



Neuroanatomy of a Stroke

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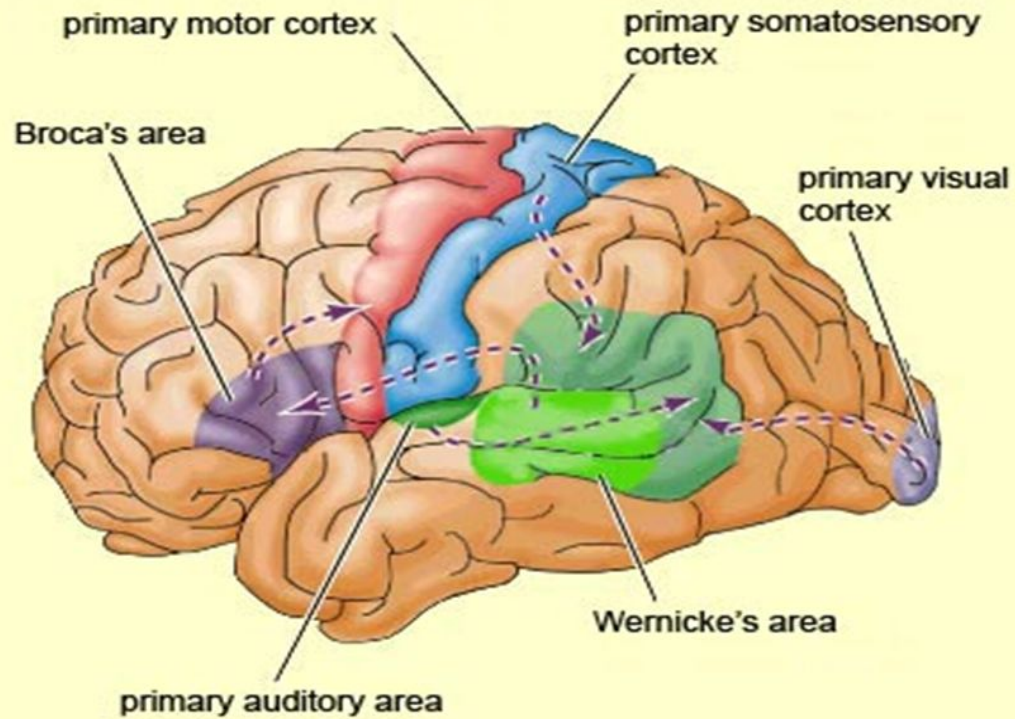
Barrow Neurologic Institute

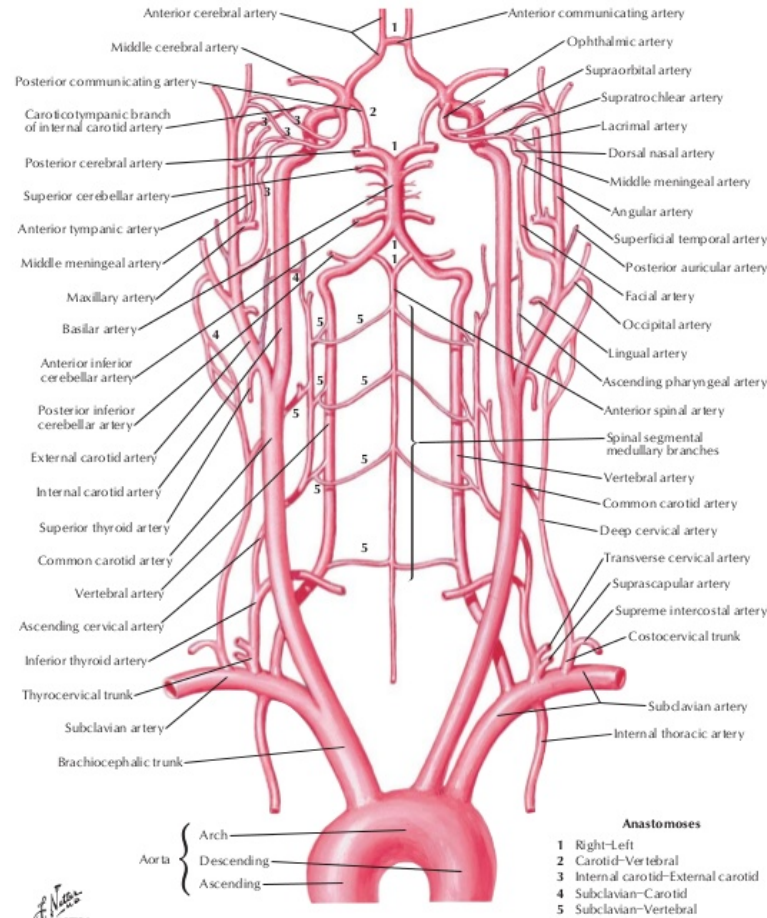
- No disclosures

- Stroke case presentations
 - Review signs and symptoms
 - Review pertinent exam findings
 - Identify the neuroanatomy of the stroke
 - Identify the vascular territory
 - Discuss likely etiology








Case 1

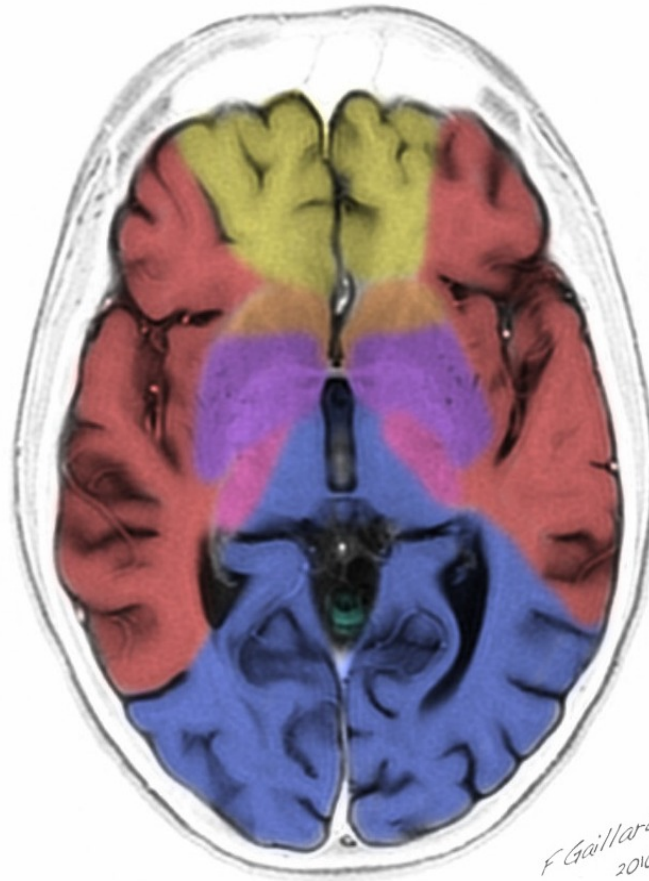
- 75 yr old female presents to the ER with trouble speaking and rt face, arm and leg weakness
- Exam
 - BP= 160/90 HR= 90 irregularly irregular
 - Expressive aphasia
 - Left gaze preference
 - Right homonymous hemianopia
 - Right hemiparesis/hemianesthesia





