

International Radiosurgery Research Foundation

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The International Radiosurgery Research Foundation consists of academic and clinical centers of excellence where brain Stereotactic Radiosurgery is performed using the Leksell Gamma Knife. All participating centers have a track record of outcomes research and participation in clinical trials.

The primary goal of the IRRF is to facilitate retrospective and prospective clinical trials and outcomes analysis that evaluates the role of Gamma Knife radiosurgery in a wide spectrum of clinical indications.

Because individual centers may evaluate only a small number of patients with rare conditions, pooling of information is critical to evaluate and to improve outcomes. Each center has a professional team consisting of one or more neurological surgeons, radiation oncologists, and medical physicists. Participation is by invitation of the Board of Directors. The IRRF is a non-profit scientific, educational, and research entity incorporated in the state of Pennsylvania.

Chen et al. retrospectively reviewed the International Radiosurgery Research Foundation AVM databases from 1987 to 2018. Patients were categorized into the embolization and SRS (E + SRS) or SRS alone (SRS-only) cohorts. The 2 cohorts were matched in a 1:1 ratio using propensity scores. The primary outcome was defined as AVM obliteration. Secondary outcomes were post-SRS hemorrhage, all-cause mortality, radiologic and symptomatic radiation-induced changes (RIC), and cyst formation.

The matched cohorts each comprised 101 patients. Crude AVM obliteration rates were similar between the matched E + SRS vs SRS-only cohorts (48.5% vs 54.5%; odds ratio = 0.788, P = .399). Cumulative probabilities of obliteration at 3, 4, 5, and 6 yr were also similar between the E + SRS (33.0%, 46.4%, 56.2%, and 60.8%, respectively) and SRS-only (32.9%, 46.2%, 56.0%, and 60.6%, respectively) cohorts (subhazard ratio (SHR) = 1.005, P = .981). Cumulative probabilities of radiologic RIC at 3, 4, 5, and 6 yr were lower in the E + SRS (25.0%, 25.7%, 26.7%, and 26.7%, respectively) vs SRS-only (45.3%, 46.2%, 47.8%, and 47.8%, respectively) cohort (SHR = 0.478, P = .004). Symptomatic and asymptomatic embolization-related complication rates were 8.3% and 18.6%, respectively. Rates of post-SRS hemorrhage, all-cause mortality, symptomatic RIC, and cyst formation were similar between the matched cohorts.

This study refutes the prevalent notion that AVM embolization negatively affects the likelihood of obliteration after SRS ¹⁾.

Nidal embolization using Onyx does not appear to differentially impact the outcomes of AVM SRS compared with non-Onyx embolysates. The embolic agent selected for pre-SRS AVM embolization should reflect both the experience of the neurointerventionalist and target of endovascular intervention ²⁾.

Approximately one-quarter of pediatric AVMs that become obliterated after SRS will achieve this radiological endpoint within 24 months of initial SRS. The authors identified multiple factors associated with early obliteration, which may aid in prognostication and management. The overall risks of delayed hemorrhage, RICs, cyst formation, and tumor formation were not statistically different in patients with early versus late obliteration ³⁾.

Publications

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