

Stereotactic Radiosurgery for Central Nervous System Hemangioblastoma: Systematic Review and Meta-Analysis

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Abstract

Objectives: Hemangioblastomas are rare, benign, vascular tumors of the central nervous system (CNS), often associated with von-hippel lindau (VHL) disease. Current therapeutic options include microsurgical resection or stereotactic radiosurgery. With no randomized controlled studies and minimal data beyond single-institution reviews, the optimal management approach for patients with CNS hemangioblastomas is unclear.

Methods: We completed a Pubmed/SCOPUS literature search from January 1990 to January 2017 for eligible studies on SRS for CNS hemangioblastomas. Relevant articles were identified and reviewed in accordance to the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) guidelines.

Results: 26 studies met eligibility criteria for qualitative synthesis, representing 596 subjects and 1,535 tumors. The Gamma Knife was the most published SRS method for CNS hemangioblastomas. After critical study appraisal for intra-study bias, 14 studies were used for quantitative meta-analysis of 5-year progression free survival (PFS). The pooled 5-year PFS across all eligible studies was 88.4%. No difference was observed between spine versus intracranial studies. Individual patient data (IPD) was extracted from 14 studies, representing 322 tumors. Univariate analysis of IPD revealed that VHL patients were younger, and had smaller tumors compared to those with sporadic disease. VHL status, sex, tumor location, and tumor volume were not found to be significantly associated with tumor progression.

Conclusions: Multiple studies show excellent tumor control at 5-year follow up. The long-term efficacy of SRS for CNS hemangioblastomas still needs to be investigated, and the role of SRS as a first-line alternative to surgical resection warrants consideration.

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Abstract

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