CEREBRO VASCULAR ACCEDANT (CVA) PRACTICAL

PRESENTED BY

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CEREBRO VASCULAR ACCEDANT (CVA)

- Neurological deficit of cerebrovascular cause that persists beyond 24 hours .

- **Transient ischemic attack (TIA),** which is a related syndrome of stroke symptoms that resolve completely within 24 hours.

CLASSIFICATION

Ischemic stroke

Caused by interruption of the blood supply to the brain

About 85%

Hemorrhagic stroke

hemorrhagic strokes result from the rupture of a blood vessel or an abnormal vascular structure

About 15%

The main risk factor for stroke is high blood pressure.

Other risk factors include tobacco smoking, obesity, high blood cholesterol, diabetes mellitus, a previous TIA, end-stage kidney disease, and atrial fibrillation

Ischemic stroke

In an ischemic stroke, blood supply to part of the brain is decreased, leading to dysfunction of the brain tissue in that area. There are four reasons why this might happen:

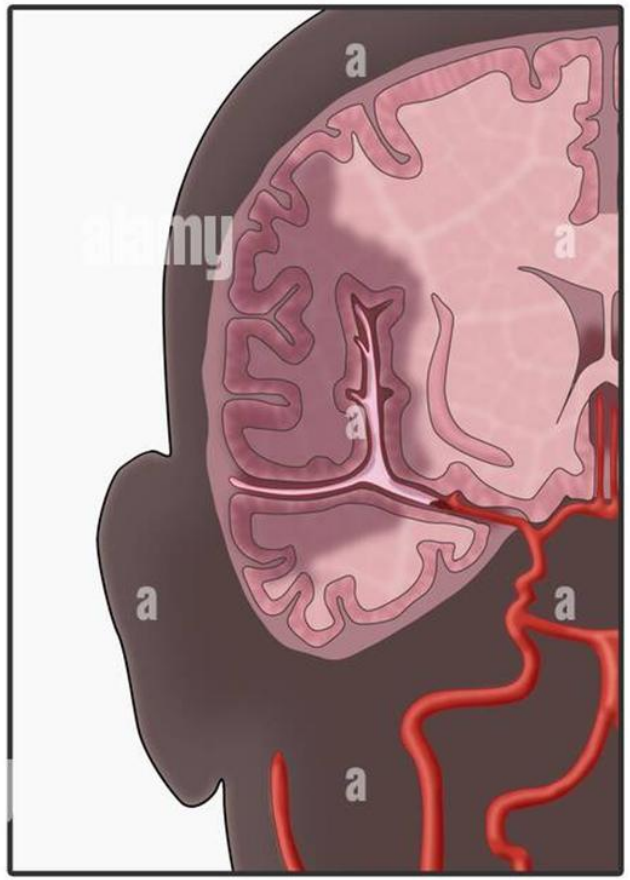
- Thrombosis (obstruction of a blood vessel by a blood clot forming locally).
- Embolism (obstruction due to an embolus from elsewhere in the body).
- Systemic hypoperfusion (general decrease in blood supply, e.g., in shock)
- Cerebral venous sinus thrombosis.

Hemorrhagic Stroke

There are two main types of hemorrhagic stroke:

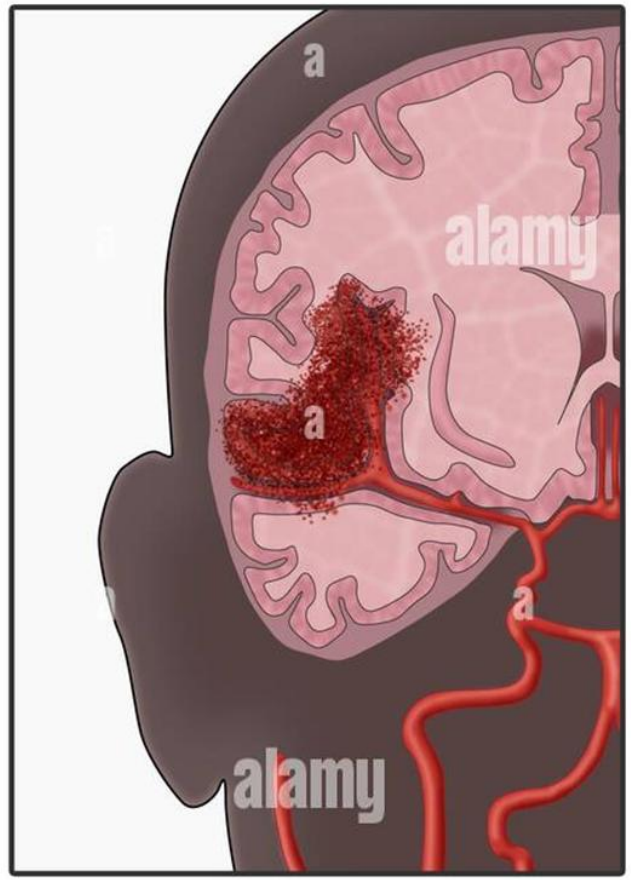
- Intracerebral hemorrhage, which is basically bleeding within the brain itself .
- Subarachnoid hemorrhage, which is basically bleeding that occurs outside of the brain tissue but still within the skull, and precisely between the arachnoid mater and pia mater.
- Hemorrhagic strokes may occur on the background of alterations to the blood vessels in the brain, such as cerebral AV malformation and an intracranial aneurysm, which can cause intraparenchymal or subarachnoid hemorrhage

