Intracranial Solitary Fibrous Tumor Treatment

- A clinical investigation of extracranial metastases in 17 cases of intracranial solitary fibrous tumors
- A systematic review and meta-analysis on the efficacy of postoperative radiotherapy after gross total resection of intracranial solitary fibrous tumors
- Differential diagnosis of intracranial solitary fibrous tumor and high-grade meningioma based on CT and MRI features
- A Case of Intracranial Solitary Fibrous Tumor Followed by Distant Metastasis without Local Recurrence
- Meningeal malignant solitary fibrous tumor with multiple recurrence, extracranial extension, cervical lymph node metastases: case report and review of the literature
- Postoperative stereotactic radiosurgery for intracranial solitary fibrous tumors/hemangiopericytomas: A systematic review and meta-analysis
- Low-grade intracranial solitary fibrous tumor with early metastasis to lumbar spine and recurrence twice: case report
- Apparent Diffusion Coefficient (ADC) and Magnetic Resonance Imaging (MRI) Nomogram for Differentiating a Solitary Fibrous Tumor (World Health Organization Grade II) From an Angiomatous Meningioma

The management of **intracranial solitary fibrous tumors (SFTs)** is based on histological grade, resection extent, and recurrence risk. Due to their potential for recurrence and metastasis, even many years after diagnosis, long-term follow-up and multimodal treatment are often warranted.

Primary Treatment

- **Gross Total Resection (GTR)**:
  - Mainstay of treatment for all WHO grades.
  - Achieving GTR significantly improves **local control** and **progression-free survival** (PFS).
  - Intraoperative navigation and careful dural dissection may assist in achieving clear margins.

Postoperative Radiotherapy (PORT)

- **Indicated in the following scenarios**:
  - WHO **Grade II or III** tumors
  - **Subtotal resection (STR)**
  - Recurrent disease
- Improves **local control**, especially in high-grade or incompletely resected tumors.
- Techniques:
  - **External Beam Radiotherapy (EBRT)**
  - **Stereotactic Radiotherapy (SRT)** for focal or residual disease
  - Dose range: 50–60 Gy in conventional fractionation

Role of Chemotherapy

- Generally **limited** due to lack of robust evidence.
- May be considered in:
  - **High-grade, metastatic, or unresectable tumors**
  - **Recurrent disease** after surgery and radiotherapy
- Agents used (off-label): temozolomide, bevacizumab, or anthracycline-based regimens

Recurrence and Metastasis

- Even **Grade I SFTs** can recur locally.
- Grades II–III are associated with:
  - Higher recurrence rates
  - Distant metastases (e.g., lung, liver, bone)
- **Surveillance imaging** (MRI) is recommended:
  - Every 6 months for the first 2–3 years
  - Annually thereafter for long-term follow-up

Summary Table

Treatment Modality	Indication	Notes
Gross Total Resection	All grades	Aim for complete resection with clear margins
Postoperative Radiotherapy	Grade II–III, STR, recurrence	Improves local control
Chemotherapy	Refractory, metastatic cases	Limited evidence; palliative role
Surveillance Imaging	All patients	Lifelong follow-up due to delayed recurrence/metastasis

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.

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1)
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.