

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 ¹⁾.

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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 ²⁾.

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

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 IIa ³⁾.

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Gross BA, Albuquerque FC, McDougall CG, Jankowitz BT, Jadhav AP, Jovin TG, Du R. A multi-institutional analysis of the untreated course of cerebral dural arteriovenous fistulas. J Neurosurg. 2017 Dec 15;1-6. doi: 10.3171/2017.6.JNS171090. [Epub ahead of print] PubMed PMID: 29243979.

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Gross BA, Albuquerque FC, Moon K, McDougall CG. Evolution of treatment and a detailed analysis of occlusion, recurrence, and clinical outcomes in an endovascular library of 260 dural arteriovenous fistulas. J Neurosurg. 2017 Jun;126(6):1884-1893. doi: 10.3171/2016.5.JNS16331. Epub 2016 Sep 2. PubMed PMID: 27588586.

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Ertl L, Brückmann H, Kunz M, Crispin A, Fesl G. Endovascular therapy of low- and intermediate-grade intracranial lateral dural arteriovenous fistulas: a detailed analysis of primary success rates, complication rates, and long-term follow-up of different technical approaches. J Neurosurg. 2017 Feb;126(2):360-367. doi: 10.3171/2016.2.JNS152081. PubMed PMID: 27128596.

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