Ischemic stroke

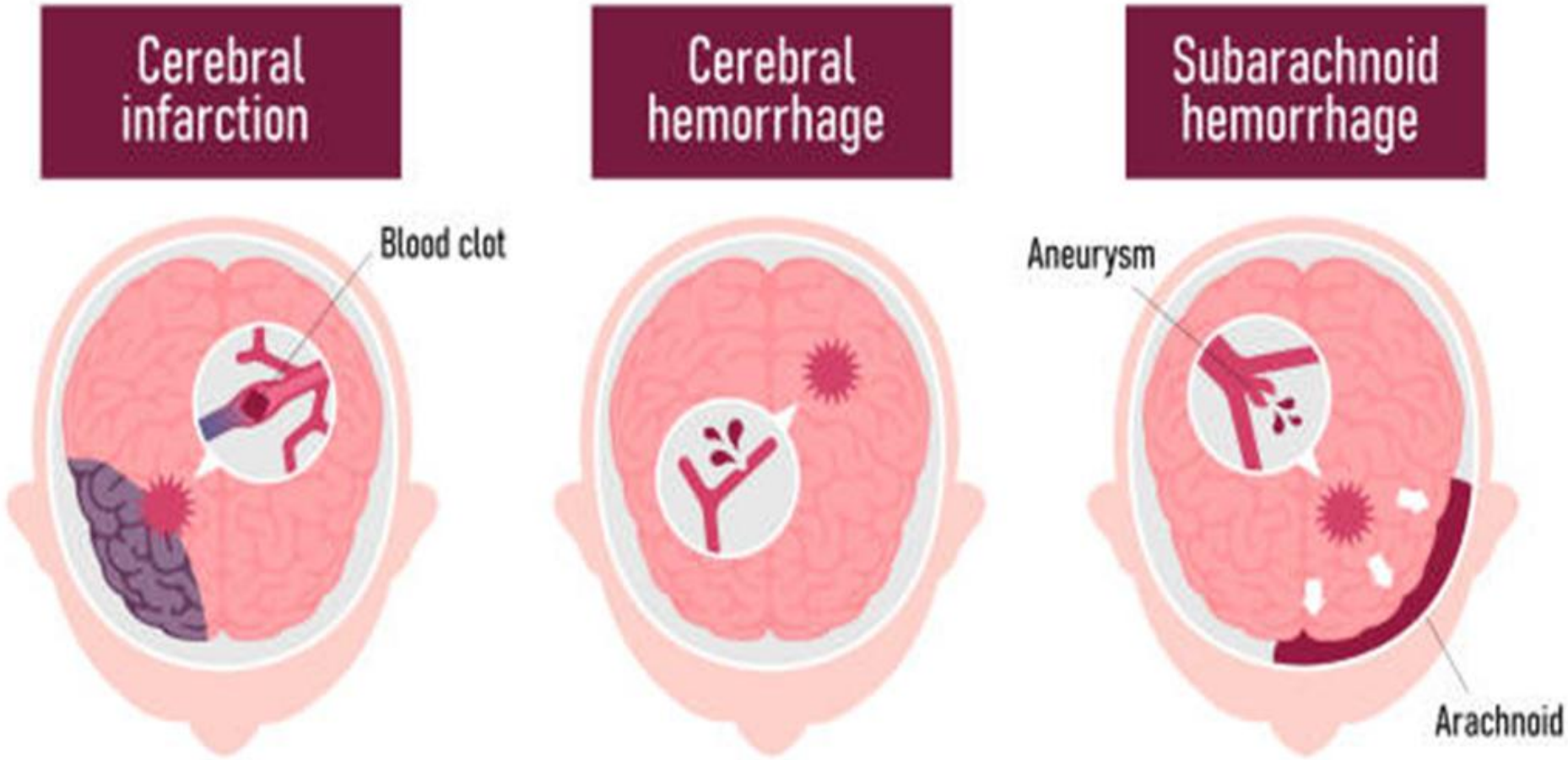


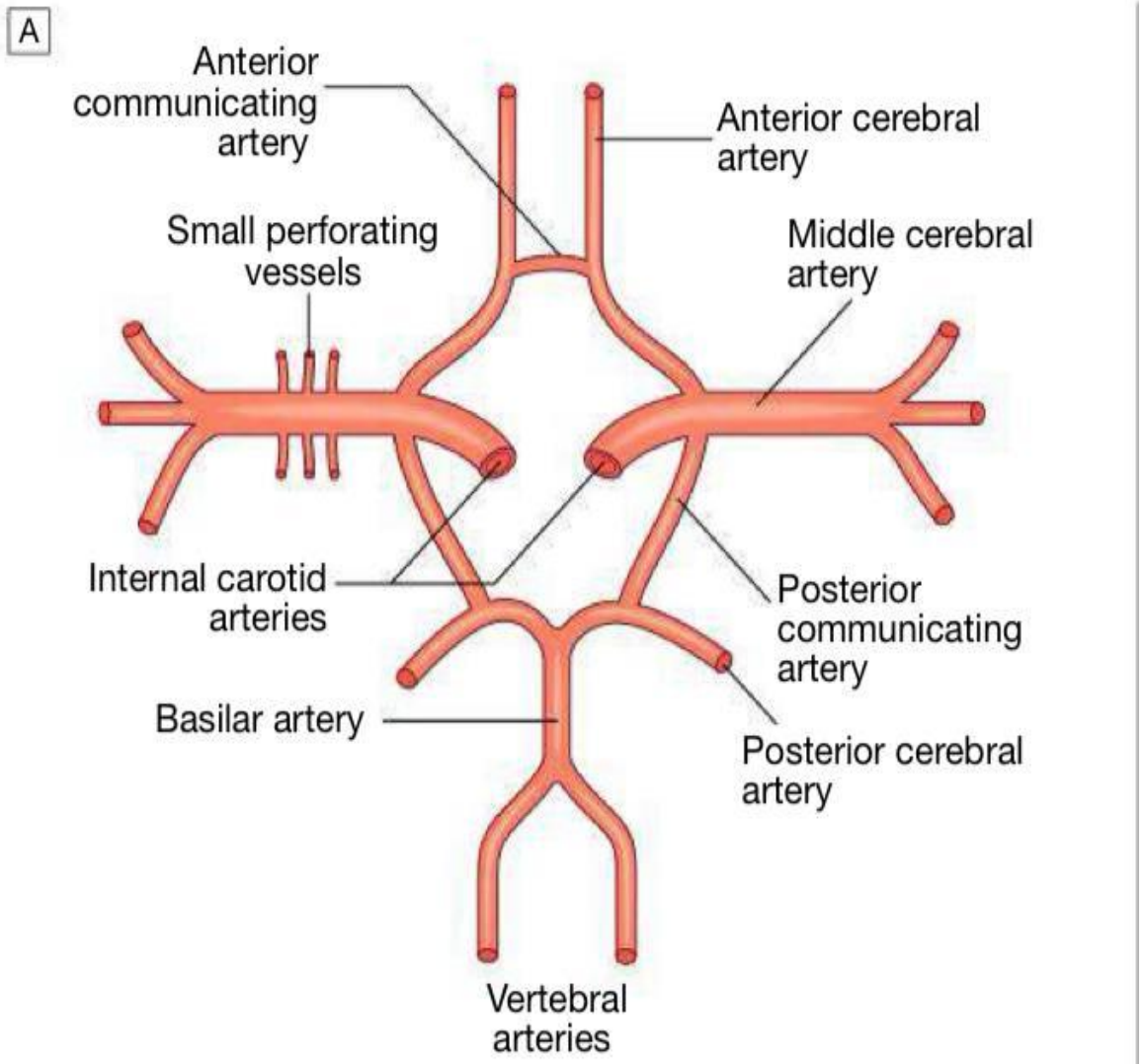
A clot blocks blood flow to an area of the brain.

