Complex middle cerebral artery aneurysm case series

All internal maxillary artery (IMA) bypasses performed between January 2010 and July 2018 in a single-center, single-surgeon practice were screened.

In total, 12 patients (9 males, 3 females) with Complex middle cerebral artery aneurysms (CMCAAs) managed by high-flow IMA bypass were identified.

The mean size of CMCAAs was 23.7 mm (range 10–37 mm), and the patients had a mean age of 31.7 years (range 14–56 years). The aneurysms were proximally occluded in 8 cases, completely trapped in 3 cases, and completely resected in 1 case. The radial artery was used as the graft vessel in all cases. At discharge, the graft patency rate was 83.3% (n = 10), and all aneurysms were completely eliminated (83.3%, n = 10) or greatly diminished (16.7%, n = 2) from the circulation. Postoperative ischemia was detected in 2 patients as a result of graft occlusion, and 1 patient presenting with subarachnoid hemorrhage achieved improved modified Rankin Scale scores compared to the preoperative status but retained some neurological deficits. Therefore, neurological assessment at discharge showed that 9 of the 12 patients experienced unremarkable outcomes. The mean interval time from bypass to angiographic and clinical follow-up was 28.7 months (range 2–74 months) and 53.1 months (range 19–82 months), respectively. Although 2 grafts remained occluded, all aneurysms were isolated from the circulation, and no patient had an unfavorable outcome.

The satisfactory result in the present study demonstrated that IMA bypass is a promising method for the treatment of CMCAAs and should be maintained in the neurosurgical armamentarium. However, cases with intraoperative radical resection or inappropriate bypass recipient selection such as aneurysmal wall should be meticulously chosen with respect to the subtype of MCA aneurysm [1)].

Twenty patients with complex MCA aneurysms treated by microsurgery in Chinese People's Liberation Army General Hospital between December 2009 and November 2012 were retrospectively analyzed. There were 12 male and 8 female patients, with a mean age of 43 years (range: 14-58 years). Giant middle cerebral artery aneurysm were found in 6 cases, Wide necked aneurysm in 7 cases and serpentine ones in 3 patients. Important perforators were involved in aneurysm neck in 2 cases. Important branches originated from aneurysms in 6 patients. Two patients harbored recurrent aneurysms after coiling. Individualized surgical strategies were planned according to preoperative imaging. A frontotemporal approach was routinely used. Intraoperative somatosensory evoked potential monitoring, indocyanine green videoangiography and Intraoperative microvascular Doppler sonography were regularly used. A postoperative digital subtraction angiography (DSA) or computed tomography angiography (CTA) was performed to verify the efficacy of treatment and patency of bypass vessels.

Of the 20 cases, 7 aneurysms were clipped with clipping and reconstruction of parent artery with multiple clips, 3 M1 segment aneurysms were proximally occluded with extra-intracranial high-flow revascularization, 2 aneurysms were treated with aneurysmectomy with superficial temporal artery to middle cerebral artery low-flow revascularization, 1 aneurysm was treated with aneurysmectomy with superficial temporal artery to middle cerebral artery low-flow revascularization and branch side-to-side anastomosis, 2 aneurysms were treated with aneurysmectomy and re-anastomosis of parent artery, 1 aneurysm was treated with aneurysmectomy and re-anastomosis of parent artery and

reinplantation of lenticulostriate artery, 3 bilateral MCA aneurysms were clipped by unilateral approach, and 1 was trapped. Nineteen patients were favorable with Glasgow Outcome Scale score 4-5 at discharge, and 1 patient died of cardiac infarction one week after surgery. The mean clinical follow-up was 20 months (range: 6-39 months). During follow-up, no bleeding occurred. DSA or CTA confirmed absence of aneurysm in 14 cases and residual neck in 2 patients. The other 3 patients were lost to follow-up.

Individualized, multi-modality surgical treatment strategies are effective and safe solution for treatment of complex MCA aneurysms. Revascularization remains imperative surgical technique [2].

1)
https://thejns.org/focus/view/journals/neurosurg-focus/46/2/article-pE10.xml
2)
Sun Z, Wu C, Wang F, Xue Z, Xu B, Zhou D. [Individualized surgical treatment of complex middle cerebral artery aneurysms]. Zhonghua Wai Ke Za Zhi. 2014 Aug;52(8):576-9. Chinese. PubMed PMID: 25370755.