# Intracranial Aneurysm Flow Diversion

The intracranial aneurysm treatment has significantly evolved over the last decade with the advancement in endovascular techniques and devices. Flow diverters are the latest in the armamentarium for vascular reconstruction, aneurysm exclusion, and preservation of branch vessels. The possibility of treating various types of intracranial aneurysms, including those previously considered untreatable, has represented a new paradigm in the neurovascular era.

The theoretical hallmark of flow diverters in the treatment of the diseased segment harboring the aneurysm instead of treating the aneurysm itself. Flow diverters are designed to induce disruption of flow near the aneurysm neck while preserving flow into the parent vessel and adjacent branches. After flow diversion, intra-aneurysmal thrombosis occurs, followed by shrinkage of the aneurysmal sac as the thrombus organizes and retracts.

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Evidence of predictors for aneurysm occlusion after treatment with flow diverters is sparse. Current literature suggests that the absence of branch involvement, younger age, and aneurysm diameter have the highest impact on aneurysm occlusion after treatment with flow diverters. Large studies investigating high-quality data with well-defined inclusion criteria are needed for greater insight into flow diverter effectiveness [1)].

## Technique

The feasibility and efficacy of flow diversion with the PED via TRA for the treatment of intracranial aneurysms is comparable to TFA. Widespread adoption of this approach may be facilitated by improvements in device navigation and manipulation via radial-specific engineering [2)].

## Unruptured intracranial aneurysm treatment with flow diversion

Unruptured intracranial aneurysm treatment with flow diversion.

## Flow diverter for ruptured intracranial aneurysm

see Flow diverter for ruptured intracranial aneurysm.

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The endovascular treatment of intracranial aneurysms with unfavorable anatomy (large aneurysms, wide-neck) is frequently challenging and is also associated with a high incidence of significant recurrences.

Contemporary treatment for paraophthalmic artery aneurysms includes flow diversion utilizing the Pipeline Embolization Device.

## Middle cerebral artery aneurysm endovascular treatment with Flow Diverter

see Flow Diverter Stent for Middle Cerebral Artery Aneurysm.

## Intracranial Aneurysm Flow Diversion complications

Intracranial Aneurysm Flow Diversion complications

## Case series

Patients who had undergone Intracranial Aneurysm Flow Diversion using a Silk flow diverter with (scaffolding group) or without (bare flow-diverter group) a scaffolding stent were identified retrospectively and compared. Propensity score matching was used to match the aneurysms in both groups for variables with a significant difference between groups. Aneurysm occlusion rates and clinical outcomes were compared.

Results: There were 84 patients (105 aneurysms) in the bare flow-diverter group and 21 patients (22 aneurysms) in the scaffolding group (using 20 LEO stents and 1 Enterprise stent). The aneurysms in the scaffolding group were larger (mean, 13.1 [SD, 10.7] versus 7 [SD, 4.5] mm, P = .001) and more likely to be fusiform (40.9% versus 5.7%, P < .001) than in the bare flow-diverter group. After 2:1 propensity score matching, 24 aneurysms in the bare flow-diverter group and 15 in the scaffolding group were matched. Aneurysm occlusion rates did not significantly differ between groups at 1-3 months (41.2 versus 33.3%, P > .99), 3-6 months (55.5 versus 75.0%, P = .44), 7-12 months (65.0 versus 90.0%, P = .21), or beyond 1 year (73.6 versus 91.6%, P = .36). There was no difference in complication rates between the groups (P > .99).

Conclusions: Placement of a scaffolding stent before flow diversion does not adversely affect aneurysm occlusion or complication rates [3].

1)

Meyer L, Stracke CP, Bester M, Kallmes KM, Zeleňák K, Rouchaud A, Martínez-Galdámez M, Jabbour P, Nguyen TN, Siddiqui AH, Fiehler J, Gellissen S. Predictors of aneurysm occlusion after treatment with flow diverters: a systematic literature review. J Neurointerv Surg. 2023 Jun 14:jnis-2022-019993. doi: 10.1136/jnis-2022-019993. Epub ahead of print. PMID: 37316195.

2)

Weinberg JH, Sweid A, Hammoud B, Asada A, Greco-Hiranaka C, Piper K, Gooch MR, Tjoumakaris S, Herial N, Hasan D, Zarzour H, Rosenwasser RH, Jabbour P. A comparative study of transradial versus transfemoral approach for flow diversion. Neuroradiology. 2021 Feb 9. doi: 10.1007/s00234-021-02672-4. Epub ahead of print. PMID: 33560470.

3)

Poker A, Öcal O, Öztürk E, Arat A. Propensity Score Analysis of Flow Diverters Placed in Scaffolding

Stents. AJNR Am J Neuroradiol. 2021 Mar 4. doi: 10.3174/ajnr.A7040. Epub ahead of print. PMID: 33664116.