Complex intracranial aneurysm case series

21 patients with complex intracranial aneurysms treated with in situ interposition bypass grafting in the Department of Neurosurgery at Tianjin Huanhu Hospital from June 2015 to December 2022. The aneurysms were located in the middle cerebral artery in 16 cases, the anterior cerebral artery in 3 cases, the posterior cerebral artery in 1 case, and the posterior inferior cerebellar artery in 1 case. The interposition graft vessels were taken from the radial artery in 15 cases, the superficial temporal artery in 5 cases, and the occipital artery in 1 case. All patients underwent end-to-end anastomosis with in situ interposition bypass after aneurysm resection, including 13 cases of the “I-shaped” type, 5 cases of the “V-shaped” type, and 3 cases of the “Y-shaped” type. Postoperative digital subtraction angiography (DSA) or computed tomography angiography (CTA) reviews were performed for all the patients, and a modified Rankin Scale (mRS) score was used to assess patient prognosis. Three patients developed postoperative basal ganglia infarction and two of them recovered well. One case developed transient incomplete aphasia and one case developed mild hemiparesis, which recovered well after 3 months. The remaining 16 patients did not develop new neurological deficits. Postoperative DSA or CTA showed that the anastomosis of the bypass graft and the graft vessels were patent, and all aneurysms were eliminated. Regular postoperative follow-up ranged from 3 to 89 months, and no aneurysm recurred. The percentage of patients with mRS ≤ 2 at the final follow-up was 90.5%. Based on the experience of surgical treatment in a center, in situ, interposition bypass technique is a safe and effective option for the treatment of some complex intracranial aneurysms [1)].

A total of 71 patients with subarachnoid hemorrhage (SAH) underwent stent assisted coil embolization from 2015 to 2018 in Suzhou and Shanghai.

Among them, 59 cases were single aneurysms, and 12 cases were multiple aneurysms (11 cases with 2 aneurysms and 1 case with 3 aneurysms), for a total of 84 aneurysms. All enrolled patients received stent angioplasty except for 1 case.

There were 62 aneurysms (73.81%) treated with complete tamponade, 21 aneurysms (25.00%) treated with near-total tamponade, and 1 aneurysm (1.19%) treated with partial tamponade. All aneurysms were evaluated based on GOS (Glasgow outcome scale): 55 cases had a GOS of 5 scores, 12 cases had GOS of 4 scores, 3 cases had GOS of 3 scores, and 1 case had GOS of 1 score. There were 67 SAH patients with good prognosis (GOS of 4-5 scores). In the study, the incidence of complications was 12.7%. Three cases experienced acute thrombosis, 2 cases experienced aneurysm rupture during embolization, and 1 case experienced postoperative focal ischemic changes with mild neurological deficits.

Stent-assisted coil embolization is safe, effective, and feasible for the treatment of intracranial ruptured aneurysms. Patients had a favorable outcome of as high as 94.4%. However, clinical skills should be improved to reduce the occurrence of complications. Prompt and timely treatment for complications of intracranial ruptured aneurysm is also of great significance [2)].

Six patients with complex aneurysms were selected for 3D RP based on CTA and 3D rotational angiography data. Images were segmented using image-processing software to create virtual 3D models. Three-dimensional rapid prototyping techniques transformed the imaging data into physical 3D models, which were used and evaluated for interdisciplinary treatment planning.

In all cases, the model provided a comprehensive 3D representation of relevant anatomical structures and improved understanding of related vessels. Based on the 3D model, primary bypass surgery with subsequent reconstruction of the aneurysm was then considered advantageous in all but one patient after simulation of multiple approaches.

Preoperative prediction of intraoperative anatomy using the 3D model was considered helpful for treatment planning. The use of 3D rapid prototyping may enhance understanding of complex configurations in selected large or giant aneurysms, especially those pretreated with clips or coils [3)]

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