## Case Report

# Effective Mechanical Thrombectomy in a Patient with Hyperacute Ischemic Stroke Associated with Cardiac Myxoma

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> Ischemic stroke is the most common neurologic manifestation of cardiac myxoma. However, there has been no current guideline on the treatment of hyperacute ischemic stroke due to cardiac myxoma. We describe a patient with hyperacute stroke caused by cardiac myxoma who had a good outcome with rapid recanalization through mechanical thrombectomy. A 46-year-old man was admitted with acute symptoms of right side hemiplegia and global aphasia. Brain computed tomography (CT) angiography showed a T occlusion of the left internal carotid artery. Intravenous recombinant tissue plasminogen activator was administered. However, his clinical symptoms did not improve. Thus, we performed endovascular treatment and had a successful outcome. A pathologic examination of the retrieved clot revealed a tumor emboli from a cardiac myxoma. Transthoracic echocardiogram revealed a left atrial myxoma in which a large mass was attached to the posterior wall of the aorta. The patient's neurologic deficits recovered with the exception of left eye blindness. Reperfusion therapy with mechanical thrombectomy might be safe and effective for the rapid revascularization of large vessel occlusions in hyperacute ischemic stroke, from which the tumor thrombi can be retrieved. Key Words: myxoma—emboli—mechanical Ischemic stroke—cardiac thrombectomyrecanalization-clinical outcome. © 2014 by National Stroke Association

Cardiac myxoma is the most common primary tumor of the heart. Ischemic stroke and transient ischemic attack are the most common neurologic manifestations (93 of 113, 82%) of cardiac myxoma.<sup>1,2</sup> Recognizing myxoma is important because it can be a potential and curable cause of ischemic stroke in the young. We report a patient with hyperacute ischemic stroke caused by cardiac myxoma who had a favorable outcome with rapid recanalization through mechanical thrombectomy.

### **Case Report**

A 46-year-old man was brought to the emergency room with sudden onset of the inability to speak and right side weakness. He was not co-operative due to global aphasia. He had a right central type facial palsy and right hemiparesis. Brain CT showed no evidence of intracranial hemorrhage. Intravenous recombinant tissue plasminogen activator (tPA) was administered. Angiography demonstrated the T occlusion of the left distal internal carotid

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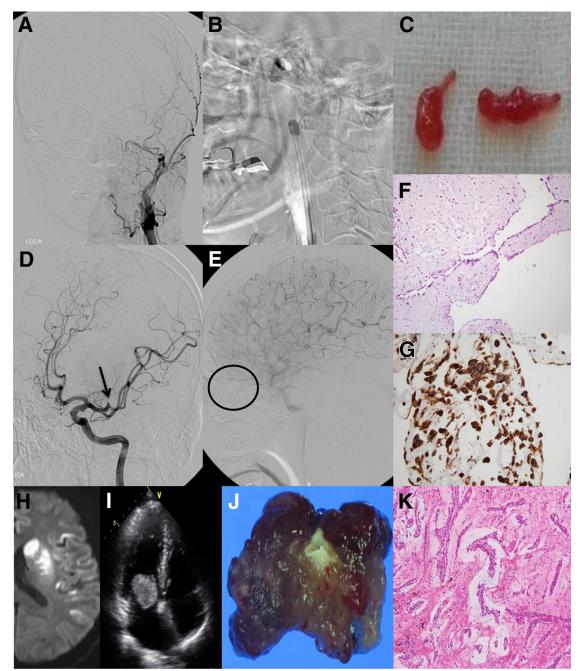
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**Figure 1.** (*A*) Left common carotid artery angiography confirmed that the left distal internal carotid artery (ICA), proximal middle cerebral artery (MCA) M1, and the anterior cerebral artery A1 portion were occluded. In addition, the flow velocity was decreased from the left proximal ICA. (B) Balloon-tipped guided catheter in left ICA. (C) The gross appearance of the clot; a yellowish gelatinous tissue. (D) After the first attempt, angiography showed fully recanalization of the left distal ICA and main trunk of MCA. However, reocclusion of the left proximal M2 superior division was revealed (arrow). (E) The left ICA angiogram did not show left choroidal crescent (inner circle). (F) Hematoxylin and eosin stain (H&E), ×100. Round and polygonal cells are seen surrounded by abundant loose stroma rich in acid mucopolysaccharides, concentrating beneath the surface. Mitoses, pleomorphism, and necrosis are absent. (G) ×200. CD34 expression is positive in myxoma cells. (H) The postprocedure diffusion-weighted magnetic resonance imaging showed acute left striatocapsular and cortical infarction in the left MCA territory. (I) Transthoracic echocardiogram showed 1 myxoma in the left atrium. (J) Gross examination showed 4.2 × 3 × 2-cm-sized brown-gray whit-ish myxoid mass. (K) H&E stain, ×100. Cardiac myxoma cells are forming partly interconnected cords that are separated by a myxoid matrix.

