

Evidence Discussion (HD-12)

- After the initial identification of a subarachnoid hemorrhage, the search for a ruptured cerebral aneurysm begins with imaging of the cerebral vessels with CT Angiography (CTA), MR Angiography (MRA) or diagnostic cervico-cerebral catheter angiography.¹
- CTA head has over 90% sensitivity and specificity for the diagnosis of cerebral aneurysm in the setting of subarachnoid hemorrhage.¹
- MRA head has a sensitivity of 95% and a specificity of 89% for diagnosis of cerebral aneurysm.¹
- Diagnostic cervico-cerebral catheter angiography has the highest spatial and temporal resolution of any vascular imaging study, however, is invasive and requires use of contrast¹. It has a sensitivity and specificity over 98% for identification of aneurysm and can also diagnose vascular abnormalities in up to 13% with subarachnoid hemorrhage and a negative CTA¹. In addition, this modality can identify an aneurysm in 25% of previously negative studies and repeat studies are supported for this reason.¹
- In select cases of subarachnoid hemorrhage when an intracranial aneurysm is not identified, imaging the neck vessels and spinal vessels is appropriate.⁷
- Aneurysm growth ranges from 4% to 14% on follow up imaging¹. For surveillance of incidentally identified cerebral aneurysms or ruptured and/or treated aneurysms, the less invasive modalities, CTA and/or MRA are supported, over the more invasive diagnostic cervico-cerebral angiography.¹
- Screening for cerebral aneurysms in high risk patient populations is also recommended with the less invasive modalities, CTA head or MRA head.¹ This includes patients with autosomal dominant polycystic kidney disease (ADPKD), who had a prevalence of cerebral aneurysm ranging from 10-11.5%.¹ The American Heart Association recommends screening those with at least 2 family members with cerebral aneurysm or subarachnoid hemorrhage.¹ Screening is also recommended for conditions with known increased risk of cerebral aneurysm.^{1,6}
- Although vascular imaging is the primary focus of neuroimaging in the diagnosis and follow up of cerebral aneurysms, parenchymal imaging with MRI brain may be helpful in select clinical scenarios including giant aneurysms, posterior fossa aneurysms, in the setting of cranial neuropathies or focal neurologic findings and suspected stroke.⁷
- Cervicocerebral angiography is the gold standard for imaging arteriovenous malformations (AVM) and arteriovenous fistulas (AVF)¹. CT Angiography head (CTA) has a 90% sensitivity for the overall detection of AVMs and 100% for AVMs > 3 cm in size¹. In the evaluation of pulsatile tinnitus, CTA has a sensitivity of 86% with a specificity of 100% in identifying high flow AVFs¹. MR Angiography (MRA) is an alternative modality in these scenarios.¹
- MRI brain for diagnosis and follow up of AVM has an overall sensitivity of 89% and 100% for lesions > 3 cm in size.¹

References

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