

# Imaging and Treatment of Intracranial Aneurysms

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**B**erry aneurysms are the most common type of intracranial aneurysm with a prevalence of 1.5-2%.

They can uncommonly produce symptoms from mass effect on nearby structures resulting in painful 3rd nerve palsy (posterior communicating artery), bitemporal hemianopia (anterior communicating artery) or multiple cranial nerve palsies (cavernous sinus).

The most common presentation is aneurysm rupture and resultant subarachnoid haemorrhage, with potentially devastating outcomes. The risk of a bleed depends largely on size, with aneurysms greater than 10 mm having a rupture rate of 3-4% pa. The risk of rupture in an aneurysm less than 6 mm is controversial but is probably less than 0.1% pa.

Most are sporadic and result at points of vessel bifurcation where the media is thinned. They are more common in smokers and females. Inherited risk factors are racial (Norwegians), adult polycystic disease, collagen disorders and idiopathic familial inheritance.

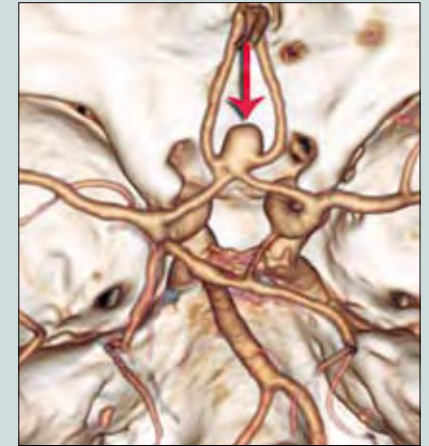
The introduction of non-invasive imaging, modern microvascular surgery and endovascular coiling have made the diagnosis and treatment of non-ruptured aneurysms possible in many cases.

It is reasonable to perform CTA (CT angiography) or MRA (magnetic resonance angiography) on patients with a CT or MRI suspicious of aneurysm, a family history of 2 first-degree relatives with an aneurysm, or a history suggestive of SAH.

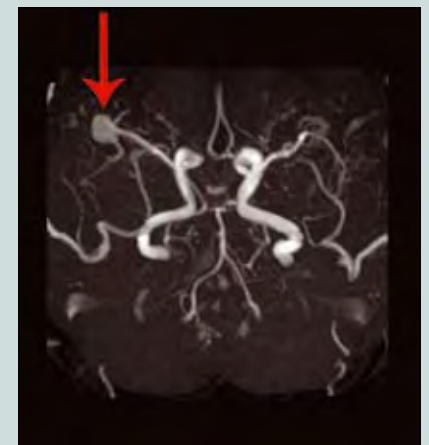
Modern 64-slice CTA with an appropriate workstation and reconstruction algorithms has a slightly better spatial resolution than MRA. This is at the cost of radiation and the very low but defined risk of allergy to contrast media. MRA is truly non-invasive with no contrast injection or radiation, but is less readily available. Either modality is acceptable. Review and reporting of the scans by an experienced Neuroradiologist is appropriate for detection of small aneurysms (2-3 mm), knowledge of normal variants, absence of false positives, and assessment of the need for and performance of pre-treatment angiography to clarify aneurysm characteristics. The role of endovascular treatment can also be discussed.

Cooperative multidisciplinary management between interventional Neuroradiology and Neurosurgery in WA triages each patient to the safest and most effective treatment (or non-treatment) depending on position, morphology and size of aneurysm. This is studied together with the age, co-morbidities and expectations of the patient.

Endovascular coiling is the preferred treatment in about 70-75 % of cases with the remainder being clipped surgically. Aneurysms of suitable morphology are treated at 6mm and greater. Treatment with a stroke and death rate of 1.5-2.5% in a young patient with suitable aneurysm



■ Fig 1. CTA of wide necked anterior communicating artery aneurysm.



■ Fig 2. MRA of wide necked right middle cerebral artery aneurysm.

morphology is possible. The low rate of complications can result in coiling of smaller aneurysms, particularly in anxious patients who are carrying the unknown risk and consequences of rupture for many years.

Coiled aneurysms are followed with diagnostic angiography for up to 5 years to ensure stability of result. Screening MRA is then advocated 5 yearly.

If an aneurysm is being monitored, the most appropriate modality is MRA with scans 1-2 yearly.