Cavernous malformation Magnetic resonance imaging

Diagnostic test of choice. MRI with either gradient-echo T2WI or susceptibility-weighted (SWI) images is the most sensitive test due to high sensitivity to susceptibility artifact from blood breakdown products within and around CMs. Findings are similar to AOVM in general (mixed-signal core with low signal rim—sometimes described as “popcorn” pattern;); The diagnosis is strongly suggested by finding multiple lesions with these characteristics and positive family history [1)].

A venous malformation may be seen adjacent to a solitary CM, but not with multiple CMs [2)]. Diffusion tensor imaging/white matter tractography and pre-op 3D-constructive interference in steady-state (CISS) MRI [3)] may improve localization, approach, and post-op outcomes.

Gadolinium contrasted MRI may be helpful for identifying possible associated DVAs or capillary telangiectasia or to exclude tumors in questionable cases.

In the absence of spine symptoms, routine imaging of the spine is not indicated in patients with cerebral CMs [4)].

1)
Rigamonti D, Drayer BP, Johnson PC, et al. The MRI Appearance of Cavernous Malformations (Angiomas). J Neurosurg. 1987; 67:518–524
2)
Abdulrauf SI, Kaynar MY, Awad IA. A comparison of the clinical profile of cavernous malformations with and without associated venous malformations. Neurosurgery. 1999; 44:41–6; discussion 46-7
3)
Zausinger S, Yousry I, Brueckmann H, et al. Cavernous malformations of the brainstem: three-dimensional-constructive interference in steady-state magnetic resonance imaging for improvement of surgical approach and clinical results. Neurosurgery. 2006; 58:322–30; discussion 322-30
4)
Akers A, Al-Shahi Salman R, et al. Synopsis of Guidelines for the Clinical Management of Cerebral Cavernous Malformations: Consensus Recommendations Based on Systematic Literature Review by the Angioma Alliance Scientific Advisory Board Clinical Experts Panel. Neurosurgery. 2017; 80:665–680