Stenting

A stent, is inserted to keep the blood vessel open.

see Carotid artery stenting.

Endovascular stent reconstruction is the primary intervention for cervical and intracranial dissections in symptomatic patients refractory to medical management. Advancement of traditional balloon-expanding stents into the distal internal carotid artery and vertebrobasilar artery can be technically challenging and potentially traumatic.

Indications

To assist in the coiling of wide necked aneurysms where there is risk of coil herniation into the parent artery.

Has been increasingly evaluated as a new method for treatment of symptomatic intracranial stenosis due to atherosclerosis.

Cerebrovascular arterial dissections.

The reduced risk of stroke following intracranial stent placement is offset by significantly higher procedure-associated net costs. Select procedures in patients with symptomatic stenosis of 70% or greater are more likely to be cost-effective [1)].

Venous sinus stenosis.

see Aqueductoplasty.

Types

see stent

Poststenting medical management

see aspirin

see clopidogrel

Sole stenting has been used even in cases of ruptured aneurysm, with patients on different antiplatelet medications. However, no single endovascular institute has embraced sole stenting using large cell intracranial stents as a systemized treatment for ruptured intracranial aneurysms.

Kim and Ko, designed a study to evaluate the possibility of safely treating very small aneurysms using one or two stents without coiling during the period of subarachnoid hemorrhage (SAH). A retrospective study was conducted with eight patients who had rupture of very small intracranial aneurysms (less than 3 mm in size). All were treated using the Neuroform and the Enterprise stents;

there was single stenting in five, in-stent telescopic stenting in two, and Y-configured stenting in one. The angiographic results with clinical outcomes were collected and analyzed. Complete aneurysm obliteration was observed in three cases, and size reduction or stable angiographic findings was found in five cases on the last follow-up angiography. No growing aneurysm or rebleeding was found on any follow-up angiography. Thromboembolic complications were found in one patient. It is difficult to make conclusions on the long-term efficacy of this technique with such a small number of cases, however sole stenting with a large cell intracranial stent for the treatment of very small aneurysms may be used safely as an alternative treatment even during an episode of SAH [2].

Case series

Yang et al prospectively recruited patients with intracranial aneurysms undergoing stent treatment and maintained the data in a database. MRI with diffusion-weighted sequences was performed within 24 hours of stent insertion to identify acute ischemic lesions. The authors used thromboelastography to assess the degree of platelet inhibition in response to clopidogrel and aspirin. Univariate and multivariate logistic regression analysis was used to identify potential risk factors of thromboembolism.

One hundred sixty-eight patients with 193 aneurysms were enrolled in this study. Ninety-one of 168 (54.2%) patients with acute cerebral ischemic lesions were identified by diffusion-weighted MRI. In 9 (5.4%) patients with ischemic lesions, transient ischemic attack or stroke was found at discharge, and these complications were found in 11 (6.5%) patients during the follow-up period. The incidence of periprocedural thromboembolic complications increased with resistance to antiplatelet agents, hypertension, hyperlipidemia, complete occlusion, and aneurysm of the anterior circulation. The multivariate regression analysis demonstrated that the anterior circulation and adenosine diphosphate (ADP) inhibition percentage were independent risk factors of perioperative thromboembolic complications. The maximum amplitude and ADP inhibition percentage were independent risk factors for thromboembolic complications during the follow-up period.

The ADP inhibition percentage is related to thromboembolic complications after stent placement for intracranial aneurysms. The increase of the ADP inhibition may decrease the risk of thromboembolic complications [3].

1)
Khan A, Hassan A, Suri F, Qureshi A. Cost-effectiveness analysis of intracranial stent placement versus contemporary medical management in patients with symptomatic intracranial artery stenosis. J Vasc Interv Neurol. 2013 Dec;6(2):25-9. PubMed PMID: 24358413; PubMed Central PMCID: PMC3868243.
2)
Kim YJ, Ko JH. Sole stenting with large cell stents for very small ruptured intracranial aneurysms. Interv Neuroradiol. 2014 Feb;20(1):45-53. Epub 2014 Feb 10. PubMed PMID: 24556299.
3)
Yang H, Li Y, Jiang Y. Insufficient platelet inhibition and thromboembolic complications in patients with intracranial aneurysms after stent placement. J Neurosurg. 2015 Nov 20:1-7. [Epub ahead of print] PubMed PMID: 26587657.