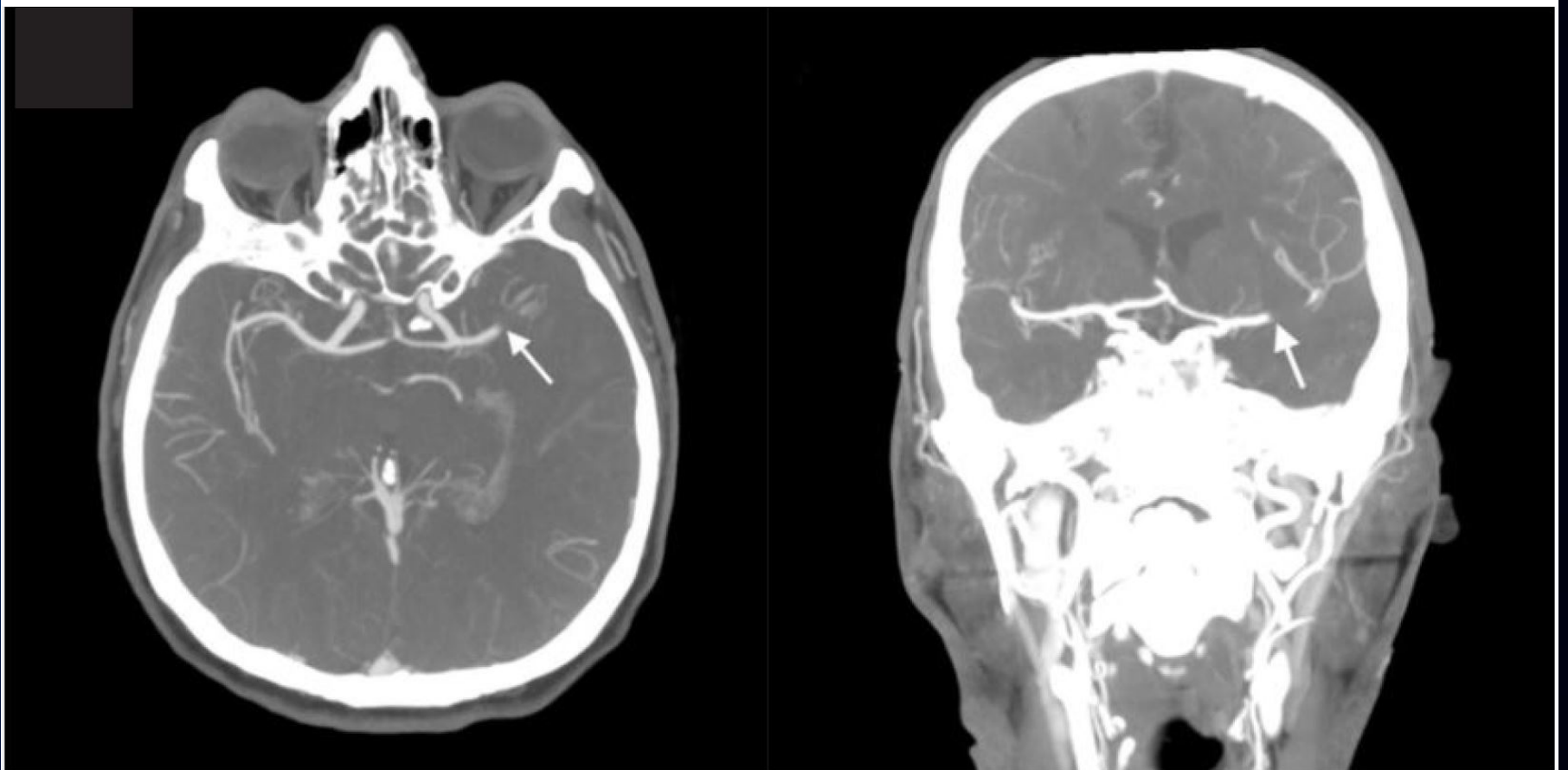
Cerebral Vascular Territories

-  Anterior cerebral artery (ACA)
-  Medial lenticulostrate arteries
-  Anterior choroidal artery
-  Middle cerebral artery (MCA)
-  Lateral lenticulostrate arteries
-  Posterior cerebral artery (PCA)
-  Superior cerebellar artery (SCA)