Hemorrhagic stroke

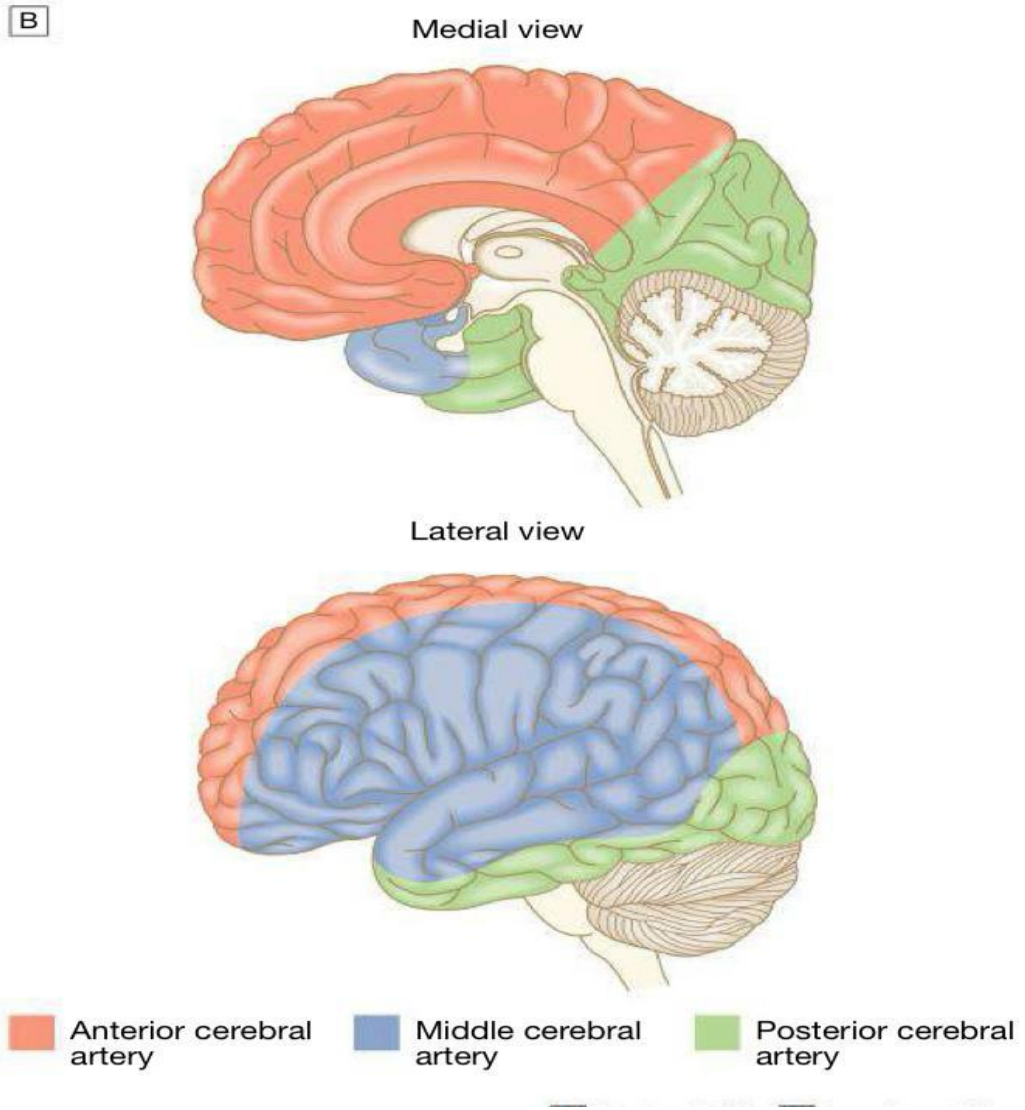


Bleeding occurs inside or around brain tissue.


Cerebral infarction
Blood clot
Cerebral hemorrhage
Subarachnoid hemorrhage
Aneurysm
Arachnoid



