

Neuroradiology

Lecture 2

Intracranial hemorrhage

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5th stage

Intracranial Haemorrhage

- *Intracranial hemorrhage* is characterized by the extra-vascular accumulation of blood within different intracranial spaces.
- A simple categorization is based on location:
 - intra-axial (inside brain parenchyma)
 - extra-axial (outside brain parenchyma)

Intracranial Haemorrhage

- Simple categorization is based on location:

1. Intra-axial (inside brain parenchyma)

- Intra cerebral
- Intra cerebeller

2. Extra-axial (outside brain parenchyma)

- Extra dural haemorrhage (EDH)
- Sub dural haemorrhage (SDH)
- Sub arachnoid haemorrhage (SAH)
- Intra ventricular.

Causes of ICH

- **Trauma**

- Extra-dural haemorrhage (EDH)
- Sub-dural haemorrhage (SDH)
- Sub-arachnoid haemorrhage (SAH)
- Cerebral hemorrhagic contusion
- Coup & Countre Coup injury

- **Vascular malformation(s)**

- berry aneurysm
- mycotic aneurysm
- arteriovenous malformation (AVM)
- dural arteriovenous fistula (DAVF)

- **Tumour related haemorrhage**

- **Hypertension:** hypertensive haemorrhage

- **Cerebral amyloid angiopathy (CAA) :** micro hemorrhage

- **Cerebral venous thrombosis**

Imaging Modalities

- CT
 - Non contrast brain CT scan
 - CT angiography (CTA)
 - CT venogram (CTV)
- MRI
 - T1, T2, FLAIR, T2*, SWI, DWI
 - MRA (MR arteriography) can be done with & without contrast
 - MRV (MR Venography)
- Angiography

CT

- CT scan is almost always the (1st) imaging modality used to assess patients with suspected intracranial haemorrhage.
- Fortunately acute blood is markedly hyperdense compared to brain parenchyma
- CT angiography (CTA) is increasingly used to assess for a vascular underlying cause, particularly in cases of subarachnoid haemorrhage, or intra-parenchymal haemorrhage
- CT venogram (CTV) can be used to reliably assess for patency of the dural venous sinuses.

MRI

- Excellent tissue characterization.
- The appearance of blood changes depending on the sequence and the time.
- Hematoma aging is made by MRI