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Left MCA Occlusion

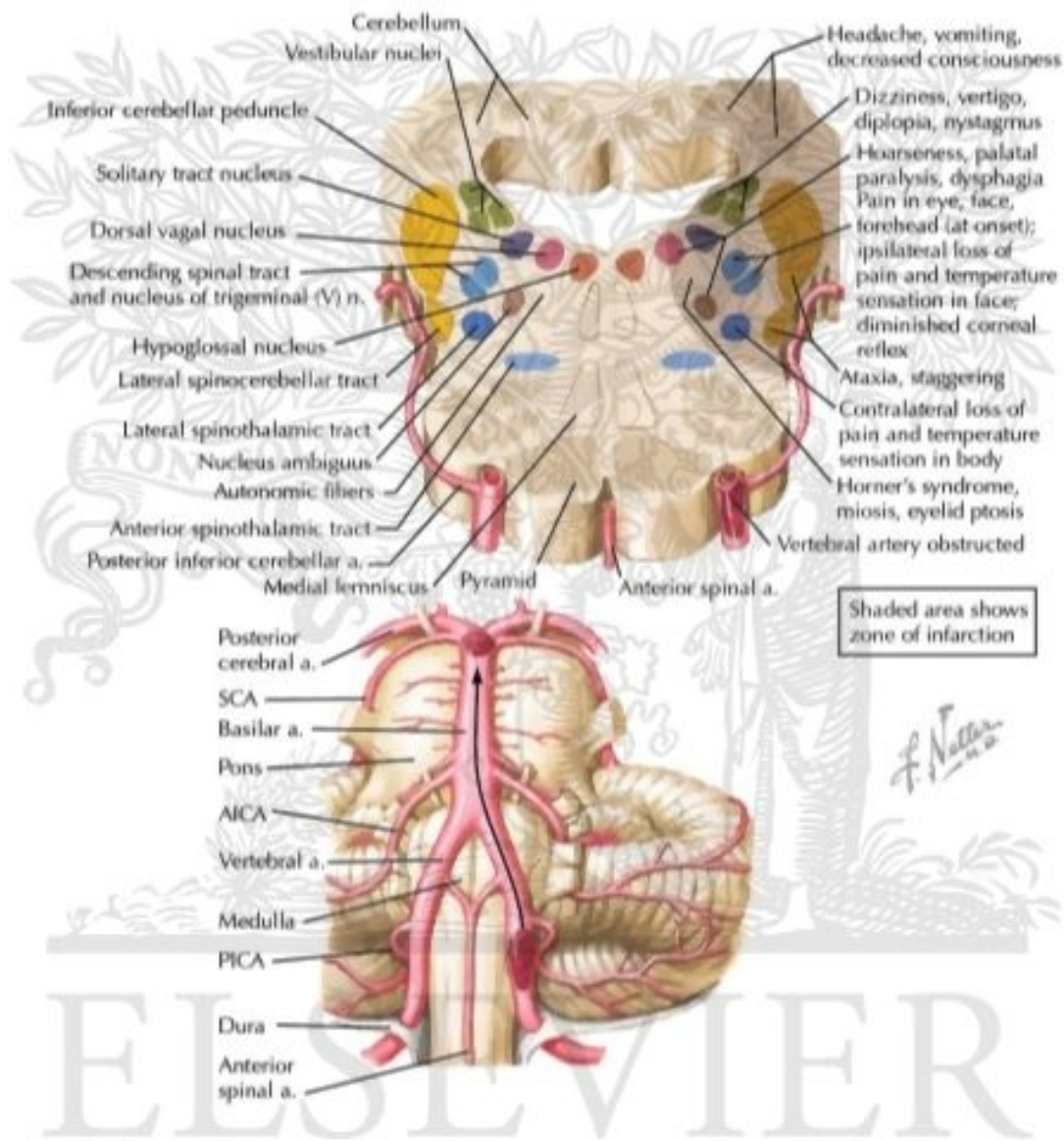


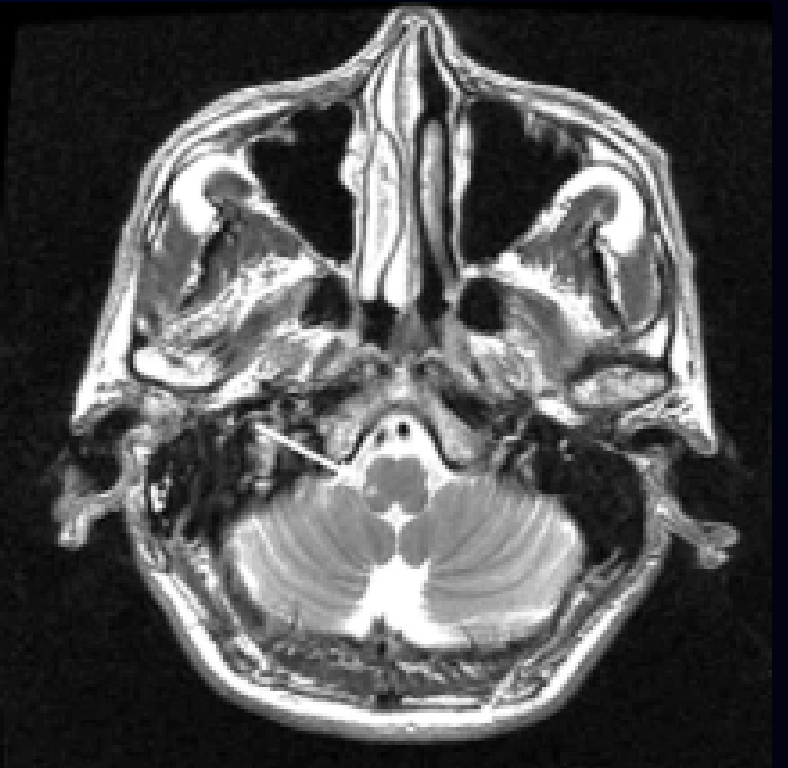
Etiology

- Embolic stroke
- EKG: atrial fibrillation
- Likely etiology is cardiac embolus secondary to atrial fibrillation
- Treatment: long term anticoagulation

Case 2

- 70 yr old male with a history of HTN and DM presents with the following symptoms:
 - Vertigo
 - Veers to rt on walking
 - Nausea and vomiting
 - Numbness rt cheek





Lateral Medullary Syndrome

- Symptoms
 - Ataxia
 - Numbness
 - Dysphagia
 - Vertigo
 - Nausea/Vomiting
 - Dysarthria
 - Diplopia or blurred vision
 - Hoarseness
 - Facial Pain
 - Hiccups