artery (ICA; Fig 1, A). Forced suction thrombectomy with a balloon-tipped guiding catheter (Optimo; Tokai Medical Products, Kasugai, Japan) was attempted (Fig 1, B), and a large amount of a gray, whitish-to-reddish clot was removed (Fig 1, C). The left distal ICA and the main trunk of the middle cerebral artery were fully recanalized, although the left proximal M2 superior division was still occluded (Fig 1, D). Microsuction thrombectomy was performed with a 032 Penumbra system reperfusion catheter (Penumbra Inc, Alameda, CA), achieving

revasculization of the left proximal M2. After treatment, the choroidal crescent was not seen (Fig 1, E). On the following day, the global aphasia was improved although the patient complained of left eye blindness. We believed that the occlusion of the cilioretinal artery contributed to visual loss. A pathologic examination of the retrieved clot revealed a tumor emboli from a cardiac myxoma (Fig 1, F,G). A diffusion-weighted magnetic resonance image 24 hours later revealed a left middle cerebral artery territory infarction (Fig 1, H). There was no possible source of usual thromboembolism. Transthoracic echocardiogram revealed a 3.4  $\times$  2.7-cm-sized mass in the left atrium (Fig 1, I). The patient underwent resection of the myxoma 5 days after the stroke. Gross examination showed a  $4.2 \times 3 \times 2$ -cm-sized brown, gray, and whitish myxoid mass (Fig 1, J). Pathology confirmed the atrial myxoma (Fig 1, K). Three months after therapy, he still had a loss of vision in his left eye.

#### Discussion

As far as we know, our case is the second report of the successful mechanical thrombectomy of hyperacute ischemic stroke due to cardiac myxoma. In this patient, intravenous tPA therapy was not effective. However, with a simple method using a 9-F balloon-tipped guiding catheter, we could recanalize the terminal ICA. Although stent retriever is effective in recanalization of M1 and M2 branch in some of the cases, we chose to use aspiration thrombectomy with Penumbra. Because we did not necessarily have to cross the clot to remove it, that tremendously decreased the risk of trapped thrombus migration. In addition, aspiration thrombectomy was effective in the recanalization of terminal ICA, and we thought that the clot nature would be probably the same. Emboli caused by cardiac myxoma may be

composed of fragments of the myxoma itself, a thrombus, or both.<sup>3</sup> A previous report suggested that the efficacy of treatment was related to thrombus composition.<sup>4</sup> A pathologic examination of our case demonstrated round and polygonal cells surrounded by abundant loose stroma rich in acid mucopolysaccharides. Accordingly, we believed that effective thrombectomy would be possible.

Embolism due to myxoma may occur in any part of the body. Some patients had the visual loss because of involvement of the retinal arteries.<sup>5,6</sup> We did not notice his visual symptoms initially because he had global aphasia. However, we could have expected his visual symptoms because a choroidal crescent was not seen during angiography. Therefore, the ophthalmic artery and choroidal crescent should be checked when performing angiography in patients with cardiac myxoma.

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