Intra axial

* Intra parenchymal *

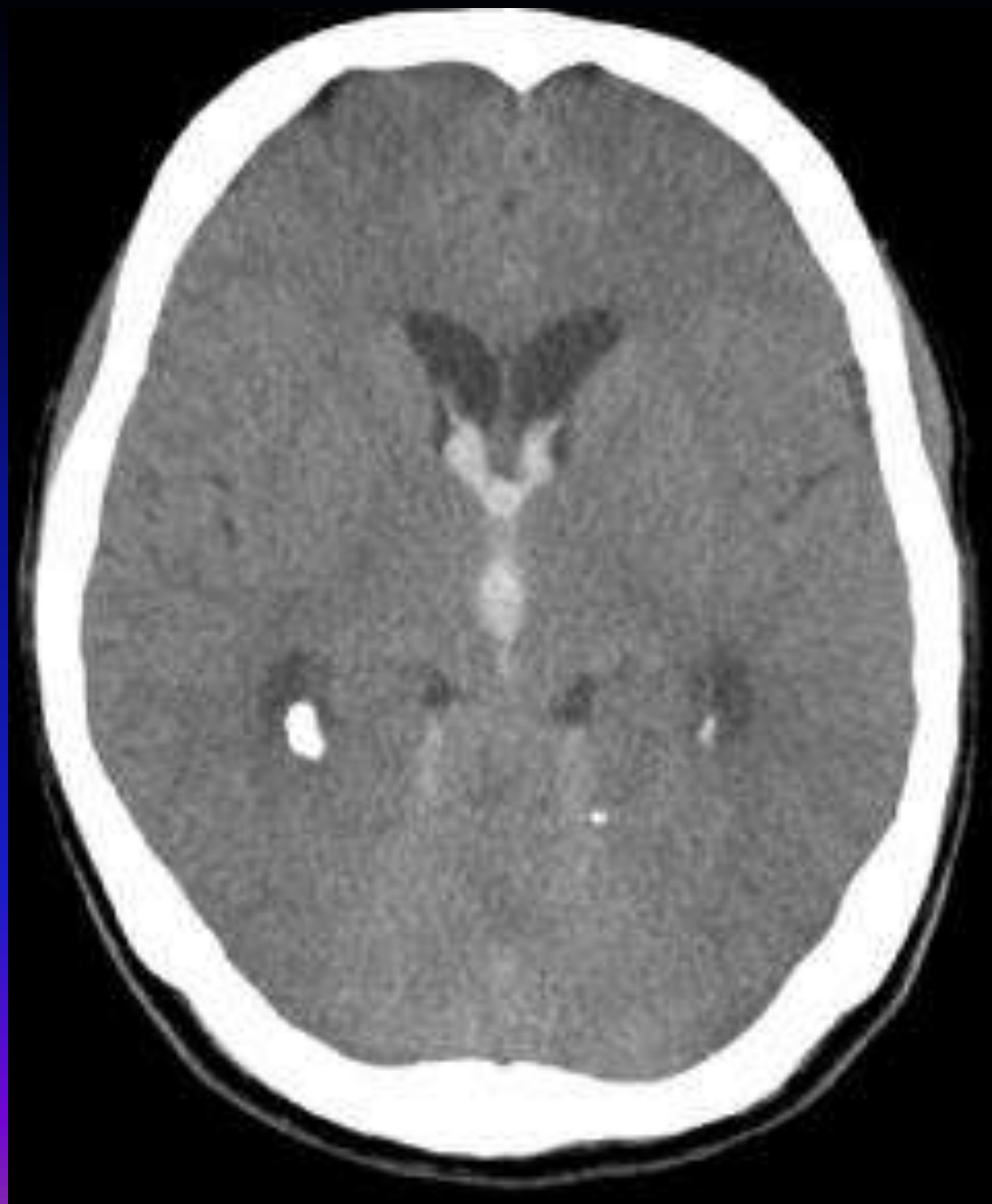
Hematoma