Lateral Medullary Syndrome

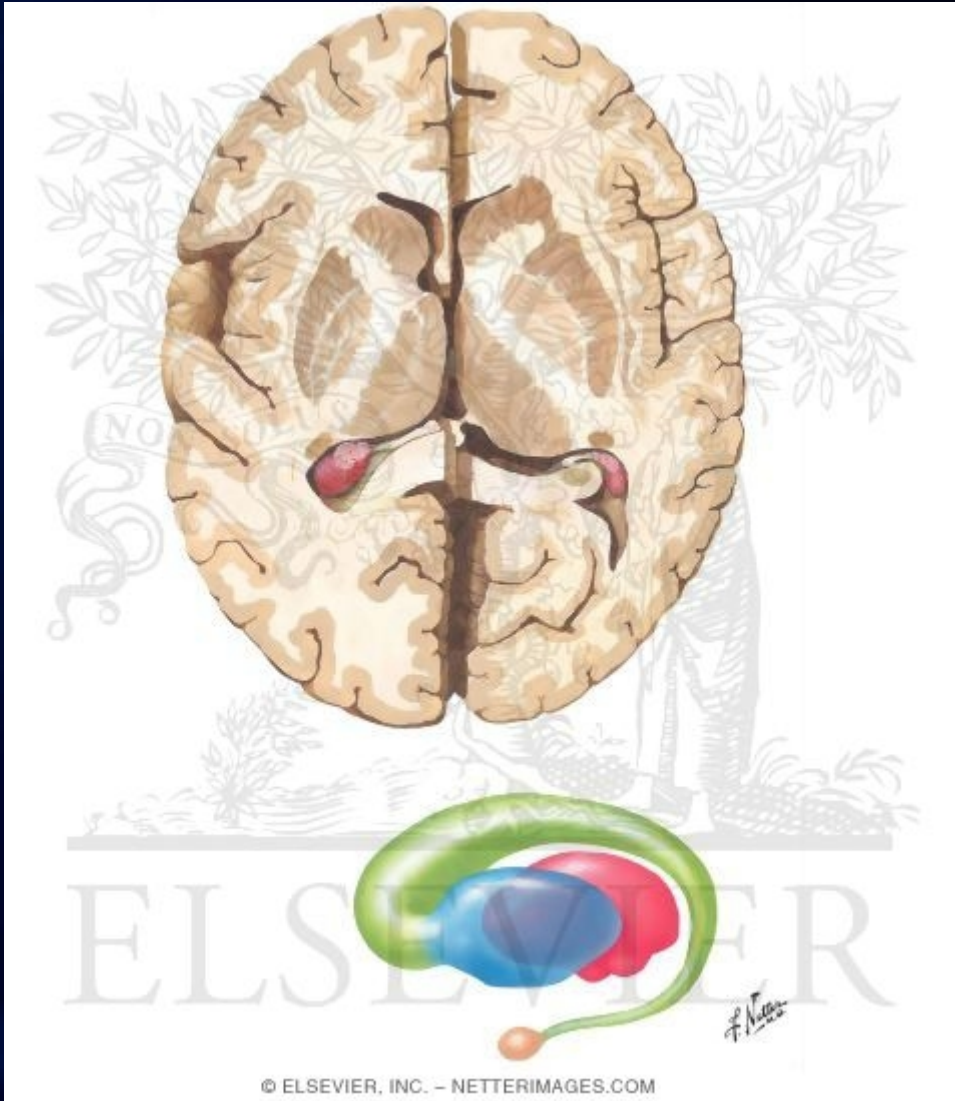
- Neurologic Findings
 - Pain and temperature hypesthesia (contralateral limbs)
 - Horner's syndrome (sympathetic tract)
 - Gait and limb ataxia
 - Facial hypesthesia (ipsilateral)
 - Nystagmus
 - Pharyngeal and vocal cord paralysis

Etiology

- Most frequent arterial lesion is occlusion of the vertebral artery
 - $\frac{3}{4}$ are thrombotic and remainder cardioembolic
 - Rarely is the lesion confined only to the PICA
 - In young patients with headache vertebral artery dissection may be the cause

Case 3

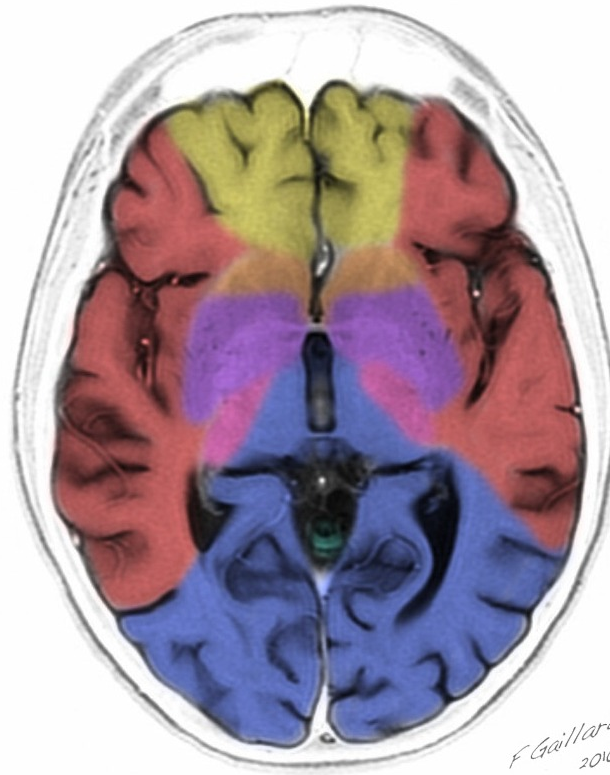
- 85 yr old male with HTN presents with face, arm and leg weakness;
- Exam significant for rt facial weakness and 0/5 strength in the rt arm and leg



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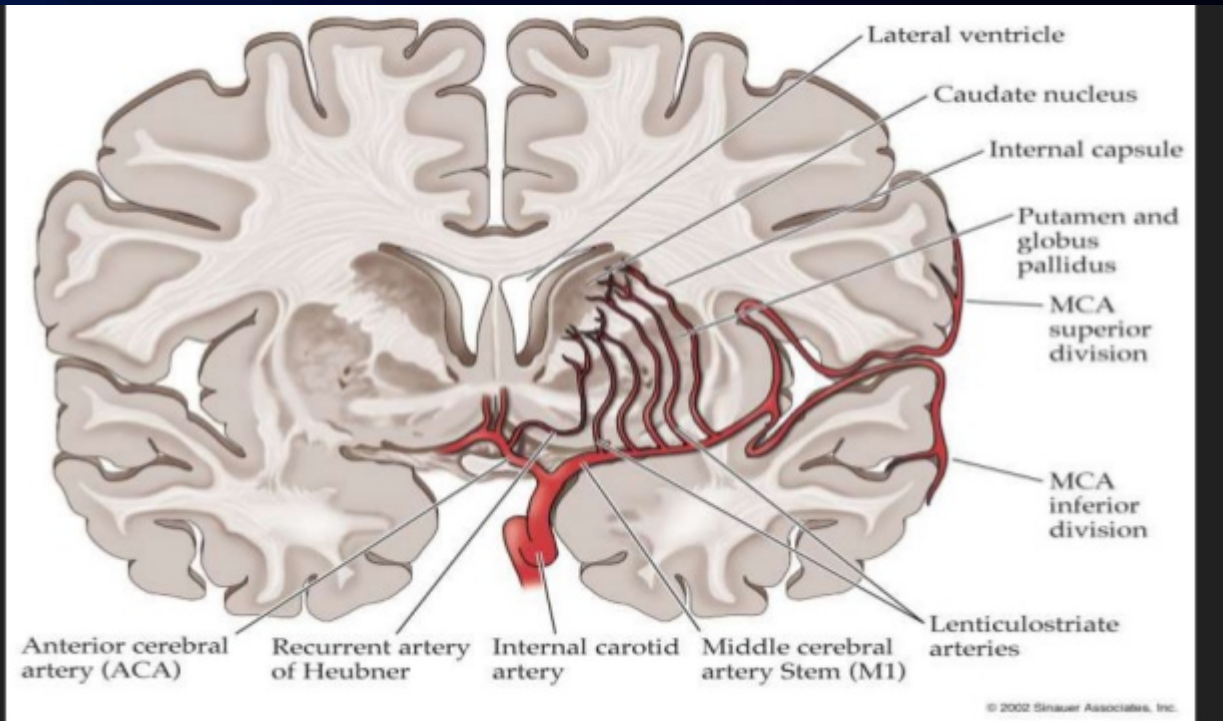
Cerebral Vascular Territories

