

Posterior Fossa Arteriovenous Malformations: Increased Prevalence and Risk of Associated Aneurysms.

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Introduction

Posterior fossa AVMs are considered higher risk, and associated aneurysms engender a higher risk of poor outcome as well. We suggest that posterior fossa malformations are more prone to associated aneurysms, leading to a higher risk of hemorrhage and poor outcome.

Learning Objectives

To understand the risk of posterior fossa AVMs and associated aneurysms versus supratentorial AVMs.

Methods

A retrospective review of AVMs was performed with attention paid to location and presence of aneurysms, designated as feeder vessel or intranidal aneurysm. The hemorrhage status and origin of the hemorrhage was also reviewed.

Results

571 AVMs were analyzed, with 162 associated aneurysms identified (284 ruptured). 90 AVMs were infratentorial. 34 of those malformations (37.8%) had aneurysms: 29 with at least one feeder vessel aneurysm, 3 with intranidal aneurysms, and 3 with both. Of the 481 supratentorial AVMs, 126 (26.2%) harbored aneurysms: 82 with feeder aneurysms, 37 with intranidal and 7 with both. The overall incidence of feeder aneurysms was higher in posterior fossa AVMs, which were evident in 34.4% of infratentorial AVMs compared to 18.5% of supratentorial malformations ($P < 0.01$). Intranidal aneurysms were slightly more common supratentorially (9.2% versus 6.7%).

18 hemorrhages in the posterior fossa could be attributed to a feeder aneurysm, yielding a 58% rupture rate for those aneurysms. 17 supratentorial hemorrhages could be attributed to a feeder aneurysm, yielding a 19% aneurysm rupture rate ($p < 0.01$). This amounts to an odds ratio (OR) of 5.86 for infra versus supratentorial hemorrhages from feeder aneurysms.

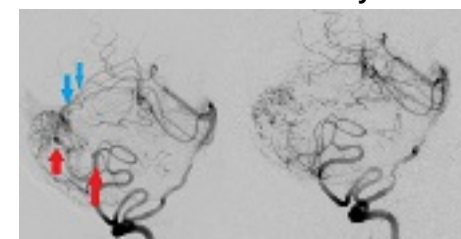
Study Data

	Infratentorial		Supratentorial		Totals
	n=patients	Percentage	n=patients	Percentage	
Total	90	15.76%	481	84.24%	571
Cerebellar	78	13.66%			
Brainstem	12	2.10%			
Hemorrhaged	60	66.67%	224	46.57%	284
Total aneurysms	34		126		160
Feeder	31	34.40%	89	18.50%	
Intranidal	5	5.56%	44	9.15%	
Both	2	2.22%	7	1.46%	
Bleed from feeder	18	58.06%	17	19.10%	

Illustrative Case:

WW is a 61 year-old male with no past medical history, who presented with one week of unrelenting headache. Initial head CT demonstrated a hemorrhage measuring 2cm x 8mm around the cerebellar vermis and he was admitted to the Neurosurgical service. CT-A showed an underlying AVM, and initial angiogram demonstrated a Spetzler-Martin grade II, Spetzler-Ponce grade A malformation, measuring 2cm and fed by the SCA and PICA. It drained into the straight sinus, as well as transverse sinus and torcular herephili. There were associated feeder and intranidal aneurysms of the SCA and PICA. Embolization was performed using nBCA glue of all feeder aneurysms. Postembolization angiographic images demonstrated occlusion of all aneurysms. Two weeks later, suboccipital craniotomy was performed for resection of the residual malformation with no resultant complications or symptoms.

AVM-associated aneurysms



Pre and post embolization

Conclusion:

Posterior fossa AVMs are more prone to developing associated aneurysms, specifically feeder vessel aneurysms. Feeder vessel aneurysms are also more likely to be the source of hemorrhage in the posterior fossa, contributing to the increased morbidity and mortality of these malformations. These high risk features may be appropriate targets for initial and prompt control by embolization or surgery due to their elevated threat.

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