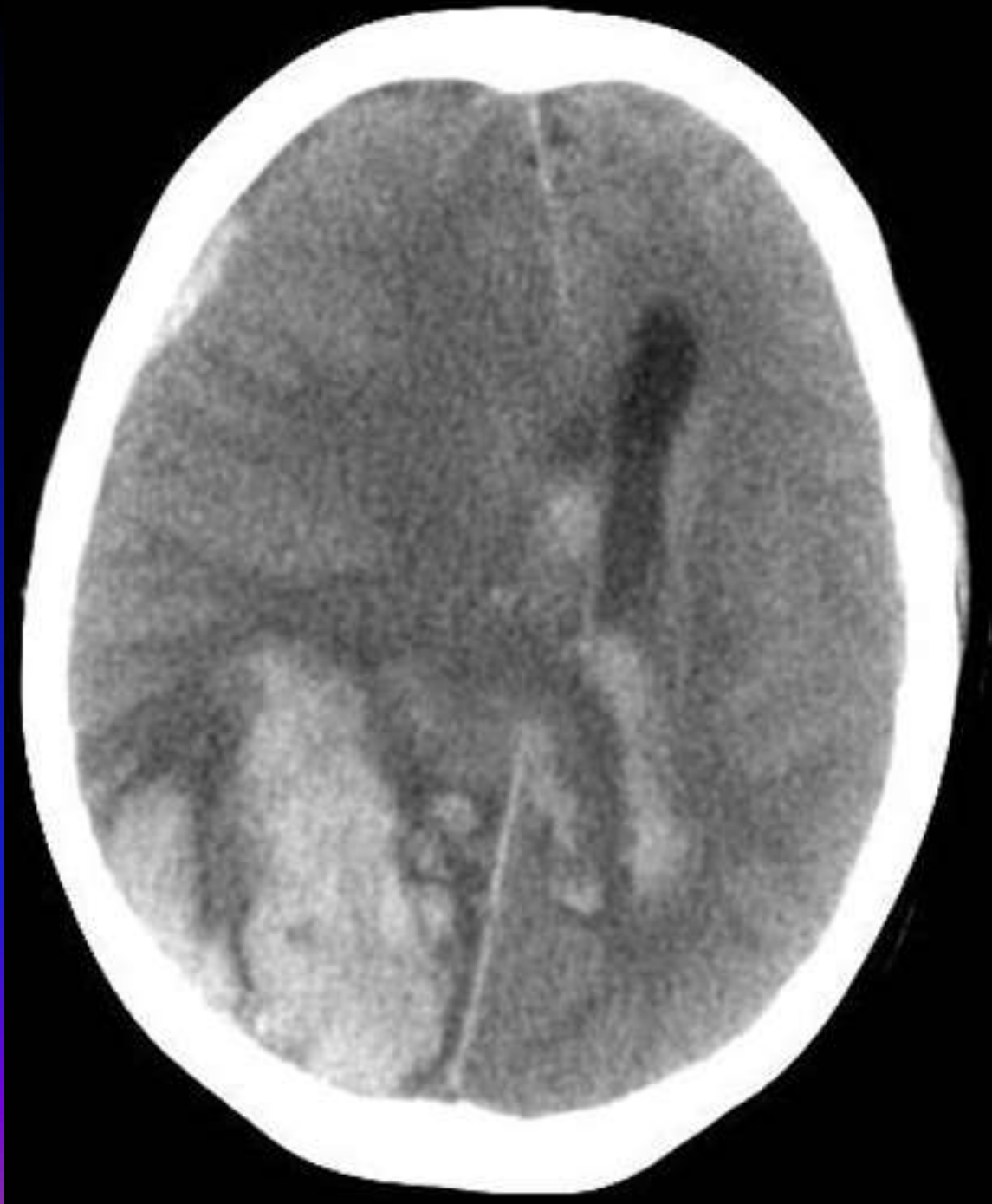
Intra cerebral –
LT basal ganglia
hematoma