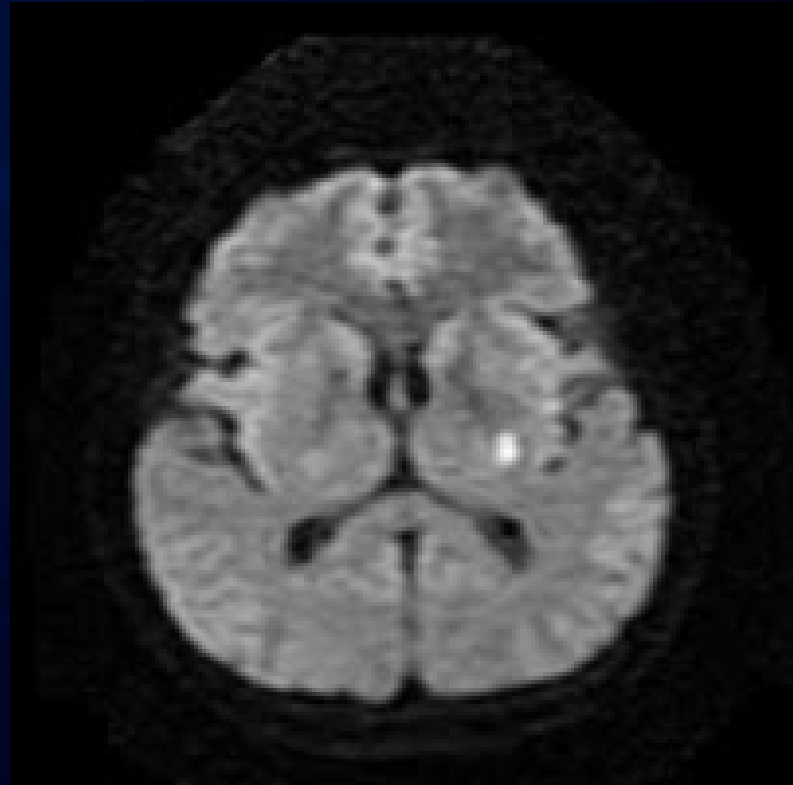
- Anterior cerebral artery (ACA)
- Medial lenticulostriate arteries
- Anterior choroidal artery
- Middle cerebral artery (MCA)
- Lateral lenticulostriate arteries
- Posterior cerebral artery (PCA)
- Superior cerebellar artery (SCA)

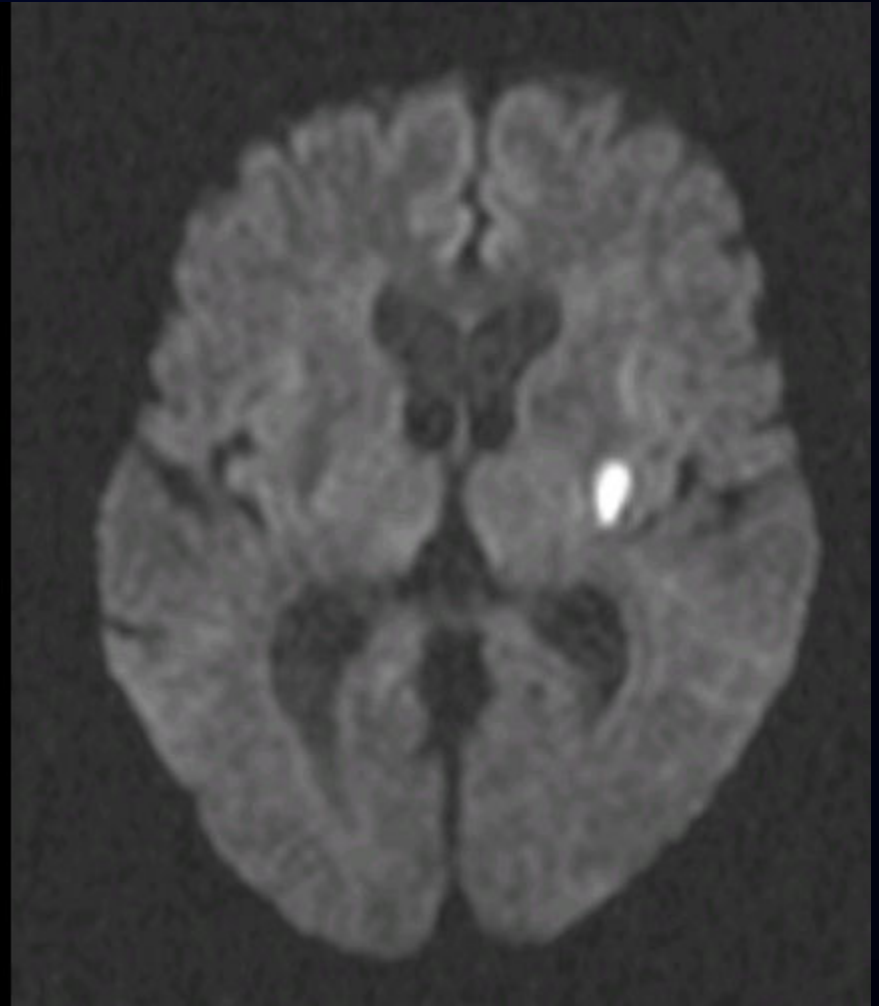
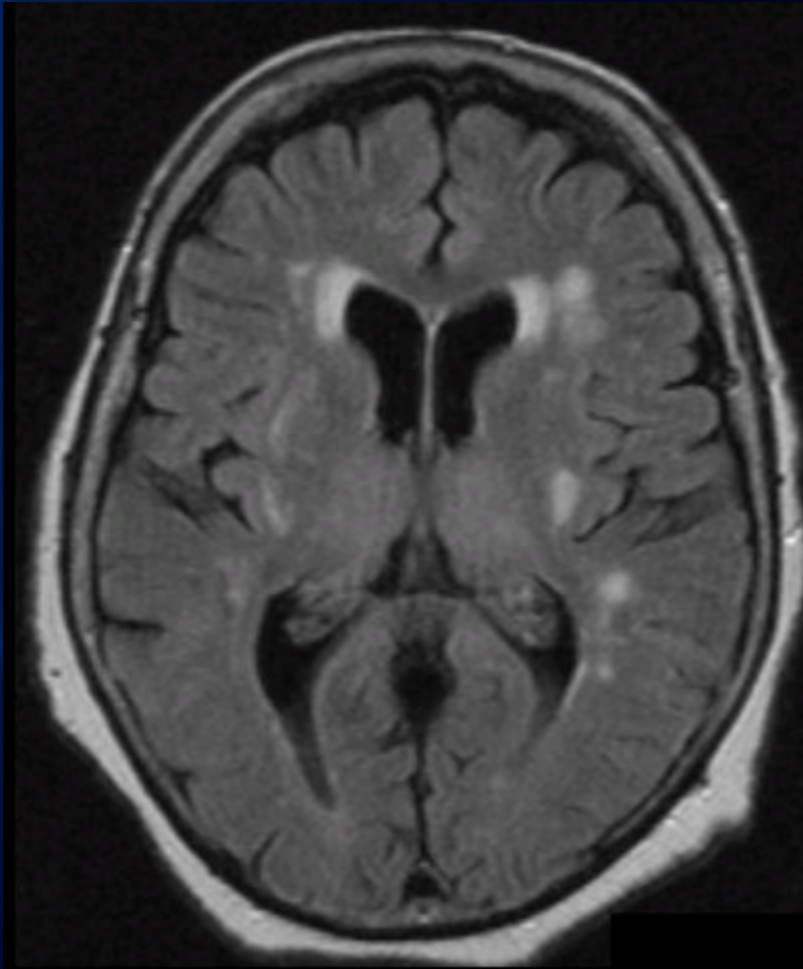


