



## Endovascular therapy for dural arteriovenous fistulas: a single institutional experience

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### Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of endovascular therapy for dAVFs, 2) Discuss, in small groups, results and benefits of various endovascular approaches, and 3) Identify effective multimodality therapeutic treatment plans for dAVFs that include gamma knife radiosurgery and microsurgery.

### Introduction

Dural arteriovenous fistulas (dAVF) are rare vascular malformations formed by abnormal connections between arteries within the dura mater and cerebral veins. Borden grade I dAVFs can be followed and may not require treatment. However, treatment is recommended for higher grade lesions when there is evidence of retrograde cortical venous drainage. Treatment often includes endovascular embolization alone or in conjunction with microsurgical ligation or gamma knife radiosurgery.

### Methods

We report a series of patients (N = 30) who presented to our institution between 1995 and 2014 and received endovascular treatment of their dAVF. We describe treatment, follow-up angiographic and clinical outcome, and complications.

### Results

18 patients had transverse-sigmoid sinus (TSS) dAVFs. The remaining 12 patients’ dAVFs were classified by location as follows: tentorial, superior sagittal sinus, anterior cranial fossa, middle cranial fossa, posterior cranial fossa, and cavernous sinus. Treatment of TSS dAVFs included transarterial embolization (TAE) with onyx (2), NBCA (4), PVA (10), coils (1) and transvenous embolization (TVE) with onyx (1) and coils (10). Angiographic evidence of complete occlusion without residual filling was achieved in 83% (15/18) of patients. The 3 patients with residual flow demonstrated significant clinical improvement. Treatment of non-TSS dAVFs included TAE with Onyx (1), NBCA (2), PVA (5), coils (3) and TVE with Onyx (1), coils (6). In this group, angiographic evidence of complete occlusion without residual filling was achieved in 75% (9/12) of patients. In both groups, 4 patients also received Gamma Knife radiosurgery and 5 patients had microsurgical ligation of their dAVF. Overall, endovascular-related complications occurred in 17% (5/30) of patients and included contrast allergy, vessel dissection, intracerebral hematoma, subarachnoid hemorrhage, and hyperperfusion breakthrough.

### Conclusions

Endovascular therapy via TAE and TVE are mainstays of dAVF treatment. The results of this study suggest that endovascular therapy alone may treat many dAVFs, but gamma knife radiosurgery and microsurgical ligation can provide additional curative benefits.

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