Hybrid cerebrovascular surgeon

Because the fields of microvascular and endovascular surgeries are both technically complex, there has been concern that hybrid cerebrovascular surgeons cannot perform each technique with the skill necessary to achieve good outcomes. When compared to clipping and coiling reviews in the neurosurgical literature, we illustrate that one hybrid neurovascular surgeon is capable of attaining great facility in both techniques and that this type of physician will represent one practice model of cerebrovascular specialist in the future. This has potential implications for the training of hybrid cerebrovascular surgeons [1)]

A study evaluated the outcomes of coiling versus clipping of unruptured anterior communicating artery aneurysms (A-com) treated by a hybrid vascular neurosurgeon to suggest the best protocol of management for these conditions.

They retrospectively reviewed the records of 70 patients with an unruptured A-com aneurysm treated with coiling or clipping performed by a hybrid vascular neurosurgeon between March 2012 and December 2019. The patients were dichotomized, into the coil group or clip group. Treatment-related complications, clinical and radiological results were evaluated.

Of the 70 patients identified, 37 underwent coiling and 33 clipping. Procedure-related symptomatic complications occurred in 2 patients (5.4%) in the coil group and 3 patients (9.1%) in the clip group. Poor clinical outcome (modified Rankin Scale [mRS] of 3 to 6) at 6 months of follow-up was seen in only one patient (2.7%) for the coil group, and none for the clip group. The one poor outcome was the result of intra-procedural rupture during coiling. Follow-up conventional angiography data (mean duration, 15.0 months) revealed that the major recanalization rate is 5.6% for the coil group and 10.0% for the clip group.

Management of A-com aneurysms requires more collaboration between microsurgical clipping and endovascular therapy. Evaluation of patient and aneurysm characteristics by considering the advantages and disadvantages of both techniques could provide an optimal treatment modality. A hybrid vascular neurosurgeon is expected to be a proper solution for the management of these conditions [2)].

Since June 2013 a hybrid operation theatre is used interdisciplinary in the department for surgery of Ulm University. In this operation theatre a floor-based flat panel c-arm, which is mounted on a robotic arm that can be controlled by the surgeon in a sterile environment, is linked to the operating table. Furthermore for the first time it was possible to integrate a navigation system in this setting. The interdisciplinary utilization (trauma, neurosurgery, cardiac and vascular surgery) makes this hybrid operation theatre very time and cost effective. In the orthopedic trauma department this system is mainly used for traumatic and oncologic pelvic and spinal injuries. In these anatomical regions the excellent image quality and large field of view of the robotic flat panel detector based 3D imaging combined with an intraoperative navigation system is a huge advantage. The system can also be used for complex fractures of the extremities. In the future there will be an integration of further imaging modalities and referenced holding devices in this setting [3)].

1)

Alexander BL, Riina HA. The combined approach to intracranial aneurysm treatment. Surg Neurol. 2009 Dec;72(6):596-606; discussion 606. doi: 10.1016/j.surneu.2009.06.027. Epub 2009 Oct 9. PMID: 19818994.
2)

Moon JS, Choi CH, Lee TH, Ko JK. Result of coiling versus clipping of unruptured anterior communicating artery aneurysms treated by a hybrid vascular neurosurgeon. J Cerebrovasc Endovasc Neurosurg. 2020 Oct 6. doi: 10.7461/jcen.2020.E2020.06.005. Epub ahead of print. PMID: 33017881.
3)

Richter PH, Gebhard F. [The interdisciplinary hybrid operation theatre. Current experience and future]. Chirurg. 2013 Dec;84(12):1036-40. doi:10.1007/s00104-013-2558-0. German. PubMed PMID: 24220954.