Circle of willis



Arterial circulation of the Brain

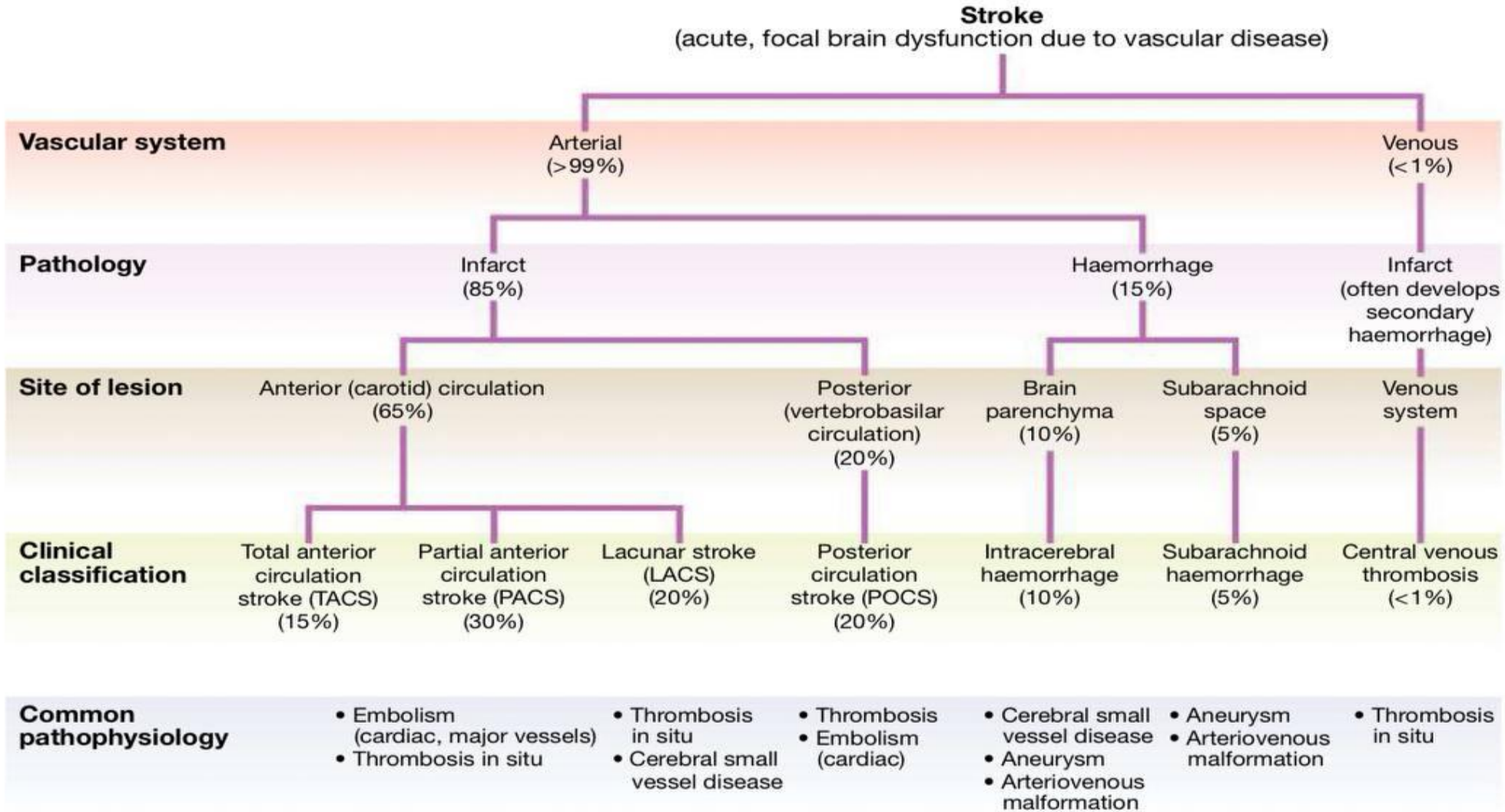
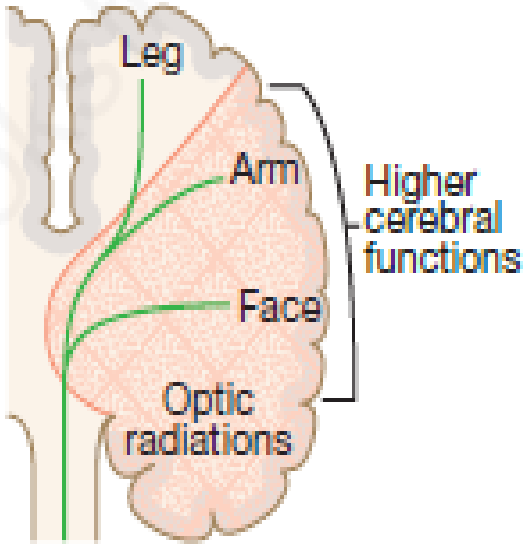
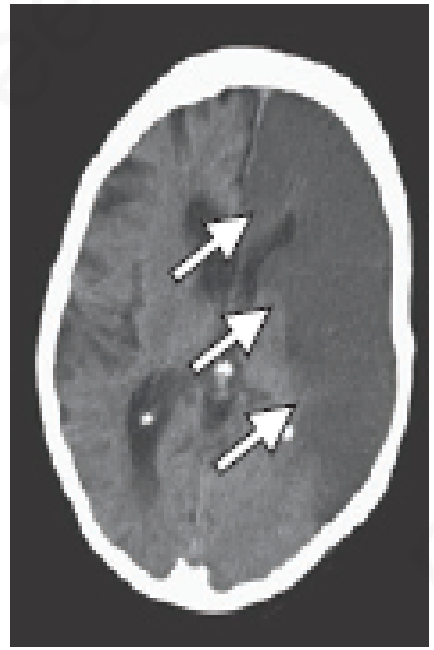
