Middle cerebral artery aneurysm case reports

A 39-year-old man with a residual class III Raymond-Roy occlusion partially coiled aneurysm at the left middle cerebral artery bifurcation (Video 1). Faced with the risks of re-rupture, the patient underwent microsurgical treatment after providing consent. Despite successful initial microsurgical clipping, postoperative complications arose due to coil protrusion into the middle cerebral artery bifurcation, resulting in thrombotic occlusion of the frontal M2 branch. Emergency repeat microsurgical intervention and administration of a thrombolytic agent were performed to address complications, ultimately preserving blood flow. Subsequent endovascular placement of a flow-diverting stent 7 weeks after discharge confirmed complete occlusion of the aneurysm. The patient had no neurological deficit on follow-up. When planning microsurgical clipping of an aneurysm previously treated with coils, it is critical to consider coil placement, as there is a risk of prolapse if the coil is in the neck of the aneurysm. Thrombosis of the cerebral arteries is a potential complication of microsurgical clipping of partially coiled intracranial aneurysms, and injection of a fibrinolytic agent into thrombosed arterial branches may be an effective intraoperative method for treating intra-arterial thrombosis.3 This case illustrates the challenges associated with treating partially coiled aneurysms, highlighting the significance of careful planning when considering microsurgical treatment [1)]

A 72-year-old man with an incidentally discovered 5-mm middle cerebral artery aneurysm. Despite a low rupture risk,5 the patient himself opted for treatment, and because of the complex shape of the aneurysm, he chose surgical clipping as the treatment of choice. Two unique aspects of the patient's anatomy brought forth the transorbital approach for consideration. He had a wide fissure, which opened to the orbital wall, and a giant frontal sinus made its avoidance difficult with any anterolateral transcranial approach. The lateral transorbital approach was started with a transpalpebral incision.4,6,7 Both wings of the sphenoid bone were drilled until the frontal and temporal dura were exposed. Opening this through the orbit gained direct access to the large Sylvian fissure. Two specific challenges were specific to this opening: the aneurysm dome pointed straight at the surgeon, and the M1 segment, needed for proximal control, was directly behind the aneurysm. Despite these, the aneurysm was successfully eliminated through the transorbital approach with no residual or normal branch compromise. Given the specific anatomical provisions, the lateral transorbital approach was an effective and safe alternative to the pterional approach for middle cerebral artery aneurysms. No Institutional Review Board approval was sought or necessary as the patient provided consent for the procedure, publication of his image, and this submission [2)].

Flow diverter (FD) is increasingly used for wide-neck intracranial aneurysm treatment. Despite a reported lower efficacy in middle cerebral artery (MCA) aneurysms, they are still being utilized. Microsurgery is best considered as an index treatment, but can also be a safe and effective treatment when encountering a persistent MCA aneurysm after prior FD. As there is a paucity of literature and more cases of failed FD are expected to appear, we want to add our experience to the existing literature. The microsurgical management of a persistent middle cerebral artery bifurcation aneurysm, 3 years after a p48 MW HPC Flow Diverter (phenox GmbH, Bochum Germany) insertion is reported, and the relevant literature discussed [3)]

2023

A 68-year-old male patient with known hypertension, coronary artery disease, and Benign Prostatic Hyperplasia was admitted after a ruptured aneurysm of 4.5 mm in the right middle cerebral artery M1 segment and subarachnoid hemorrhage were detected in the emergency room imaging after syncope at home. WEB device was placed into the aneurysm in the patient who was planned for endovascular treatment. After 3 days of the procedure, neurologic examination showed regression. In the brain computed tomography imaging, it was observed that there was an intraparenchymal hematoma of 4,5 cm in the right temporoparietal region, and the aneurysm, which had been treated with endovascular WEB, was ruptured. The aneurysm was clipped in the patient for whom emergency surgical treatment was planned.

As a conclusion, re-bleeding can be seen after aneurysm treatment with the Web device. If it is planned to re-close the aneurysm treated with the web device with a surgical clip, the pressure created by the device against the vessel can be reduced with the additional clip [4].

A patient who presented with a focal seizure from a symptomatic CCM with acute hemorrhage was incidentally found to have a cerebral aneurysm and bilateral internal carotid artery (ICA) dissections secondary to fibromuscular dysplasia. The presence of a cerebral aneurysm has clinical implications as these patients will need closer monitoring [5]

2020

Goertz et al. reported a case of a 60-year-old woman that developed left-sided hemiparesis and aphasia 9 hours after clipping of an unruptured middle cerebral artery aneurysm with heavy calcification of the aneurysm neck. Angiographic workup revealed a marked parent artery stenosis, which occurred presumably because of thrombus generation at the reconstructed aneurysm neck. Revision surgery with the relocation of the aneurysm clip was ultimately performed 19 hours after symptom onset. Although a follow-up computed tomography scan showed a small cerebral infarction, the patient recovered fully from surgery.

This case shows that relocation of the aneurysm clip in case of vessel stenosis can lead to penumbral salvage, even when performed more than 6 hours after symptom onset [6].