Large cerebella
haemorrhage



with intra
ventricular
extension



Intracerebral
haemorrhage
(warfarinised)

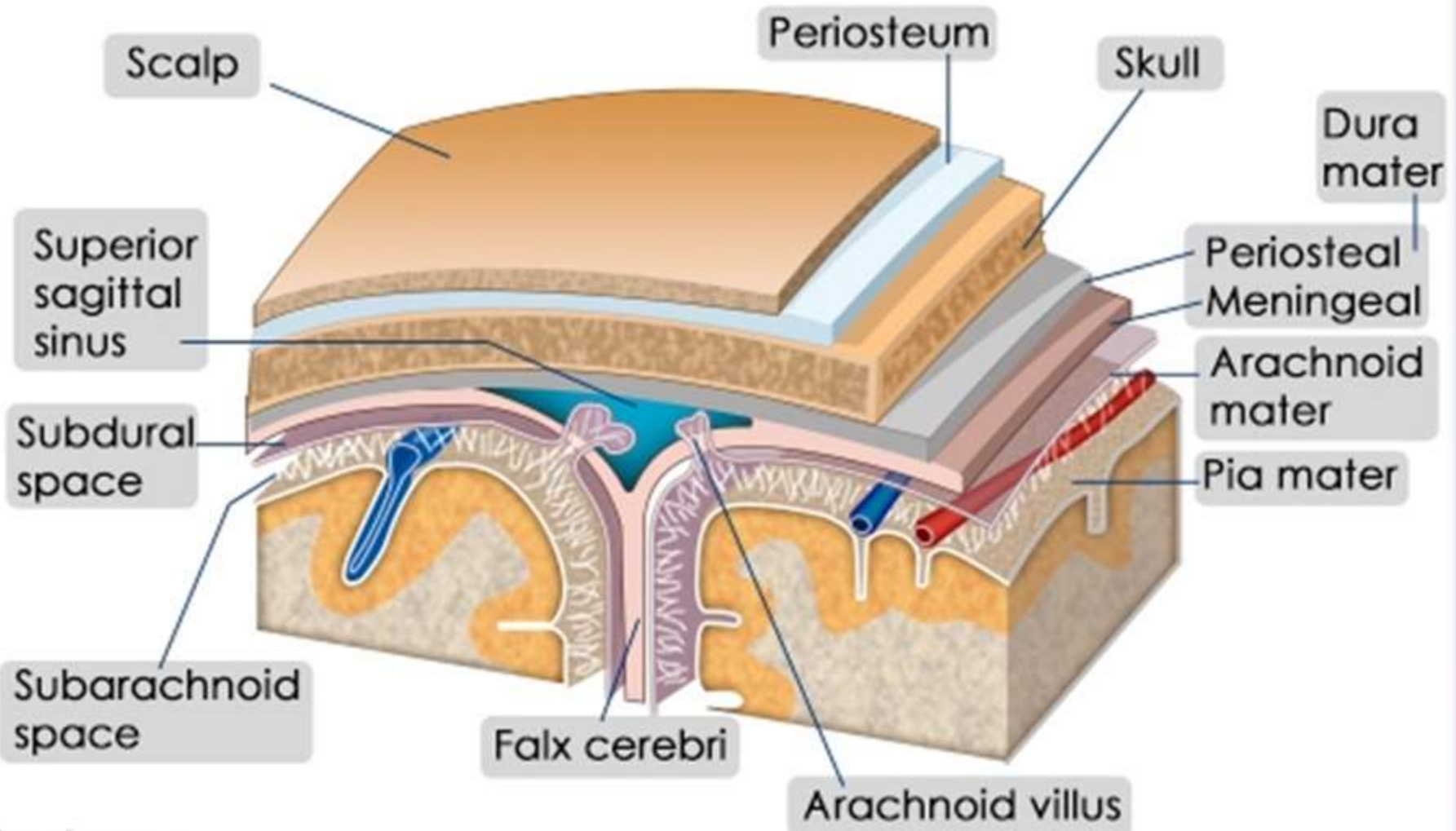
Extra axial

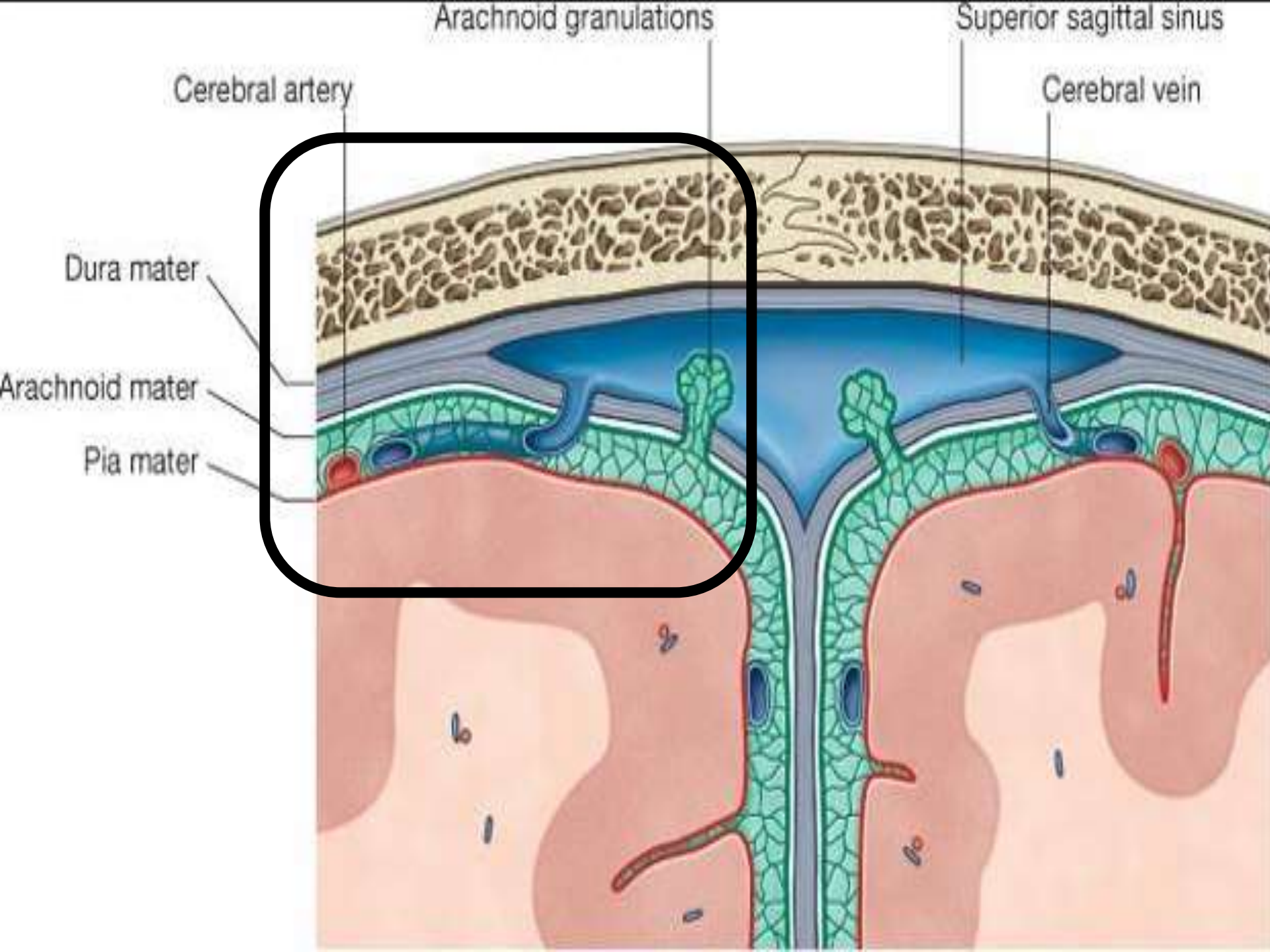