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Lacunar Strokes

- Infarct caused by the occlusion of a single penetrating artery
- Lacunar infarcts are less than 15 mm in diameter

Clinical Lacunar Syndromes

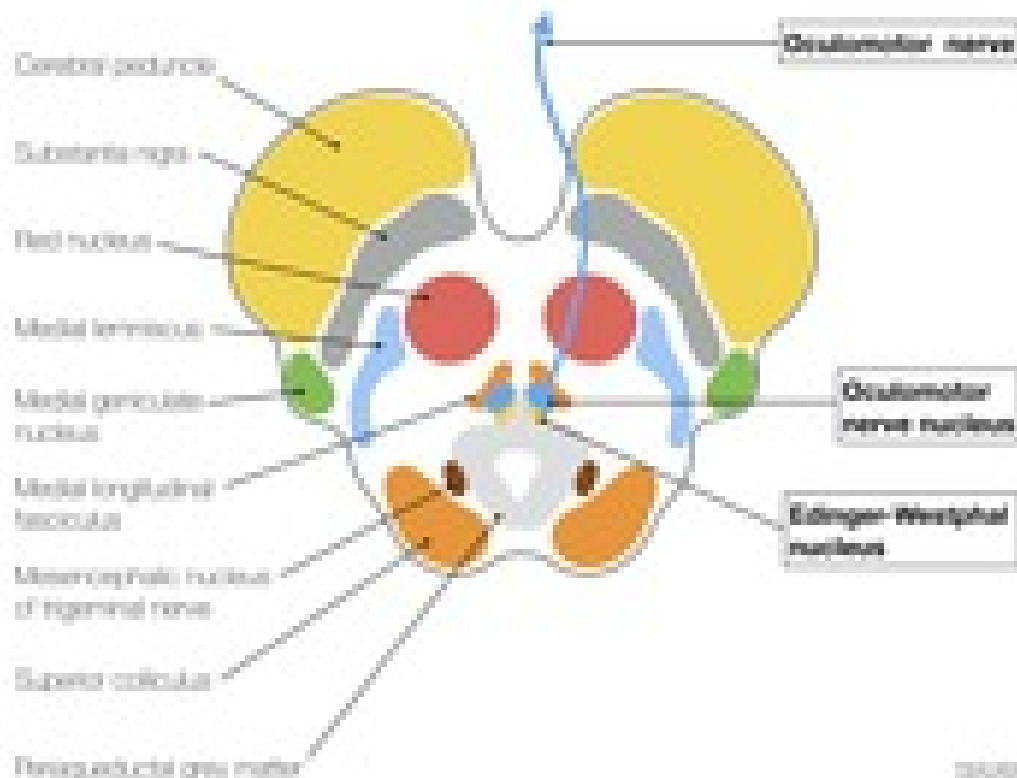
- Pure Motor Hemiparesis
- Pure Sensory Hemiparesis
- Mixed motor/sensory
- Dysarthria clumsy hand syndrome
- Ataxic Hemiparesis

Case 4

- 70 yr old male with DM presents with complaints of double vision and weakness on the rt face, arm and leg
- Exam shows left third nerve palsy and rt face, arm and leg weakness

