cause of SAH in this case. However, MCA dissection was denied from intraoperative findings. Those findings are often observed in Digital subtraction angiography (DSA). In Japan, it has become common to perform SAH surgery based on CTA evaluation instead of DSA [8], and DSA was also skipped in this case. If we performed DSA, it might have led to the diagnosis of stump of the MCA. Furthermore, Khattar et al. reported the usefulness of MRI sampling perfection with application optimized contrasts using different flip angle evolution (SPACE) sequences to identify vessels when they are not patent [6].

However, accurate neuroradiological diagnosis requires further elucidation because of its unusual occurrence. Our case is unique given its association with SAH, and with the matched localization. This case serves as a reminder of this fairly rare condition that can be associated with SAH. This finding is important for neurosurgeons who perform surgery of SAH.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Abbreviations: CT, Computed tomography; 3D-CTA, Three-dimensional computed tomography angiography; MCA, Middle cerebral artery; SAH, Subarachnoid hemorrhage

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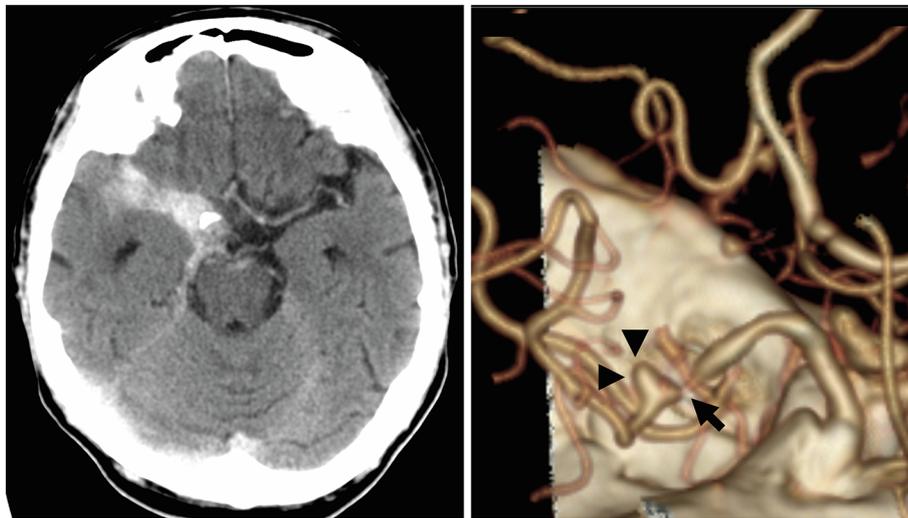


Fig. 1. Computed tomography (CT) image (left) shows a subarachnoid hemorrhage in the right sylvian fissure. Three-dimensional CT angiography (right) shows aneurysmal distention at the bifurcation of the right middle cerebral artery (arrow heads) associated with proximal stenosis (arrow).

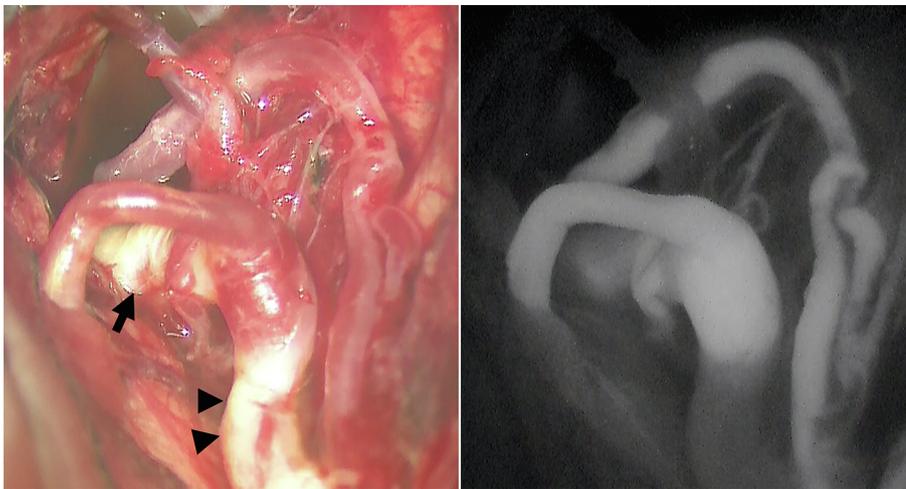


Fig. 2. Intraoperative photograph (left) and indocyanine green videoangiogram (right) shows the occluded branch of the middle cerebral artery (MCA; arrow heads) and arteriosclerosis of the proximal MCA (arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

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