

**Introduction**

Microsurgery (MS) and stereotactic radiosurgery (SRS) remain the preferred interventions for the curative treatment of brain arteriovenous malformations (AVM), but their relative efficacy remains incompletely defined. The aim of this retrospective, matched cohort study is to compare the outcomes of MS to SRS for AVMs.

**Methods**

We evaluated institutional databases of AVM patients who underwent MS and SRS. MS-treated patients were matched, in a 1:1 ratio based on patient and AVM characteristics, to SRS-treated patients. Statistical analyses were performed to compare outcomes data between the two cohorts. The primary outcome was defined as AVM obliteration without a new permanent neurological deficit.

**Results**

The matched MS and SRS cohorts were each comprised of 59 patients. Both radiologic (85 vs. 11 months;  $p<0.001$ ) and clinical (92 vs. 12 months;  $p<0.001$ ) follow- up were significantly longer for the SRS cohort. The primary outcome was achieved in 69% of each cohort. The MS cohort had a significantly higher obliteration rate (98% vs. 72%;  $p=0.001$ ), but also had a significantly higher rate of new permanent deficit (31% vs. 10%;  $p=0.011$ ). The post-treatment hemorrhage rate was significantly higher for the SRS cohort (10% for SRS vs. 0% for MS;  $p=0.027$ ). In subgroup analyses of ruptured and unruptured AVMs, no significant differences between the primary outcome were observed.

**Conclusions**

For patients with angioarchitecturally comparable AVMs, MS and SRS afford similar rates of deficit-free obliteration. Nidal obliteration is more frequently achieved with MS, but this intervention also incurs a greater risk of new permanent neurological deficit.

**Learning Objectives**

By the conclusion of this session, participants should be able to:

- 1) describe the efficacy of microsurgery and stereotactic radiosurgery in AVM treatment,
- 2) describe complication rates associated with microsurgery and stereotactic radiosurgery in AVM treatment
- 3) use the results of this study to help identify optimal treatment for patients with AVM.