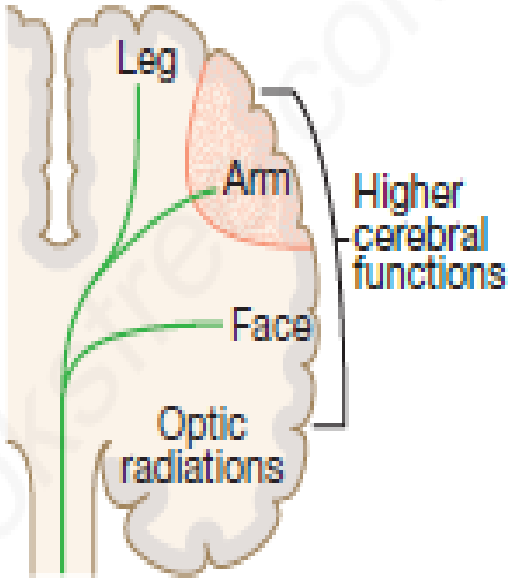
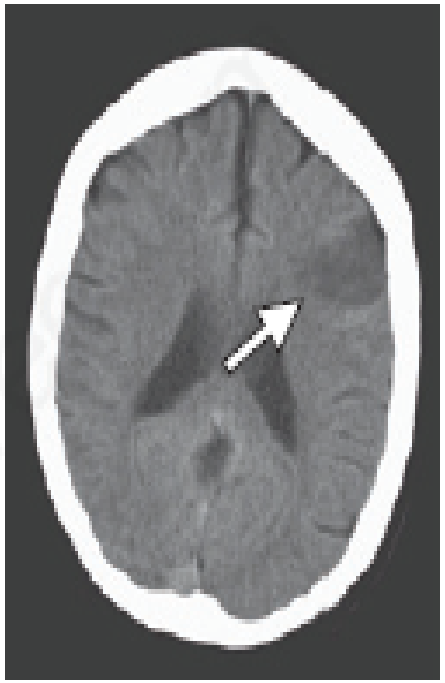
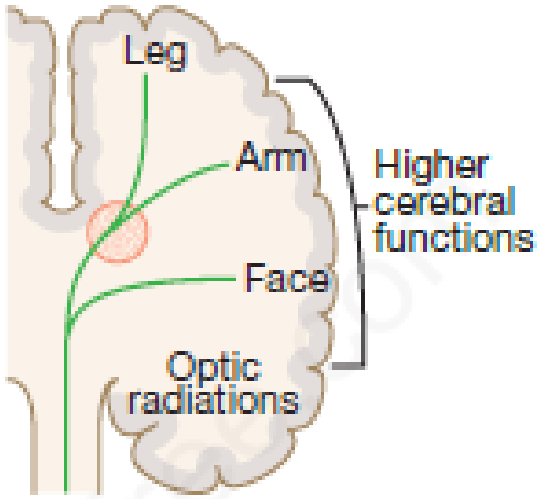


Fig. 29.1 A classification of stroke.