Oculomotor nerve

CN III



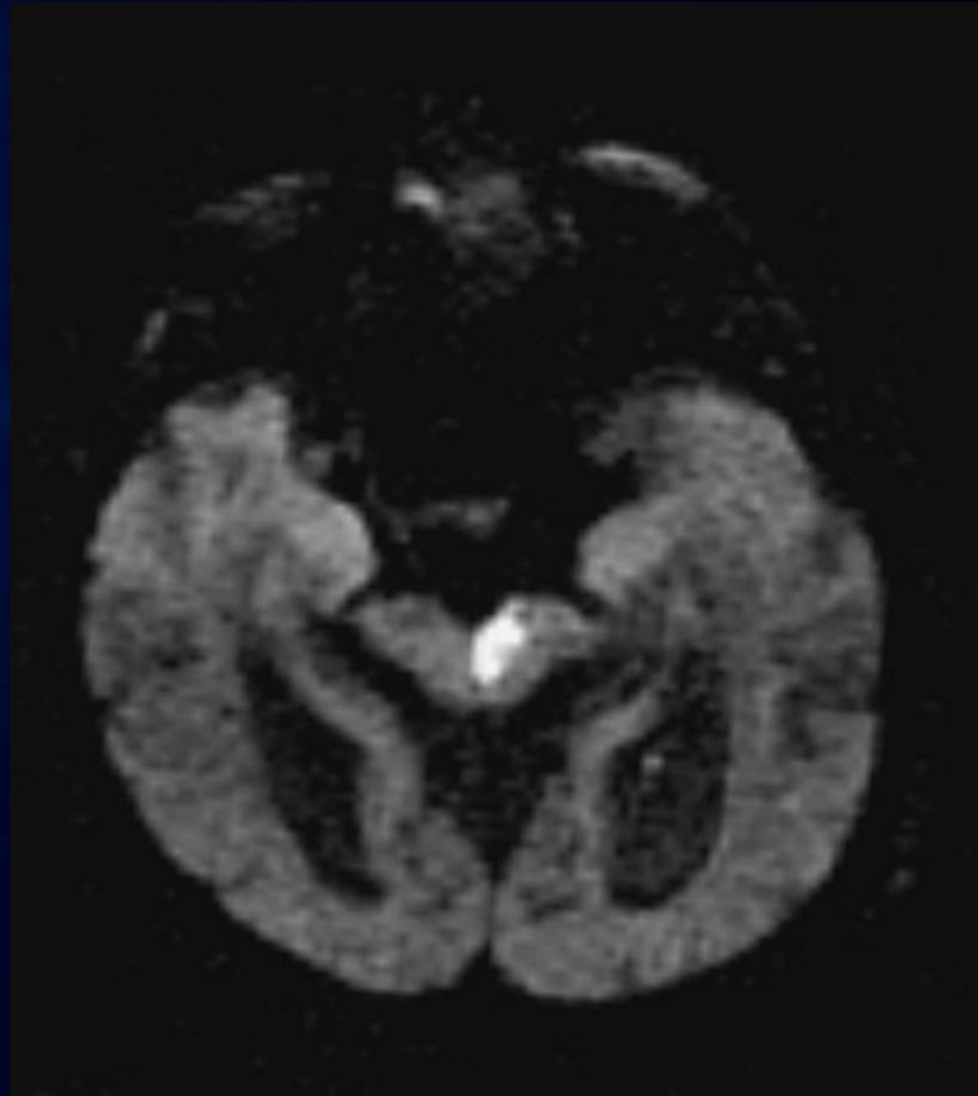
Oculomotor Nerve

- Clinical signs of CN III injury are:
 - Ptosis (drooping upper eyelid) –due to paralysis of the levator palpebrae superioris
 - Eyeball resting in the down and out position – due to the paralysis of the superior, inferior and medial rectus and the inferior oblique. The patient is unable to elevate, depress or adduct the eye.
 - Dilated pupil – due to the unopposed action of the dilator pupillae muscle



Weber Syndrome

- Ipsilateral third nerve palsy and crossed hemiplegia
- Likely to be due to occlusion of the posterior cerebral artery at the P1 segment



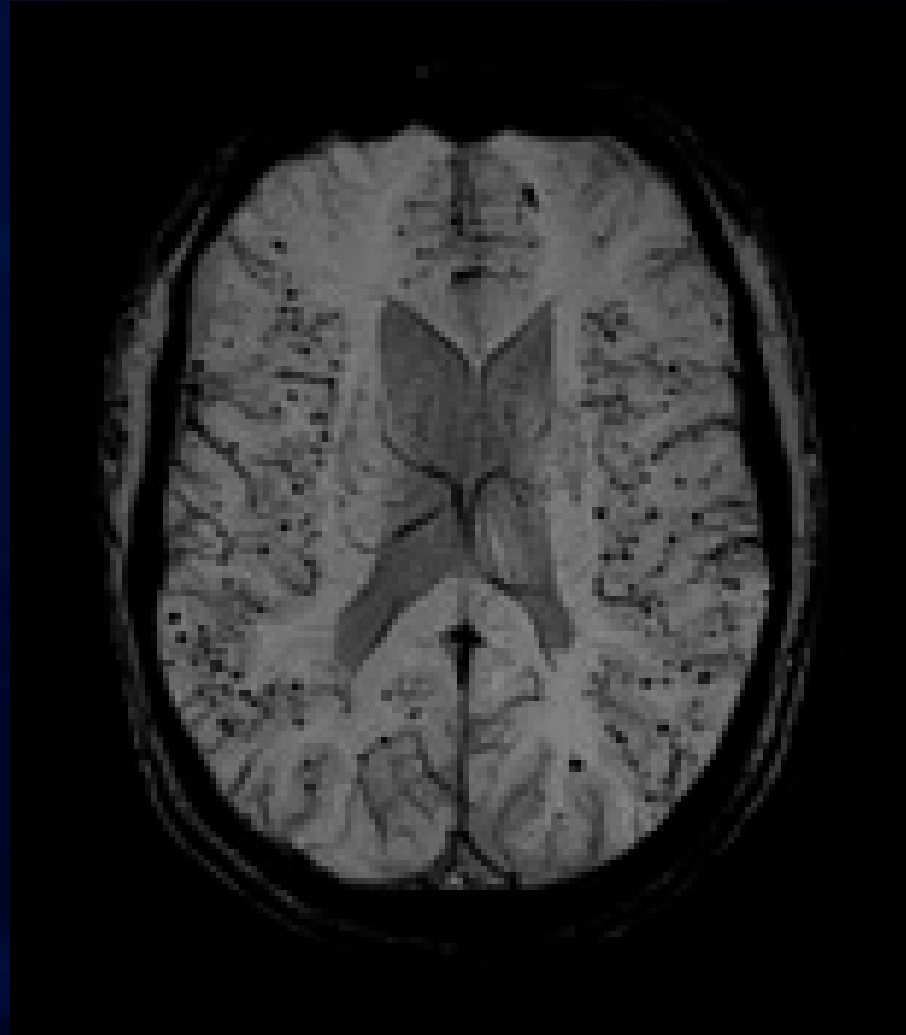
Case courtesy of A.Prof Frank Gaillard,
Radiopaedia.org, rID: 2665

