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LECTURE

Criteria for the endovascular treatment of brain vascular malformations

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Abstract

Brain Arteriovenous Malformations (AVMs) are abnormalities of the intracranial vessels regarding a connection between the arterial and venous systems without an intervening normal capillary bed. Patients with AVMs are at a lifelong risk for haemorrhagic strokes (1.4% to 2% of all haemorrhagic strokes), but their natural history, especially for those unruptured, is still poorly understood. When symptomatic, they can present with intracranial haemorrhage, seizures, headaches or other focal neurologic deficits unrelated to haemorrhage that can be due to vascular steal phenomenon and/or venous hypertension. AVMs can be graded according to size, location and pattern of venous drainage. The gold standard for diagnosis of AVM is cerebral angiography; however, the evolution of non-invasive imaging has helped with the detection of AVMs and the proportion of AVMs diagnosed still unruptured has almost doubled over the past decades, which now brings new challenges regarding their management. Prior haemorrhage, deep AVM location, exclusively deep venous drainage and associated aneurysms constitute significant risk factors for AVM haemorrhage. Previous series demonstrated an overall annual haemorrhage rate of 3.0% for AVMs, the annual re-bleeding rate as 4.5% and at least 6% in the first year after haemorrhage. Today, different management options are available for AVMs, such as medical management alone, microsurgical resection, stereotactic radiosurgery and endovascular embolization. Management of these lesions is complicated by the fact that AVMs form a very heterogeneous group of lesions, with variable locations, morphologies and angioarchitecture, imparting different risk of haemorrhage for each patient and, thus, requiring individualized treatment decisions. Also, the risks associated with treating a given AVM patient vary and must be weighted individually against the natural history of haemorrhage anticipated in that particular patient. The appropriate management of patients with AVMs can therefore range from simple observation to aggressive multimodality approach aimed at total AVM obliteration.

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