2017

Lyon et al. report the presentation and successful endovascular treatment of a large, ruptured, middle cerebral artery bifurcation aneurysm in a 5-week-old girl, one of only a few reported in the literature. Clinical and radiological findings at follow-up are also presented. The authors then review the literature on aneurysmal subarachnoid hemorrhage in infants, with particular regard to outcome after either endovascular or open surgical management. They also provide recommendations for follow-up in pediatric patients whose intracranial aneurysms have been treated with coil embolization [7].

2016

Sejkorová et al., analyzed a case of a ruptured middle cerebral artery (MCA) aneurysm for which they acquired imaging data at three time points, including at rupture. A patient with an observed MCA aneurysm was admitted to the emergency department with clinical symptoms of a subarachnoid hemorrhage. During three-dimensional (3D) digital subtraction angiography (DSA), the aneurysm ruptured again. Imaging data from two visits before rupture and this 3D DSA images at the moment of rupture were acquired, and computational fluid dynamics (CFD) simulations were performed. Results were used to describe the time-dependent changes of the hemodynamic variables associated with rupture. Time-dependent hemodynamic changes at the rupture location were characterized by decreased WSS and flow velocity magnitude. The impingement jet in the dome changed its position in time and the impingement area at follow-up moved near the rupture location. The results suggest that the increased WSS on the dome and increased low wall shear stress area (LSA) and decreased WSS on the daughter bleb with slower flow and slow vortex may be associated with rupture. CFD performed during the follow-up period may be part of diagnostic tools used to determine the risk of aneurysm rupture [8].

Ravindra et al., report the case of a previously healthy 6-month-old girl who presented with right arm and leg stiffening consistent with seizure activity. An initial CT scan of the head demonstrated acute subarachnoid hemorrhage in the basal cisterns extending into the left sylvian fissure. Computed tomography angiography demonstrated a 7 × 6 × 5-mm saccular aneurysm of the inferior M2 division of the left middle cerebral artery. The patient underwent left craniotomy and microsurgical clip ligation with wrapping of the aneurysm neck because the vessel appeared circumferentially dysplastic in the region of the aneurysm. Postoperative angiography demonstrated a small remnant, sluggish distal flow, but no significant cerebral vasospasm. Fifty-five days after the initial aneurysm rupture, the patient presented again with an acute intraparenchymal hemorrhage of the left anterior temporal lobe. Angiogram revealed a circumferentially dysplastic superior division of the M2 branch, with a new 5 × 4-mm saccular aneurysm distinct from the first, with 2 smaller aneurysms distal to the new ruptured aneurysm. Endovascular parent vessel occlusion with Onyx was performed. Genetic testing revealed a mutation of the MYH11. To the authors' knowledge, this is the first report of rapid de novo aneurysm formation in an infant with an MYH11 mutation. The authors review the patient's clinical presentation and management and comprehensively review the literature on this topic [9].

A 56-year-old woman with an unruptured, multi-lobulated MCA aneurysm, whom primarily refused surgery; therefore, she was scheduled for stent-assisted coiling. After successful deployment of the stent, it unfortunately then became snagged by the microcatheter and was pulled backwards. The subsequent surgical procedure (i.e. clipping of the MCA aneurysm) was challenging, due to the position of the dislodged stent. Such as misplacement of the stent is rarely documented: It resulted in the difficult handling of a MCA aneurysm. Aneurysms of the MCA should primarily be considered for surgical clipping. In conclusion, an increased risk for eventual surgery should be considered, in cases where endovascular treatments with stents are performed. [10].

2015

A case of a huge intramural hematoma in a thrombosed middle cerebral artery aneurysm. A 47-year-old female patient with liver cirrhosis and thrombocytopenia presented to the neurosurgical unit with a 5-day history of headache and cognitive dysfunction. Magnetic resonance imaging and computed tomography of the brain showed a thrombosed aneurysm located in the right middle cerebral artery with a posteriorly located huge intramural hematoma mimicking an intracerebral hematoma. Imaging studies and cerebrospinal fluid analysis showed no evidence of subarachnoid hemorrhage. Angiography showed a partially thrombosed aneurysm at the origin of the right anterior temporal artery and an incidental aneurysm at the bifurcation of the right middle cerebral artery. Both aneurysms were embolized by coiling. After embolization, the thrombosed aneurysmal sac and intramural hematoma had decreased in size 4 days later and almost completely disappeared 8 months later. This is the first reported case of a nondissecting, nonfusiform aneurysm with a huge intramural hematoma, unlike that of a dissecting aneurysm [11].

2010

Two cases of complex middle cerebral artery aneurysms that were surgically treated using the orbitopterional approach in a two-piece method. The objective of this work is to discuss the usefulness of the orbitopterional approach in the surgical management of large and giant middle cerebral artery aneurysms. A 32-year-old man with a giant aneurysm and a 50-year-old woman with a large and complex aneurysm presented with subarachnoid hemorrhages. Both aneurysms were successfully clipped through an orbitopterional approach. This approach permits a more basal view of the vascular structures with only a minor retraction of frontal lobe. It also increases the view angle and amount of working space available. This approach should be considered as an alternative to the classic pterional craniotomy for the surgical management of such complex lesions [12].

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