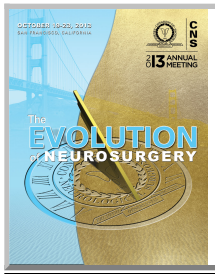

Ruptured Arteriovenous Malformations are associated with Worse Outcomes When Located in the Posterior Fossa

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Introduction

Posterior fossa AVMs are significantly more likely to present with hemorrhage than their supratentorial counterparts. We hypothesize that the debilitating effects of bleeding are more pronounced when AVMs are located in the posterior fossa.

Methods

Our prospective registry of brain arteriovenous malformations (AVMs) was searched for patients that presented with hemorrhage, had a pre-presentation modified Rankin Scale (mRS) of zero, and had a mRS reading within two days after the presentation. Overall, 136 patients were identified for inclusion. Immediate post-presentation mRS was dichotomized into "non-severe outcome" (mRS=3) and "severe outcome" (mRS>3). Univariate and multivariate logistic regression analyses using "severe outcome" as the binary response were run. We also performed a logistic regression analysis to measure the effects of hemorrhage volume and AVM location on severe outcome.

Results

Posterior fossa location was a significant predictor of severe hemorrhagic effect (OR: 2.60, 95%CI: 1.20-5.67; p=0.016) which increased in the multivariate model (OR: 4.96; 95%CI: 1.73-14.17; p=0.003). Eloquence (OR: 3.47; 95%CI: 1.37-8.80; p=0.009) and associated aneurysms (OR: 2.58; 95%CI: 1.09-6.10; p=0.031) were significant predictors of poor outcome. Hemorrhage volume for patients with a posterior fossa AVM was 10.1±10.1 cm3, while for those with supratentorial AVMs was 25.6±28.0 cm3. Posterior fossa location was a significant predictor of severe outcome (OR: 8.03; 95% CI: 1.20-53.77; p=0.033) and hemorrhage volume was suggestive of a positive association (p=0.079).

Conclusions

Posterior fossa AVMs are more likely to present with hemorrhage and to have devastating consequences than supratentorial AVMs. Age, sex, and ethnicity were not associated with an increased risk of severe outcome after AVM rupture, but posterior fossa location, associated aneurysms, and cerebellar eloquence were. Posterior fossa hematomas after AVM rupture are poorly tolerated, with severe outcomes observed with smaller volumes. These findings support an aggressive surgical posture with posterior fossa AVMs, both before and after rupture.

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