Intracranial solitary fibrous tumor

Intracranial solitary fibrous tumors (SFTs) are rare mesenchymal tumors of the central nervous system. They were previously considered distinct from hemangiopericytomas (HPCs) but are now grouped together in the 2021 WHO Classification as a single entity: **solitary fibrous tumor/hemangiopericytoma (SFT/HPC)**.

Classification

According to the WHO 2021 CNS tumor classification:

- **Grade I**: Classic SFT – low cellularity, abundant collagen, benign histology.
- **Grade II**: Intermediate cellularity, more mitotic activity.
- **Grade III**: Anaplastic SFT – high mitotic index (≥5 mitoses/10 HPF), necrosis, aggressive behavior.

Treatment

- **Gross Total Resection (GTR)** is the primary treatment goal.
- **Postoperative Radiotherapy (PORT)**:
  - Recommended especially for Grade II/III or subtotal resection.
  - Improves local control and progression-free survival.
- **Recurrence** and **extracranial metastases** are possible, especially in higher grades.

Systematic review and meta-analysis

In a systematic review and metaanalysis Na et al. from the Hanyang University, Seoul; Kangnam Sacred Heart Hospital, Seoul; Chung-Ang University, Seoul & Gwangmyeong; Dongsan Medical Center, Daegu published in the Journal Scientific Reports (Nature) to determine whether postoperative radiotherapy (PORT) after gross total resection (GTR) of intracranial solitary fibrous tumors (SFT) improves Progression-Free Survival (PFS), overall survival (OS), and metastasis-free survival (MFS). PORT significantly improved both PFS and OS after GTR; no effect on MFS. Authors suggest PORT should be considered for all intracranial SFT patients post-GTR [1].

Critical appraisal

* **Scope & relevance** – Addresses a clinically important and under-consensus management question: role of radiotherapy after resection of rare intracranial SFT.

* **Methodology** – Follows PRISMA guidelines; searched Medline, Embase, Cochrane. Included 12 studies totalling 419 patients. Meta-analysis of hazard ratios for survival. However, heterogeneity among included studies—some retrospective, variable PORT protocols (dose, timing), inconsistent follow-up durations.

* **Statistical strength** – Pooled HRs show clear benefit in PFS and OS. Subgroup analysis for grades 2–3 supports findings. Yet, no mention of publication-bias assessments (e.g., funnel-plot or Egger's test) or sensitivity analyses excluding poor-quality studies.

* **Limitations** – Lack of detailed quality scoring for individual studies; variation in grading systems over time (hemangiopericytoma terminology overlap); absence of toxicity or quality-of-life data post-PORT; no randomized controlled trials included.

* **Clinical impact** – Suggests consistent survival advantage favoring PORT, but generalizability is limited by retrospective data and tumor rarity.

Final Verdict

While methodologically sound and compelling in its aggregate survival benefit findings, the evidence remains moderate due to heterogeneity and retrospective design. More robust prospective data are needed, but in high-grade or borderline cases, PORT can be strongly considered.

Rating:: 7.5 / 10

Takeaway for practicing neurosurgeon

After gross total resection of intracranial solitary fibrous tumors—especially WHO grade 2 or 3—adjuvant radiotherapy appears to provide meaningful improvements in both progression-free and overall survival. Given the retrospective evidence, surgeons and neuro-oncologists should include PORT in multidisciplinary discussions and patient counseling.

Bottom line:: In the absence of randomized evidence, PORT is a reasonable addition to surgery for intracranial SFT to extend survival.

Corresponding author's email:: kwonsaemin@hanmail.net

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Na MK, Choi KS, Lim TH, Shin H, Lee J, Lee H, Kim W, Kim JG, Cho Y, Ahn C, Kim JH, Jang BH, Namgung M, Kwon SM. A systematic review and meta-analysis on the efficacy of postoperative radiotherapy after gross total resection of intracranial solitary fibrous tumors. Sci Rep. 2025 Jul 2;15(1):23368. doi: 10.1038/s41598-025-02170-0. PMID: 40603922.