Thrombectomy of the middle cerebral artery

Case report

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A case is described in which thrombectomy of the middle cerebral artery by way of one of its side branches successfully restored blood flow in the artery and resulted in marked regression of neurological disturbances.

Key Words · thrombectomy · middle cerebral artery, occlusion

Thrombectomy of the middle cerebral artery for arterial occlusion has already been documented.1-10 We report a case in which thrombectomy of the middle cerebral artery was performed by way of a small branch of this artery.

Case Report

This 43-year-old right-handed man had been in good health until July 5, 1971, when he suddenly became unable to speak for some minutes. Two days later he again became speechless, and right hemiparesis developed. He was admitted to the neurosurgery division on July 13.

Examination. The patient's general condition was satisfactory. He had a global aphasia; the pupils were equal and reacted to light. A severe right hemiparesis was evident including right central facial palsy, but sensory examination was impossible because of the patient's inability to communicate. There was a slight increase in the activity of the right brachioradial and ankle reflexes. There was a positive right Babinski sign. The electroencephalogram showed distinct pathological changes in the left temporoparietal region. The patient's blood pressure was 110/80, pulse 70. Both carotid arteries had good pulsations and no bruits were audible.

One week of bed rest and anticoagulant therapy did not bring any improvement. Carotid angiography performed on July 21 under local anesthesia revealed a complete occlusion of one of the branches of the middle cerebral artery (MCA) (Fig. 1 upper left and right).

Operation. On July 29 left frontotemporal craniotomy under general anesthesia was performed. The brain did not appear discolored and the blood in the small cortical arteries appeared to be well oxygenated.

The Sylvian fissure was divided and the MCA was exposed from its origin at the carotid bifurcation to the branches of trifurcation. The MCA was thrombosed about 10 mm distal to its bifurcation and at the level of one of its branches (Fig. 2 A). Direct blood flow coursed proximal to and retrograde flow distal from the occlusion. A small branch a few millimeters above the thrombosis was
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**Fig. 1.** *Upper Left and Right:* Preoperative left carotid angiograms. Lateral and anteroposterior (AP) views showing occlusion of one of the branches of the middle cerebral artery (MCA). *Lower Left:* Postoperative angiogram, AP view, showing the blood supply to the previously occluded MCA complex. *Lower Right:* Angiogram 5 months after operation. AP view showing a good vascularization of the MCA and its branches.

**Fig. 2.** Diagrams showing the steps of thrombectomy. The MCA proximal and distal to the thrombus is fed with arterial blood (dotted area). The secondary clot around the thrombus is demonstrated by hatched area. c = internal carotid artery; a1 = anterior cerebral artery; m1 = middle cerebral artery; m2, m3 = branches of middle cerebral artery; T.B. = branch for thrombectomy.
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also obstructed with a blood clot. This small branch was used for thrombectomy (Fig. 2 B). The branch was incised and several bits of clot removed with a very small suction tip, causing a good backflow of blood (Fig. 2 C). A temporary clip was applied to the MCA distal to the thrombectomy branch (TB) (Fig. 2 D), and some of the thrombus was teased out of the artery with a sucker. Then with a long blunt forceps applied to the wall of the vessel the thrombus was slowly and gently eased into the thrombectomy branch and removed.

Good direct bleeding from the thrombectomy branch was obtained (Fig. 2 D). A temporary clip was applied proximal to the thrombectomy branch, and the previous temporary clip was removed to encourage retrograde bleeding (Fig. 2 E). The proximal clip was removed and the thrombectomy branch was clipped (Fig. 2 F and G). A good pulsation of the whole vessel was noted, and the craniotomy was closed. An angiogram done just after the operation revealed adequate feeding of the previously occluded MCA complex (Fig. 1 lower left).

Postoperative Course. The patient recovered from anesthesia without difficulty. Three days postoperatively improvement of movement in the right arm was noted and gradually increased. The 17th postoperative day he was walking without aid. At discharge 4 weeks after surgery, the patient was able to say a few monosyllabic words; he had a slight paresis of the right arm.

Five months postoperatively power in his right arm and leg was normal, and he could enunciate multisyllabic words and three- to four-word phrases clearly. His speech reception was almost normal and he could care for himself completely. Angiograms obtained at this time showed a good vascularization of the MCA and its branches (Fig. 1 lower right).

Discussion

Thrombectomy of the MCA is usually performed by arteriotomy with subsequent closure of the vessel. Instead of completely closing the artery, it is possible to narrow it using the technique described. We were successful in performing thrombectomy by way of one of the small branches of the MCA situated near the occlusion, and achieved restoration of blood flow and marked regression of neurological disturbances. With this method arteriotomy and closing of the vessel were unnecessary.

References


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