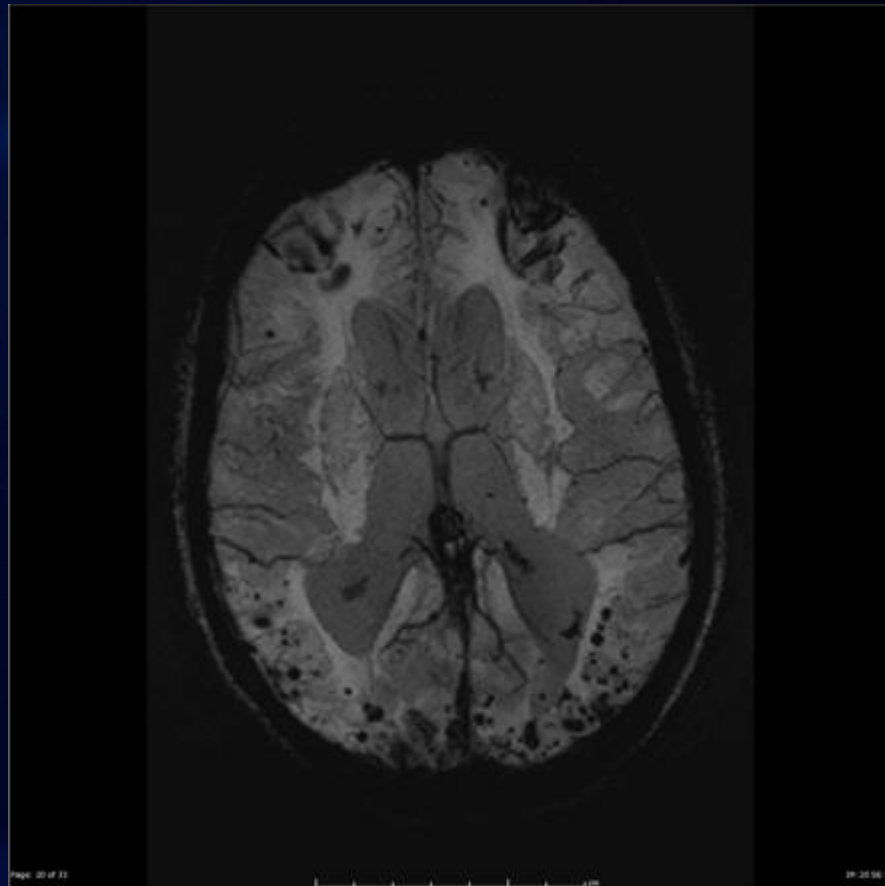
Case 5

- A 78 yr old male began having episodes of rt arm numbness, decreased coordination and weakness lasting 5 min. and self resolved
- He was diagnosed with TIAs and started on aspirin
- Work up was reported as normal
- Spells stopped but had a slowly progressive cognitive decline
- He presented to the ER two years later with several days of increased confusion and walking into walls



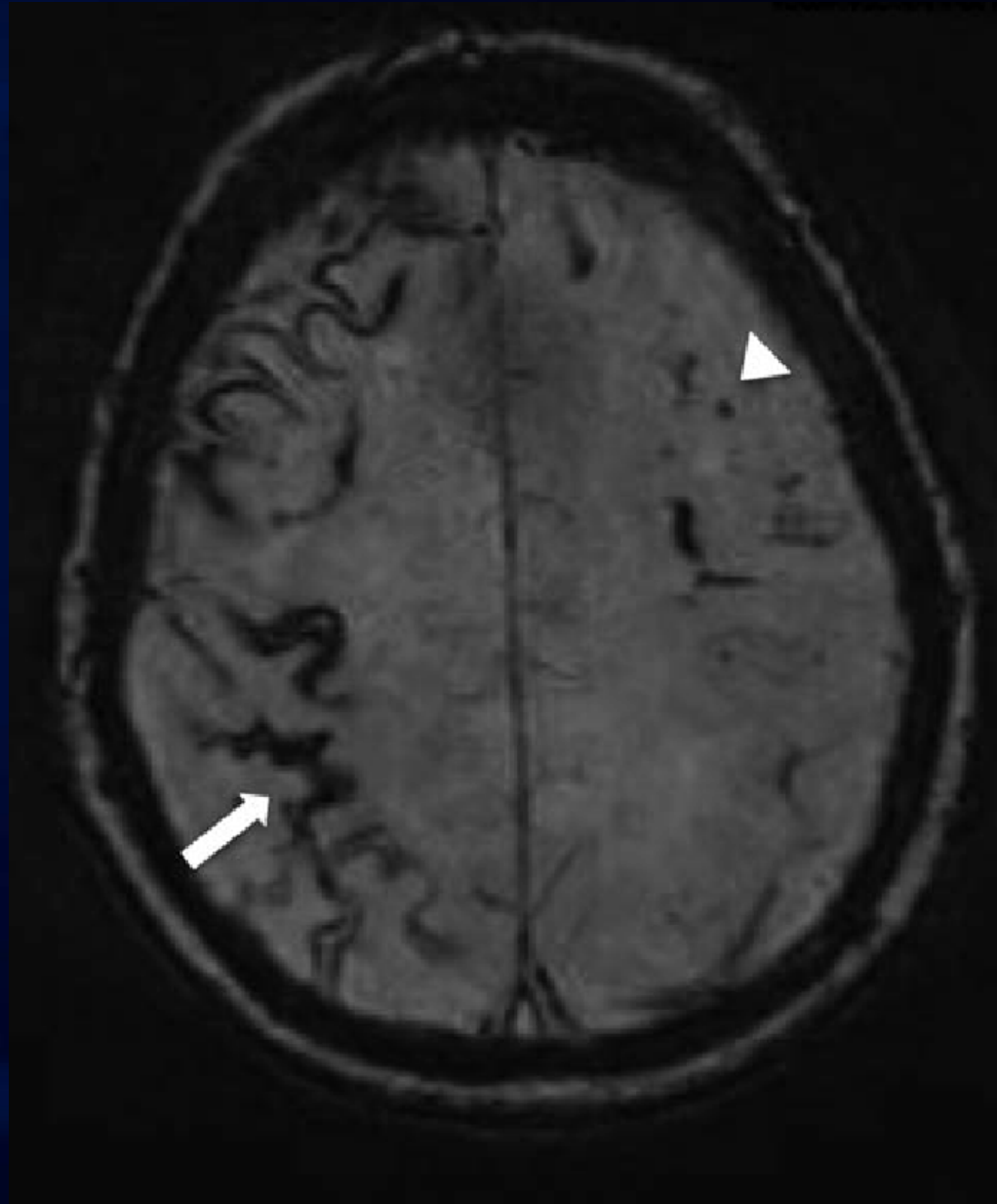
Cerebral Microhemorrhages





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Cerebral Amyloid Angiopathy

- Characterized by amyloid B fibril deposition in the media of small to medium sized vessels
- Risk factor: increased age
- Recurrent hemorrhages : lobar
- Can have superficial siderosis
- Age 55 or older
- Microhemorrhages on MRI GRE images

CAA

- About 20% of patients may have transient focal neurologic spells, “amyloid spells”
- Usually seen in those with superficial siderosis

CAA

- No treatment but avoid anti-platelet agents and anticoagulants.