Flow Diverter Stent for Middle Cerebral Artery Aneurysm

- Risk Factors for Unfavorable Angiographic Outcomes after Reconstructive Endovascular Treatments of Unruptured Vertebral Artery Dissecting Aneurysms
- Flow diverter with or without adjunctive coils in the treatment of large and giant intracranial aneurysms: a meta-analysis
- Outcomes of flow diversion in intracranial aneurysms accompanied by parent artery stenosis
- Flow diversion for acutely ruptured intracranial aneurysms: A single-center retrospective analysis of 30 consecutive cases
- The Lattice flow diverter for the treatment of intracranial aneurysms: a single center experience in 117 consecutive aneurysms
- Minimizing human-induced variability in quantitative angiography for a robust and explainable AI-based occlusion prediction in flow diverter-treated aneurysms
- Efficacy and performance of the new pipeline vantage flow diverter stent with shield technology: Short-term results of a single-center experience
- Changes in preoperative and postoperative blood flow parameters are closely associated with in-stent stenosis after flow diverter treatment in unruptured intracranial aneurysms: a retrospective cohort study

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Middle cerebral artery aneurysms tend to be complex, with integrated branches and potentially wide necks. Pipeline embolization device stents are safe and effective in the middle cerebral artery aneurysm, and the patency of the side and jailed branches is preserved in most cases. Higher occlusion and lower in-stent stenosis rates are seen with longer follow-up durations [1].

However, compared to published series on the open surgical treatment of this subset of aneurysms, flow diversion has inferior outcomes and is associated with a higher rate of complications [2].

Flow diverter for middle cerebral artery aneurysm treatment should be considered an alternative when traditional treatment methods are not feasible [3].

When performed in a select treatment group, high rates of aneurysm occlusion and protection against re-rupture can be achieved [4].

Longer angiographic follow-ups are needed to assess the morphologic outcome; immediate subtotal occlusions do not seem to be related to rupture [5].

Findings suggest that complete occlusion after endovascular treatment with FDD can be delayed (>6 months). Ischemic complications may occur as early or delayed, particularly at clopidogrel interruption [6].

The Pipeline Embolization Device provides a safe and effective treatment alternative for wide-neck MCA aneurysms that give rise to a bifurcating or distal branch when other endovascular techniques are thought to be unfeasible or more risky [7].

WEB flow disruption seems to be a promising technique for the treatment of complex MCA

aneurysms, particularly those with a wide neck or unfavorable dome-to-neck ratio [8].

For Caroff et al. compared with other available therapeutic options, the flow-diverter stent does not appear to be a suitable solution for the treatment of saccular MCA bifurcation aneurysms [9].

Unsatisfactory occlusion rate in bifurcation aneurysms likely results from residual filling of the aneurysms in cases in which the jailed side branch remains patent [10].

Systematic review and meta-analysis

A systematic search of PubMed, MEDLINE, and Embase was performed for studies published from 2008 to May 2017.

According to the Preferred Reporting Items for Systematic Reviews and MetaAnalyses, Cagnazzo et al. selected studies with >5 patients describing angiographic and clinical outcomes after flow-diversion treatment of MCA aneurysms.

Random effects metaanalysis was used to pool the following outcomes: aneurysm occlusion rate, procedure-related complications, rupture rate of treated aneurysms, and occlusion of the jailed branches.

Twelve studies evaluating 244 MCA aneurysms were included in this meta-analysis. Complete/near-complete occlusion was obtained in 78.7% (95% CI, 67.8%-89.7%) of aneurysms. The rupture rate of treated aneurysms during follow-up was 0.4% per aneurysm year. The rate of treatment-related complications was 20.7% (95% CI, 14%-27.5%), and approximately 10% of complications were permanent. The mortality rate was close to 2%. Nearly 10% (95% CI, 4.7%-15.5%) of jailed arteries were occluded during follow-up, whereas 26% (95% CI, 14.4%-37.6%) had slow flow. Rates of symptoms related to occlusion and slow flow were close to 5%.

Small and retrospective series could affect the strength of the reported results.

Given the not negligible rate of treatment-related complications, flow diversion for MCA aneurysms should be considered an alternative treatment when traditional treatment methods are not feasible. However, when performed in this select treatment group, high rates of aneurysm occlusion and protection against re-rupture can be achieved [11].

Case series

Flow Diverter Stent for Middle Cerebral Artery Aneurysm case series

Case reports

Burrows et al. present the case of an adolescent with a middle cerebral artery (MCA) fusiform aneurysm which recurred following clip reconstruction and bypass. The aneurysm was successfully treated with endovascular flow diversion [12].

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