Internal carotid artery aneurysm treatment

In complex intracranial aneurysm of the internal carotid artery a study showed that regardless of the graft type, the middle cerebral artery pressure (MCAP) ratio (MCAPR) was associated with low-flow related ischemic complications (LRICs), which were related to late neurological worsening (NW) in patients treated by high-flow Extra intracranial bypass surgery graft [1].

Tsukada et al. included patients who underwent 3D Phase contrast cine magnetic resonance imaging before and after large internal carotid artery aneurysm treatment. Spatially and temporally averaged volume flow rates and spatially averaged systolic wall shear stress (WSS) in healthy-side internal carotid artery distal to the posterior communicating artery (C1 internal carotid artery segments according to Fisher's classification) were measured before and after parent artery occlusion and flow diverter treatments.

Seventeen patients were included (5 patients in the parent artery occlusion group and 12 in the flow diverter group). At 1-2 months after treatment, median volume flow rate in healthy-side ICA increased from 5.36 ml/sec to 6.28 ml/sec (total increase 117%, p = 0.04) in the parent artery occlusion group and from 4.65 ml/sec to 4.93 ml/sec (total increase 106%, p = 0.02) in the flow diverter group. In the parent artery occlusion group, median WSS in the C1 segment of the healthy-side ICA increased from 3.91 Pa to 5.61 Pa (total increase 143%, p = 0.08); however, no significant increase was observed in the flow diverter group (4.29 Pa to 4.57 Pa [total increase 107%, p = 0.21]).

Postoperatively, volume flow rate and WSS in the C1 segment of the healthy-side ICA significantly increased in the parent artery occlusion group. Therefore, the parent artery occlusion group was more prone to de novo aneurysm than the flow diverter group [2].

Twenty-five internal carotid artery (ICA) aneurysms in 24 patients were successfully treated by using a Jostent coronary stent graft deployed in the parent artery across the aneurysm neck. All except four aneurysms were extradural, located in the petrous or cavernous portion of the ICA. The four intradural aneurysms were located in the carotico-ophthalmic region. Seventeen aneurysms in 16 patients occurred posttraumatically, secondary to motor vehicle accidents or surgical injury.

Results: Twenty-three aneurysms were immediately excluded from circulation after stent graft placement. In two aneurysms, a slow contrast material filling (endoleak) into the aneurysm cavity was observed immediately after treatment. One was thrombosed, as shown by late control angiography; in the other one, a second larger bare stent was used to appose the stent graft's distal end to the ICA wall, thus sealing the endoleak into the distal graft. No technical adverse event, including vessel dissection, vessel perforation, or thromboembolism, occurred with or without clinical consequence. No mortality or morbidity developed during or after the procedure, including the follow-up period. Two-year control angiography in one patient, 1.5-year control angiography in two patients, 1-year control angiography in six patients, and 6-month control angiography in 12 patients were performed, revealing reconstruction of the ICA with no aneurysm recanalization. All symptoms resolved after treatment in the patients who had initially presented with mass effect.

Conclusion: Initial anatomic, clinical and mid-term follow-up results in this small series of patients are encouraging. This technique has been proved to have potential in the reconstructive treatment of

intracranial aneurysms. Further research and development are needed to optimize the stent graft technology for the cerebrovascular system [3].

Case reports

Guzzardi et al. presented the first reported Italian case of a patient with an intracranial aneurysm which was treated with Flow-diverter stent (DERIVO®; AcandisGmbH & Co. KG; Pforzheim; Germany) by direct common carotid artery puncture due to severe tortuosity of supra-aortic trunks [4]

1)
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