Clinical syndrome	Common symptoms	Common cause	CT scan features
Total anterior circulation syndrome (TACS) 	Combination of: Hemiparesis Higher cerebral dysfunction (e.g. aphasia) Hemisensory loss Homonymous hemianopia (damage to optic radiations)	Middle cerebral artery occlusion (Embolism from heart or major vessels)	

Partial anterior circulation syndrome (PACS) 	Isolated motor loss (e.g. leg only, arm only, face) Isolated higher cerebral dysfunction (e.g. aphasia, neglect) Mixture of higher cerebral dysfunction and motor loss (e.g. aphasia with right hemiparesis)	Occlusion of a branch of the middle cerebral artery or anterior cerebral artery (Embolism from heart or major vessels)	

Lacunar syndrome (LACS)



Pure motor stroke – affects two limbs

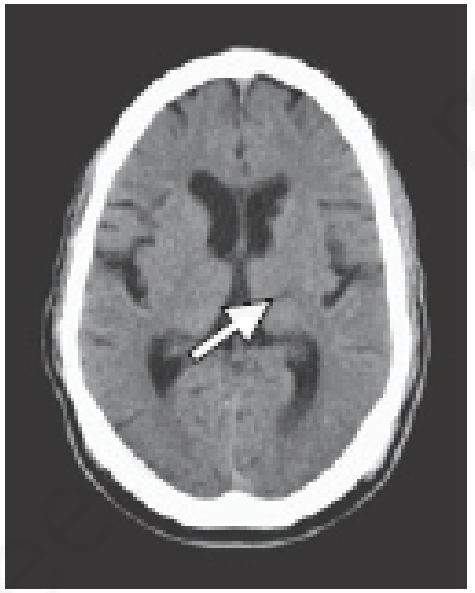
Pure sensory stroke

Sensory-motor stroke

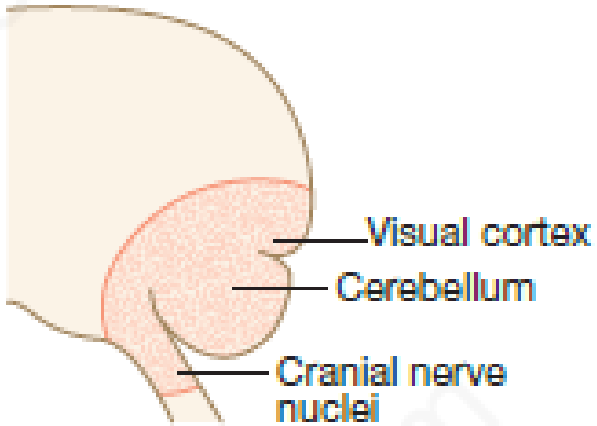
No higher cerebral dysfunction or hemianopia

Thrombotic occlusion of small perforating arteries

(Thrombosis in situ)



Posterior circulation stroke (POCS) (lateral view)



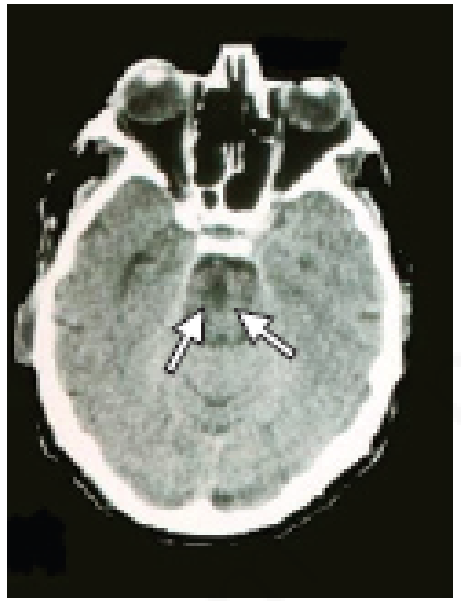
Homonymous hemianopia (damage to visual cortex)

Cerebellar syndrome

Cranial nerve syndromes

Occlusion in vertebral, basilar or posterior cerebral artery territory

(Cardiac embolism or thrombosis in situ)



Neuroimaging

- **Computed tomography (CT) scanning** is the mainstay of emergency stroke imaging. It allows the rapid identification of intracerebral bleeding and stroke ‘mimics’ (i.e. pathologies other than stroke that have similar presentations), such as tumors.
- **Magnetic resonance imaging (MRI)** scanning times are longer than CT, but MRI diffusion weighted imaging (DWI) can detect ischemia earlier than CT.

  it is more sensitive than CT in detecting strokes affecting the brainstem and cerebellum. Contraindications to MRI include cardiac pacemakers and claustrophobia on entering the scanner.
- **CT angiography (CTA) and CT perfusion** are now being used to characterize the cerebral circulation and areas of ischemia better .

