Cavernous malformation diagnosis

CMs were difficult to diagnose in the pre-MRI era. They are invisible on angiogram and thus the term AOVM (angiographically occult arteriovenous malformation) was sometimes used. However, the venous angioma sometimes seen in association with a CM was visible on angiogram, and thus believed to be the source of the hemorrhage seen, even though in reality it was the CM that had hemorrhaged. Thus, venous angiomas were sometimes treated, also with radiosurgery, a management that was soon aborted [1)].

The introduction of MR imaging increased the number of diagnosed CMs as a CM that has hemorrhaged has a typical appearance on MR images (MRI). An unruptured CM cannot, however, be seen. Consequently, a CM diagnosed in a patient with an earlier normal MRI does not necessarily represent a denovo CM. It may be a CM that was present but invisible on an earlier scan that now can be seen due to an earlier hemorrhage with sequel signals depicted on MRI [2)].

Practice guideline: Imaging recommendations for cavernous malformations

1. Level I: brain MRI for the diagnosis and follow-up of known or suspected CMs

2. Level I: MRI should include gradient echo or susceptibility-weighted sequences

3. Level III: catheter angiography is not recommended unless an AVM is suspected

4. Level I: follow-up imaging should be done to assess new or worsened symptoms to guide treatment decisions. There is insufficient data to make recommendations regarding the timing of routine surveillance imaging.

CT

Not sensitive: CT misses many small lesions, some large ones, and even some that have bled.

Not specific: CT findings may overlap with low-grade tumors, hemorrhages, granulomas. Isolated multifocal calcifications may suggest the diagnosis. Contrast CT may be helpful when MRI cannot be done

CT scans are usually more readily available than MRI, and can rule out emergent conditions such as significant hematoma, hydrocephalus, and mass effect.

MRI

Cavernous malformation Magnetic resonance imaging

Angiography

Does not demonstrate lesion. MRI appearance is nearly pathognomonic, and angiography is not necessary in classically appearing cases. Angiography may be needed to R/O other diagnoses in questionable cases.

Familial considerations

First degree relatives of patients with more than one family member having a cavernous malformation should have MRI screening and appropriate genetic counseling.

1)
Lindquist C, Guo WY, Karlsson B, Steiner L (1993) Radiosurgery for venous angiomas. J Neurosurg 78:531–536
2)
Karlsson B, Wu B, Guo WY, Yeo TT. Pseudocavernoma-a new diagnosis? Acta Neurochir (Wien). 2018 Nov 17. doi: 10.1007/s00701-018-3735-1. [Epub ahead of print] PubMed PMID: 30448876.