

Presence of an Aneurysm Serves as a Predictor of Hemorrhagic Presentation in Patients With Cerebral AVMs

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Introduction

Cerebral AVMs are found in 0.1% of the population. When they occur, they are often found in young, healthy individuals, and hemorrhage can be a source of unnecessary morbidity and mortality in these otherwise healthy patients. Identifying risk factors of hemorrhage could help guide decisions to treat AVMs.

Methods

A retrospective review of all patients treated for AVMs at the Jefferson Hospital for Neuroscience between 1994 and 2010. Data were collected on patient co-morbidities, presence of aneurysm, characteristics of the aneurysm, Spetzler-Martin (SM) Grade of the AVM, clinical presentation, treatment(s) received, therapeutic and clinical outcomes, as well as any complications.

Results

Of 774 AVM patients treated at the Jefferson Hospital for Neuroscience from 1994-2010, 7.5% (N=61) of the patients were found to have angiographically documented aneurysms. According to the Redekopp et al., classification: 16.4% (N=10) of the aneurysms were intranidal, 52.5% (N=32) were flow related, and 31.1% (N=19) were flow unrelated. According to the Cunha et al., classification 23% (N=14) aneurysms were Grade I, 4.9% (N=3) were Grade Ia, 19.7% (N=12) were Grade II, 21.3% (N=13) were Grade III, 31.1% (N=19) were Grade IV. Predictors of AVM hemorrhagic presentation in univariate analysis ($p < 0.20$) include: presence of an aneurysm, age > 65 , increasing number of aneurysms, hypertension, Redekop Grade 2 aneurysm, and Cunha Classification I, II, or III aneurysm.

Conclusions

The outcomes of AVM patients who present with a hemorrhage can be devastating. In patients with concurrent vascular pathologies, such as an AVM and aneurysm(s), referral to a high-volume neurovascular treatment center for treatment should be strongly considered, as these patients are at a higher risk of experiencing hemorrhagic presentation.

Learning Objectives

1. Explain aneurysm classification in the setting of a cerebral arteriovenous malformation
2. Discuss modifiable risk factors for AVM rupture
3. Identify patients with AVMs who are at high risk for rupture

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