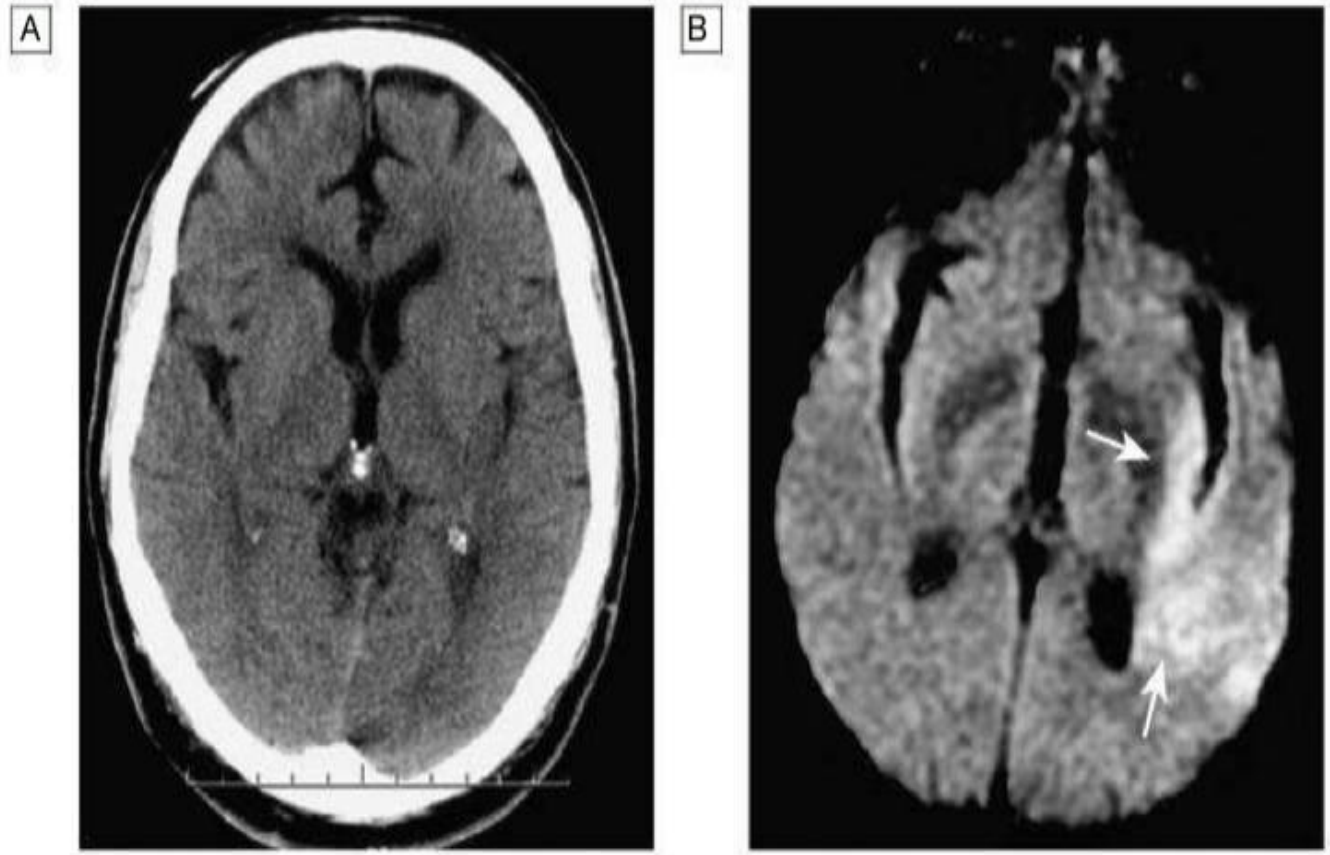


Fig. 29.4 Acute stroke seen on computed tomography (CT) scan with corresponding magnetic resonance imaging (MRI) appearance. A CT may show no evidence of early infarction. B A corresponding image seen on MRI diffusion weighted imaging (DWI) with changes of infarction in the middle cerebral artery (MCA) territory (arrows). *(A, B) Courtesy of Prof. A. Farrell and Prof. J. Wardlaw.*

Vascular imaging

Various techniques are used to obtain images of extracranial and intracranial blood vessels .

The least invasive is **ultrasound (Doppler or duplex scanning)**, which is used to image the carotid and the vertebral arteries in the neck.

Can provided the degree of arterial stenosis and the presence of ulcerated plaques.

Blood flow in the intracerebral vessels can be examined using **transcranial Doppler.**

Blood flow can also be detected by **specialised sequences in MR angiography (MRA)** or CTA but the anatomical resolution is still not as good as that of intra-arterial angiography, which outlines blood vessels by the injection of radio-opaque contrast intravenously or intra-arterially.

Because of the significant risk of complications, intra-arterial contrast angiography is reserved for use when non-invasive methods have provided incomplete information, or when it is necessary to image the intracranial circulation in detail, e.g. to delineate a saccular aneurysm, an arteriovenous malformation or vasculitis.

