



## CEREBRAL MICRO-ARTERIOVENOUS MALFORMATIONS

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### Resumen

**Objectives:** Micro-arteriovenous malformations are a rare subgroup of brain AVMs, characterized by a nidus of less than 1 cm. Our purpose was to assess the clinical presentation, radiological features, therapeutic management and outcome of these lesions.

**Methods:** We retrospectively reviewed all angiographies performed at our Institution since 2000 for diagnosis of AVMs. We selected a total of 33 patients who presented AVMs with a nidus diameter of less than 1 cm or without clearly identifiable nidus but an early draining vein. We evaluated clinicoradiological findings, therapeutic management and outcome.

**Results:** All patients, except two, presented with intracranial hemorrhage and in 15 patients with focal deficit. Hematomas were large (mean volume 25 cc) and in 9 patients were evacuated urgently. In seven patients, cerebral DSA was normal. MRI and dynamic MRA revealed the AVM in 4 of the 7 patients in whom initial DSA was negative. Treatment of the AVM was surgery in 17 cases, radiosurgery in 8 cases and endovascular embolization in 3, all with no post-procedural deficits. Five patients received no treatment due to their poor condition. All patients treated with surgery had their AVM occluded. One of the AVM initially occluded with embolization had to be retreated with radiosurgery due to a recanalization 2 years later. Six of the 8 treated with radiosurgery were occluded at time the follow up. Glasgow Outcome Scale score was good for 29 patients (87% GOS 4-5); and poor (GOS 3-2) in 4 patients (13%).

**Conclusions:** Micro-AVMs present with large intracranial hemorrhages with neurologic deficit. If angiography is negative delayed or superselective angiography is recommended. MR may reveal the existence of these lesions. Surgery is the treatment of choice in superficial micro-AVMs and radiosurgery or embolization can be considered in deep lesions. Patients with occluded AMVs with embolization should be followed, as recanalization is possible.