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Radiosurgery for Multiple Brain Arteriovenous Malformations in Patients with Hereditary Hemorrhagic Telangiectasia

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Abstract

Objectives:

Stereotactic radiosurgery (SRS) is a recognized treatment for arteriovenous malformations (AVMs), but its role in patients with hereditary hemorrhagic telangiectasia (HHT) and multiple brain AVMs remains underexplored. This study evaluates the outcomes of SRS in HHT patients with multiple brain AVMs.

Methods:

We conducted a retrospective review of HHT patients who underwent SRS for multiple brain AVMs between 2009 and 2024. Data on AVM characteristics, SRS treatment parameters, and follow-up outcomes were collected. Post-treatment evaluations included MRI and angiographic assessments of AVM obliteration, radiation-induced changes (RIC), and clinical outcomes.

Results:

Five HHT patients (median age 49 years) with a total of 17 AVMs underwent SRS. Of the 14 AVMs with follow-up longer than 12 months, 13 were completely obliterated after a median of 25 months. One AVM was resected due to further nidus enlargement 12 months post-SRS. Additionally, 3 recently treated AVMs with follow-up less than 12 months showed a decrease in nidus size and are currently being monitored. Transient symptomatic RIC occurred in one of the 17 treated AVMs and resolved after medical management. No post-SRS hemorrhages or permanent neurological deficits were observed. During a median follow-up of 29 months, two patients developed new intracranial AVMs, which were successfully treated with SRS.

Conclusion(s):

SRS is an effective and low-morbidity treatment option for managing multiple brain AVMs in HHT patients. The development of new AVMs during follow-up underscores the necessity for long-term surveillance. SRS offers a viable approach for addressing the complex AVM burden in this population.