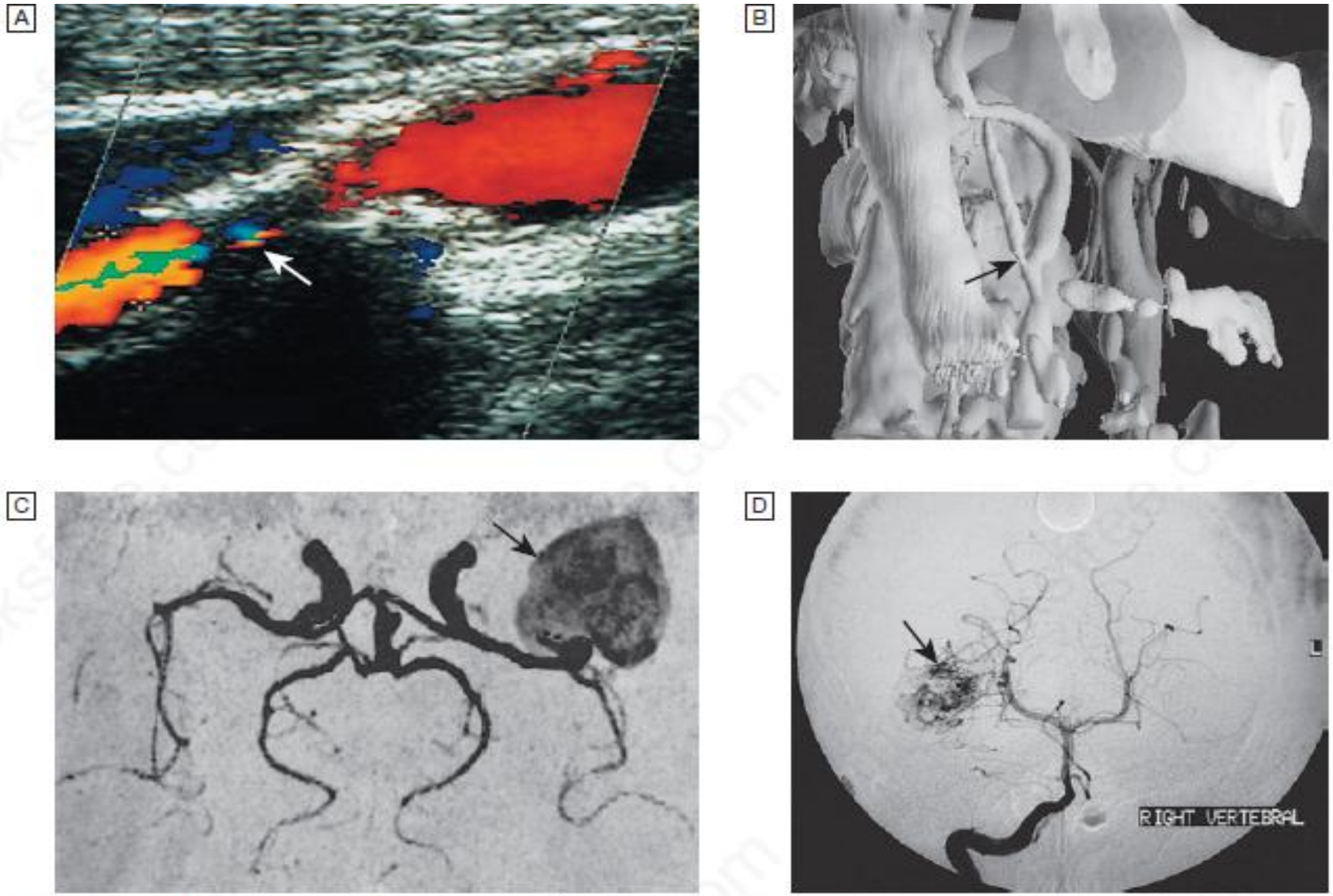


Fig. 26.5 Different techniques for imaging blood vessels. A Doppler scan showing 80% stenosis of the internal carotid artery (arrow). B Three-dimensional reconstruction of CT angiogram showing stenosis at the carotid bifurcation (arrow). C MR angiogram showing giant aneurysm at the middle cerebral artery bifurcation (arrow). D Intra-arterial angiography showing arteriovenous malformation (arrow). *A–D, Courtesy of Dr D. Collie.*

29.5 Investigation of a patient with an acute stroke: all of these are not necessary in all patients, and should be targeted depending on clinical syndrome and suitability for intervention

Diagnostic question	Investigation
Is it a vascular lesion?	Brain imaging
Is it ischaemic or haemorrhagic?	Brain imaging
Is it a subarachnoid haemorrhage?	CT/lumbar puncture
Is there any cardiac source of embolism?	ECG Prolonged ECG monitoring Echocardiogram
What is the underlying vascular disease, where intervention is indicated?	Ultrasound of carotids with Doppler MRA CTA Contrast angiography
What are the risk factors for stroke?	Full blood count Cholesterol Blood glucose Blood pressure
Is there an unusual cause?	ESR Serum protein electrophoresis Clotting/thrombophilia screen HIV/syphilis serology

(CT = computed tomography; CTA = computed tomographic angiography; ECG = electrocardiogram; ESR = erythrocyte sedimentation rate; MRA = magnetic resonance angiography; MRI = magnetic resonance imaging)

29.7 Indications for immediate brain imaging in acute stroke

- Patient on anticoagulants or with abnormal coagulation
- Suitable for reperfusion (thrombolysis)
- Deteriorating conscious level or rapidly progressing deficits
- Suspected cerebellar haematoma, to exclude hydrocephalus

Management

Stroke unit

- Ideally, people who have had a stroke are admitted to a "stroke unit", a ward or dedicated area in a hospital staffed by nurses and therapists with experience in stroke treatment.
- Nursing care is fundamental in maintaining skin care, feeding, hydration, positioning, and monitoring vital signs such as temperature, pulse, and blood pressure.

Rehabilitation

- Stroke rehabilitation is the process by which those with disabling strokes undergo treatment to help them return to normal life as much as possible by regaining and relearning the skills of everyday living

Medication

Antiplatelet and statin in ischemic stroke, antibiotics in case of infection, treatment of the underlying cause with control of DM,HT.


THANKS FOR
LISTENING