Spetzler Martin Grade 4

Due to the complexity of Spetzler-Martin AVM grading system IV-V arteriovenous malformations (AVMs), the management of these lesions remains controversial.

Case series

Multicenter, retrospective cohort study to evaluate the outcomes after single-session stereotactic radiosurgery (SRS) for SM Grade IV-V AVMs and determine predictive factors.

Patibandla et al. retrospectively pooled data from 233 patients (mean age 33 years) with SM Grade IV (94.4%) or V AVMs (5.6%) treated with single-session SRS at 8 participating centers in the International Gamma Knife Research Foundation. Pre-SRS embolization was performed in 71 AVMs (30.5%). The mean nidus volume, SRS margin dose, and follow-up duration were 9.7 cm3, 17.3 Gy, and 84.5 months, respectively. Statistical analyses were performed to identify factors associated with post-SRS outcomes.

At a mean follow-up interval of 84.5 months, favorable outcome was defined as AVM obliteration, no post-SRS hemorrhage, and no permanently symptomatic radiation-induced changes (RIC) and was achieved in 26.2% of patients. The actuarial obliteration rates at 3, 7, 10, and 12 years were 15%, 34%, 37%, and 42%, respectively. The annual post-SRS hemorrhage rate was 3.0%. Symptomatic and permanent RIC occurred in 10.7% and 4% of the patients, respectively. Only larger AVM diameter ($p = 0.04$) was found to be an independent predictor of unfavorable outcome in the multivariate logistic regression analysis. The rate of favorable outcome was significantly lower for unruptured SM Grade IV-V AVMs compared with ruptured ones ($p = 0.042$). Prior embolization was a negative independent predictor of AVM obliteration ($p = 0.024$) and radiologically evident RIC ($p = 0.05$) in the respective multivariate analyses.

In this multi-institutional study, single-session SRS had limited efficacy in the management of SM Grade IV-V AVMs. Favorable outcome was only achieved in a minority of unruptured SM Grade IV-V AVMs, which supports less frequent utilization of SRS for the management of these lesions. A volume-staged SRS approach for large AVMs represents an alternative approach for high-grade AVMs, but it requires further investigation [1].

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Patibandla MR, Ding D, Kano H, Xu Z, Lee JYK, Mathieu D, Whitesell J, Pierce JT, Huang PP, Kondziolka D, Feliciano C, Rodriguez-Mercado R, Almodovar L, Grills IS, Silva D, Abbassy M, Missios S, Barnett GH, Lunsford LD, Sheehan JP. Stereotactic radiosurgery for Spetzler-Martin Grade IV and V arteriovenous malformations: an international multicenter study. J Neurosurg. 2017 Sep 8:1-10. doi: 10.3171/2017.3.JNS162635. [Epub ahead of print] PubMed PMID: 28885118.