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Clinics in Diagnostic Imaging (28)

P D Corr, D Royston

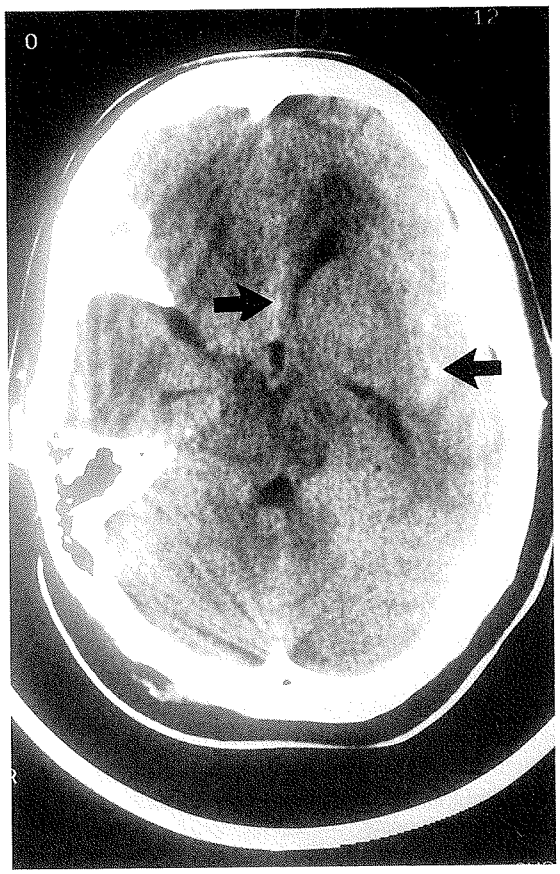

Fig 1 - Non-contrast CT scan.

CASE REPORT

A 44-year-old woman presented to the casualty department with a sudden onset of severe headache. On examination, the patient was lucid and fully conscious. However, definite neck stiffness was demonstrated. The fundi were normal and there was no neurological deficit. A non-contrast computed tomography (CT) scan was performed (Fig 1). CT and magnetic resonance (MR) angiography were done later that same day (Figs 2a and b). What is your diagnosis?

Fig 2a - CT angiogram of the Circle of Willis.

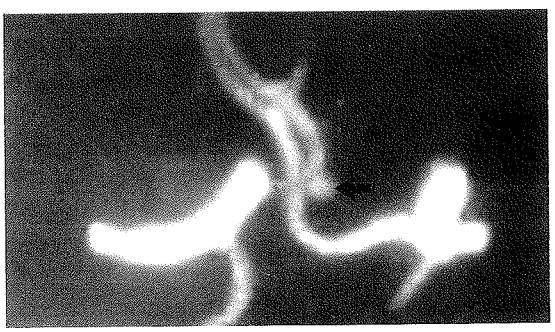

Fig 2b - MR angiogram.

Department of Diagnostic Radiology
Faculty of Medicine
University of Natal
Durban, South Africa

P D Corr, MBChB, FRCR, FFRad (SA)
Professor and Head

Department of Diagnostic Radiology
Wentworth Hospital
Durban, South Africa

D Royston, MBChB, FFRad (SA)
Consultant

Correspondence to:
Prof P D Corr

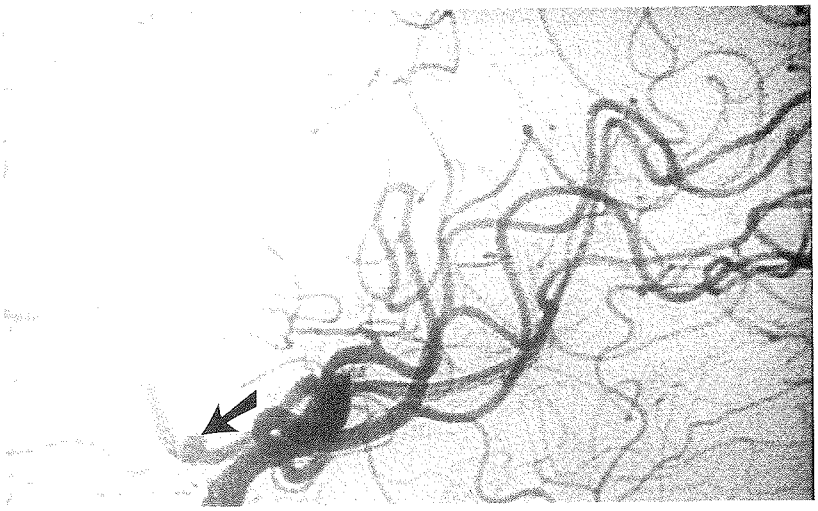

Fig 3 - Digital subtraction angiogram confirms a berry aneurysm (arrow) arising from the anterior communicating artery.

IMAGE INTERPRETATION

The CT scan (Fig 1) showed areas of increased density in the left Sylvian fissure and the inter-hemispheric fissure (arrows), typical of subarachnoid haemorrhage. The CT and MR angiograms (Figs 2a and b) demonstrated a small saccular or "berry" aneurysm (arrow) arising from the anterior communicating artery. This finding was confirmed on the digital subtraction angiogram (Fig 3).

DIAGNOSIS

Subarachnoid haemorrhage due to a ruptured anterior communicating artery aneurysm

CLINICAL COURSE

This aneurysm was confirmed to be the source of haemorrhage at surgery and was clipped successfully. The patient made a full recovery subsequently.

DISCUSSION

The most common presentation of intracerebral aneurysm is subarachnoid haemorrhage. Most aneurysms are asymptomatic until they rupture. Saccular (or "berry") aneurysms are not congenital in origin as originally thought, but result from haemodynamically-induced degenerative vascular injury[1]. Excessive stress on the walls of arteries, especially at the bifurcations, result in dilatation of the vascular lumen and aneurysm formation[1].

The true incidence of aneurysms is unknown but it is thought to be between 1% and 5% of the population[2]. Aneurysms are multiple in 15% to 20% of patients. Certain conditions such as polycystic kidney disease, aortic coarctation, fibromuscular dysplasia, Marfan's syndrome and Ehlers-Danlos syndrome are associated with an increased incidence[3]. Most aneurysms arise from the Circle of Willis or the middle cerebral artery bifurcation.

Conventional non-contrast CT remains the best imaging investigation to detect subarachnoid haemorrhage. The sensitivity varies from 60% to 100% in the first 24 hours after the haemorrhage. After 24 hours, the sensitivity drops considerably. MR imaging is insensitive to the detection of acute subarachnoid haemorrhage[4]. The definitive investigation to detect intracerebral aneurysms remains four-vessel digital subtraction angiography. It is important to identify all aneurysms, their relationships to the parent vessels, the presence of collateral flow and vasospasm[5]. Both CT and MR angiography (Figs 2a and b) show promise as screening investigations to detect aneurysms. However, these two modalities have pitfalls which can make interpretation difficult, especially if performed by inexperienced radiologists[6,7]. CT angiography is especially useful to demonstrate the morphology of the aneurysm sac and neck, both for surgical clipping and endovascular occlusion of the aneurysm using coils.

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ABSTRACT

A 44-year-old man presented with sudden headache and neck stiffness. Computed tomography (CT) demonstrated subarachnoid haemorrhage. CT and magnetic resonance (MR) angiography showed the cause to be a ruptured anterior communicating artery aneurysm. These findings were confirmed by digital subtraction angiogram and at surgery. The role of imaging in detection of cerebral aneurysms is briefly discussed.

Keywords: angiography; cerebral aneurysm; Circle of Willis; CT angiography; MR angiography