

Introduction

Due to the angioarchitectural diversity of Spetzler-Martin (SM) grade III arteriovenous malformations (AVM), the management of these lesions is incompletely defined. The aims of this multicenter, retrospective cohort study are to evaluate the outcomes after stereotactic radiosurgery for SM grade III AVMs and determine predictive factors.

Methods

We analyzed and pooled AVM radiosurgery data from eight institutions participating in the International Gamma Knife Research Foundation. Patients with SM grade III AVMs and follow-up =12 months were included in the study cohort. Optimal outcome was defined as AVM obliteration, no post-radiosurgical hemorrhage, and no permanently symptomatic radiation-induced changes (RIC).

Results

The SM grade III AVM cohort comprised 891 patients with a mean age of 34 years. The mean nidus volume, radiosurgical margin dose, and follow-up duration were 4.5 cm3, 20 Gy, and 89 months, respectively. The actuarial obliteration rate at 5 and 10 years were 63% and 78%, respectively. The annual post-radiosurgery hemorrhage rate was 1.2%. Symptomatic and permanent RIC occurred in 11% and 4%, respectively.

Optimal outcome was achieved in 56%, and it was significantly more frequent in unruptured AVMs (OR 2.3, P<0.001). The lack of prior hemorrhage (P=0.037), absence of prior AVM embolization (P=0.002), smaller nidus volume (P=0.014), absence of AVM-associated arterial aneurysms (P=0.023), and higher margin dose (P<0.001) were independent predictors of optimal outcome in the multivariate analysis.

Conclusions

Radiosurgery provided better outcomes for patients with small, unruptured SM grade III AVMs than for large or ruptured nidi. A prospective trial or registry which facilitates a comparison of radiosurgery and conservative management might further clarify our recommendations for these often high-risk AVMs.

Learning Objectives

By the conclusion of this session, participants should be able to 1) Describe the importance of stereotactic radiosurgery (SRS) for the management of patients with Spetzler-Martin (SM) grade III AVMs, 2) Discuss, in small groups, the outcomes if ruptured versus unruptured SM grade III AVMs treated with SRS, and 3) Identify an effective treatment for SM grade III AVMs.

References

Ding D, Starke RM, Kano H, Lee JY, Mathieu D, Pierce J, et al: Stereotactic radiosurgery for Spetzler-Martin Grade III arteriovenous malformations: an international multicenter study. J Neurosurg:1-13, 2016.