DURAL ARTERIOVENOUS FISTULAS WITHOUT CORTICAL VENOUS DRAINAGE: PRESENTATION, TREATMENT AND OUTCOMES

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Background Current evidence suggests that intracranial dural arteriovenous fistulas (dAVFs) lacking cortical venous drainage (CVD) have a benign clinical course. However, there is no large study evaluating the safety/efficacy of current treatments and their impact over the natural history of no-CVD dAVFs.

Methods We conducted an analysis of the retrospectively collected multi-center Consortium for dAVF Outcomes Research (CONDOR) database. Demographics, presenting symptoms, dAVFs' angiographic features and therapeutic intervention/complications data of patients with Borden-Shucart type 1 dAVFs were reviewed. Clinical and radiological follow-up information was assessed to determine rates of new intracranial hemorrhage or non-hemorrhagic neurological deficit (NHND), worsening of venous hyperdynamic symptoms (VHS), angiographic recurrence, progression or spontaneous regression of dAVFs over time.

Results A total of 368 patients/Borden-Shucart type I dAVFs were identified. For patients with multiple dAVFs, only the largest one was included in the analysis. Mean age was 57.9±15.6 years, and 60.9% were women. Mean follow-up time was 40.1±45.2 months. The most common location was the transverse/sigmoid sinus (50.3%). Of 240 treated dAVFs, 224 (93.3%) underwent endovascular embolization, 11 (4.9%) radiosurgery alone and 5 (2.1%) open surgery as primary modality. After first embolization, most dAVFs (45.5%) achieved only partial reduction in early venous filling. Multiple complementary interventions increased complete obliteration rates from 37.5% after first embolization to 45.5% after 2 or more embolizations, and 53.8% after complimentary radiosurgery/open surgery. Immediate post-procedural complications occurred in 38 treated dAVFs (15.8%) and 7 with permanent sequelae. Of 129 completely obliterated dAVFs by any therapeutic modality, 3 (2.3%) showed angiographic recurrence/recanalization in a mean time of 10 months after treatment. Progression to Borden-Shucart types II-III was documented in 2.4% and subsequent development of new dAVF in 1.5%. Partial spontaneous regression was found in 24 out of 115 non-treated dAVFs with follow-up available (20.9%). Multivariate Cox regression analysis demonstrated that NHND or severe VHS at presentation and infratentorial location were associated with worse prognosis. Kaplan-Meier curves demonstrated no significant difference for stable/improved symptoms survival probability in treated versus non-treated dAVFs. However, estimated survival times showed better trends for treated dAVFs compared with non-treated dAVFs (179.2 months vs 163 months, Log-rank p-value = 0.12). This difference was statistically significant for treated dAVFs with 100% occlusion compared with partially-occluded dAVFs (173.2 months vs 143.9 months, Log-rank p-value < 0.001).

Conclusion Current therapeutic modalities for management of dAVFs without CVD are safe and may provide better symptom control when complete angiographic occlusion can be achieved.