AANS/CNS Joint Cerebrovascular Annual Meeting

January 22–23, 2018 Los Angeles, CA Draining Veins and Pediatric Brain AVMs: Is There an Association between Draining Vein Number, Post-Gamma Knife Surgery Rupture, and Angiographic Obliteration?

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Introduction

Single venous drainage in brain arteriovenous malformations (AVM) has been associated with rupture. Gamma Knife Surgery (GKS) has been shown to be a feasible treatment option for pediatric AVMs considering delayed AVM obliteration with this modality. We investigated whether single draining veins are associated with post-GKS rupture and if they are associated with angiographic obliteration.

Methods

We performed a retrospective review of AVM patients, from 2010 to May 2017, who were 18 years old or below at the time of GKS. Angioarchitectural features relating to feeding arteries, nidus, and draining veins were noted. The clinical outcome of interest was post-GKS rupture or re-rupture and angiographic obliteration.

Results

There were 15 pediatric AVM patients treated with GKS in our institution. Median age at time of treatment was 12 years (6-18). Median follow-up post GKS was 38 months (5-90). Nine of fifteen (60%) were ruptured AVMs pretreatment. 8/15 (53%) had available follow-up conventional angiography (median of 35 months post GKS). 7/9 (77.78%) AVMs with single draining veins presented with rupture versus 2/6(33%) with multiple draining veins. There were no cases of post -GKS rupture in AVMs with single or multiple draining veins. 5/5 (100%) single draining AVMs had angiographic obliteration versus 1/3 (33%) with multiple draining veins. Multiple draining AVMs had larger mean volumes, 17.83ml versus 2.01 ml though the mean margin/maximum dose were equivalent, 18.25/36.5 Gy versus 18.67/37.33 Gy for single draining and multiple draining AVMs respectively.

Conclusions

Data from this small cohort of post -GKS pediatric AVMs suggest that those with a single draining vein may have higher obliteration rates than those with multiple draining veins and that the risk of rupture or re-rupture post GKS may be similar between AVMs with single and multiple draining veins. A larger cohort of patients will be helpful to validate these findings.

Learning Objectives

Features of pediatric AVMs that suggest successful outcome





4cm left posterior mesial frontal AVM supplied by left MCA, ACA, and left PCA (not shown here) branches with single venous drainage via an enlarged superficial cortical vein (arrow) toward the Superior Sagittal Sinus

