## Intracranial dural arteriovenous fistula case series

A multi institutional database of dural arteriovenous fistulas (dAVFs) was queried for demographic and angiographic data as well as untreated disease course. After dAVFs were stratified by Djindjian classification type, annual nonhemorrhagic neurological deficit (NHND) and hemorrhage rates were derived, as were risk factors for each. A multivariable Cox proportional hazards model was used to calculate hazard ratios.

Two hundred ninety-five dAVFs had at least 1 month of untreated follow-up. For 126 Type I dAVFs, there were no episodes of NHND or hemorrhage over 177 lesion-years. Respective annualized NHND and hemorrhage rates were 4.5% and 3.4% for Type II, 6.0% and 4.0% for Type III, and 4.5% and 9.1% for Type IV dAVFs. The respective annualized NHND and hemorrhage rates were 2.3% and 2.9% for asymptomatic Type II-IV dAVFs, 23.1% and 3.3% for dAVFs presenting with NHND, and 0% and 46.2% for lesions presenting with hemorrhage. On multivariate analysis, NHND presentation (HR 11.49, 95% CI 3.19-63) and leptomeningeal venous drainage (HR 5.03, 95% CI 0.42-694) were significant risk factors for NHND; hemorrhagic presentation (HR 17.67, 95% CI 2.99-117) and leptomeningeal venous drainage (HR 10.39, 95% CI 1.11-1384) were significant risk factors for hemorrhage.

All Type II-IV dAVFs should be considered for treatment. Given the high risk of rebleeding, lesions presenting with NHND and/or hemorrhage should be treated expediently <sup>1)</sup>.

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Across a cohort of 251 patients with 260 distinct dAVFs, the overall initial angiographic occlusion rate was 70%; recurrence or occult residual lesions were seen on subsequent angiography in 3% of cases. The overall complication rate was 8%, with permanent neurological complications occurring in 3% of cases. Among 102 patients with dAVFs without cortical venous reflux, rates of resolution/improvement of pulsatile tinnitus and ocular symptoms were 79% and 78%, respectively. Following the introduction of Onyx during the latter half of the study period, the number of treated dAVFs doubled; the initial angiographic occlusion rate increased significantly from 60% before the use of Onyx to 76% after (p = 0.01). In addition, during the latter period compared with the pre-Onyx period, the rate of dAVFs obliterated via a transarterial-only approach was significantly greater (43% vs 23%, p = 0.002), as was the number of dAVFs obliterated via a single arterial pedicle (29% vs 11%, p = 0.002).

Overall, in the Onyx era, the rate of initial angiographic occlusion was approximately 80%, as was the rate of meaningful clinical improvement in tinnitus and/or ocular symptoms after initial endovascular treatment of cranial dAVFs<sup>2</sup>.

Ertl et al., aimed to perform a retrospective comparison of their primary success rates, complication rates, and long-term follow-up with those of sinus-occluding (SO) treatment variants in the collective of low- and intermediate-grade lateral DAVFs (Cognard Types I-IIb).

Clinical symptoms, complication rates, and Cognard grading prior to and after endovascular DAVF

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treatment using different technical approaches was retrospectively analyzed in 36 patients with lateral DAVF Cognard Types I-IIb. The long-term success rate was determined by a standardized questionnaire.

The SO approaches offered a higher rate of definitive fistula occlusion (93% SO vs 71% SP) but were accompanied by a significantly higher complication rate (33% or 20% SO vs 0% SP). The patients interviewed reported very high satisfaction with their health in long-term follow-up in both groups.

A higher rate of definitive fistula occlusion in the SO group was attained at the price of a significantly higher complication rate. The Sinus-preserving (SP) embolization approaches offered a good primary success rate in combination with a very low complication rate. Despite some limitations of the data (e.g., a small sample size) the authors thus recommend an SP variant as the primary therapeutic option for the endovascular treatment of low- and intermediate-grade DAVFs. The SO approaches should be restricted to cases in which SP treatment does not achieve a downgrading to no worse than Cognard Type Ila<sup>3</sup>.

1)

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