* Extra parenchymal *

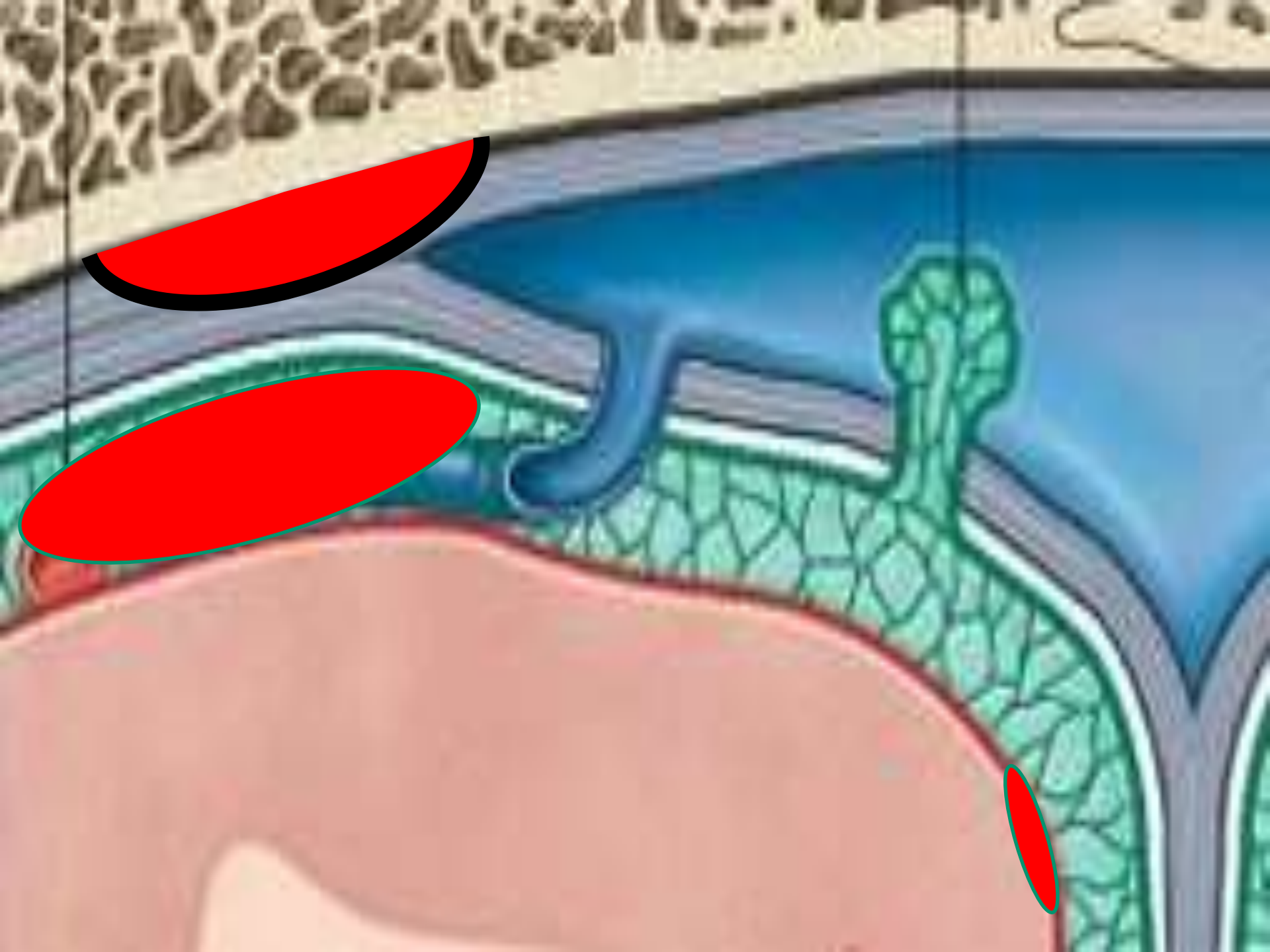
Hematoma

Extra-axial Hematoma

Dura Mater





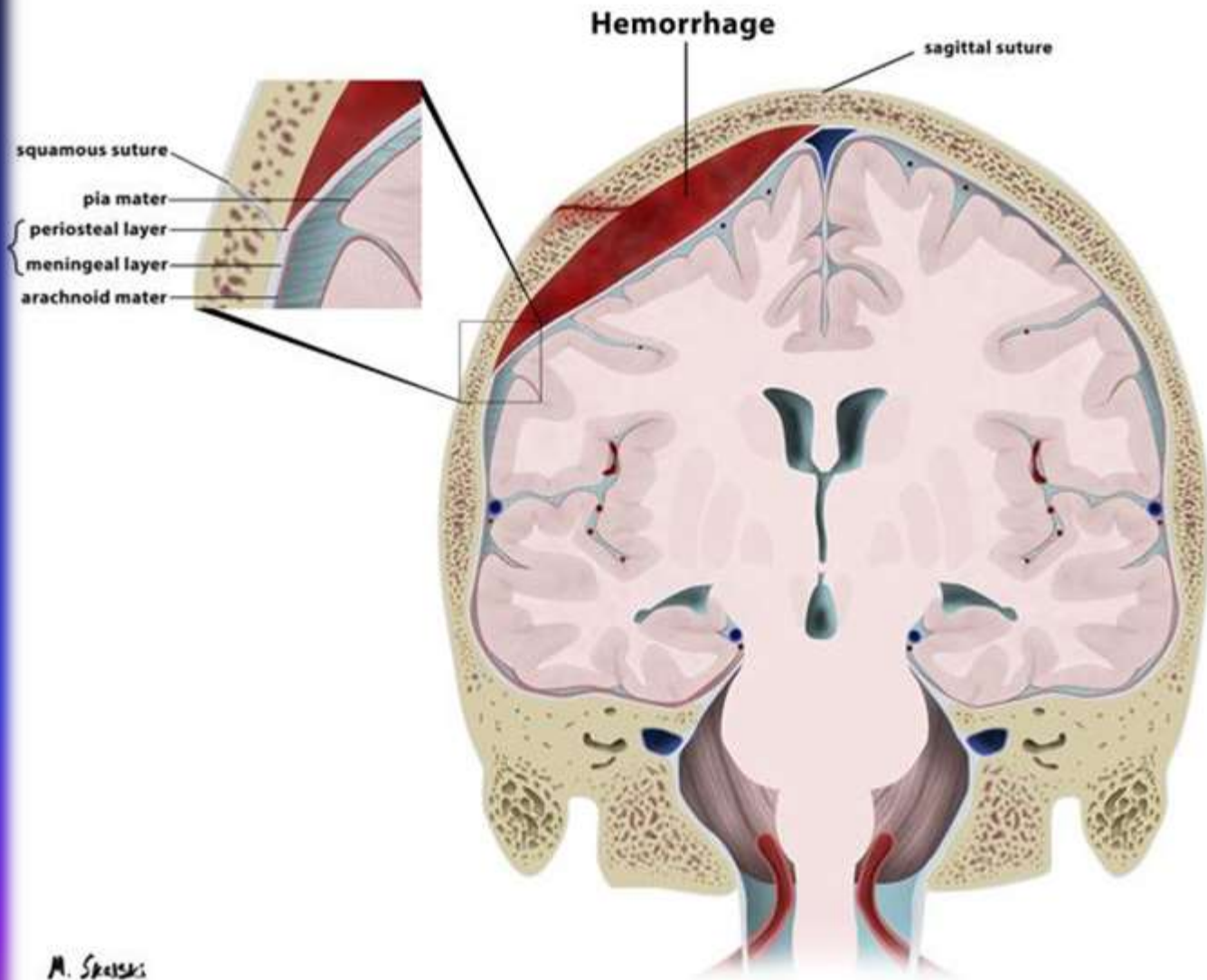


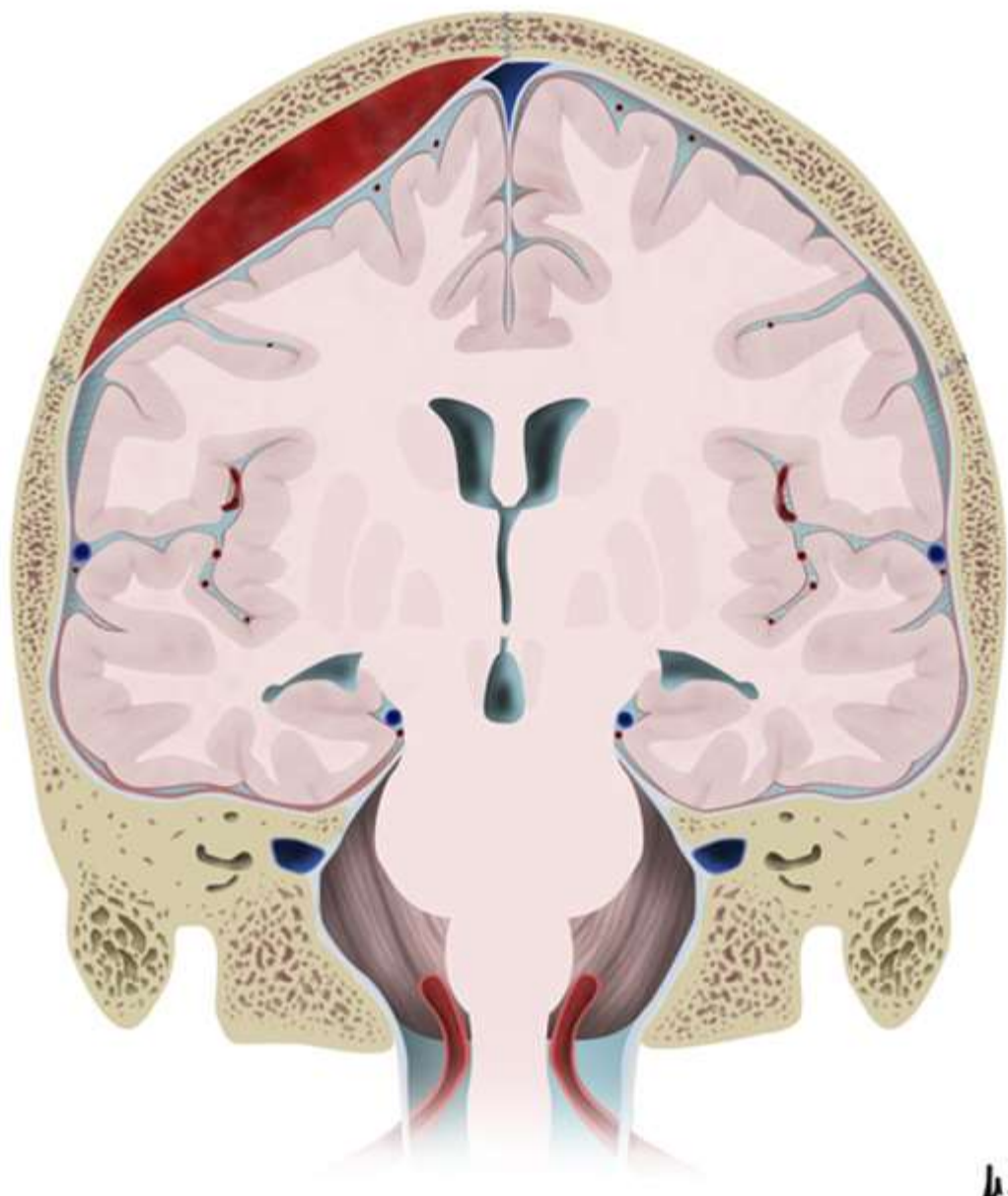
Epidural vs Subdural

	Epidural	Subdural
Vessel involved	Mostly: middle meningeal artery	Bridging veins
Symptoms	Lucid interval followed by Unconsciousness	Gradually increasing headache & confusion
Location	Between the skull and the outer endosteal layer of the dura mater	Between the <i>dura</i> and the arachnoid
Cross Midline	Yes	No
CT appearance	Biconvex lens	Crescent-shaped

Epi-dural Hematoma

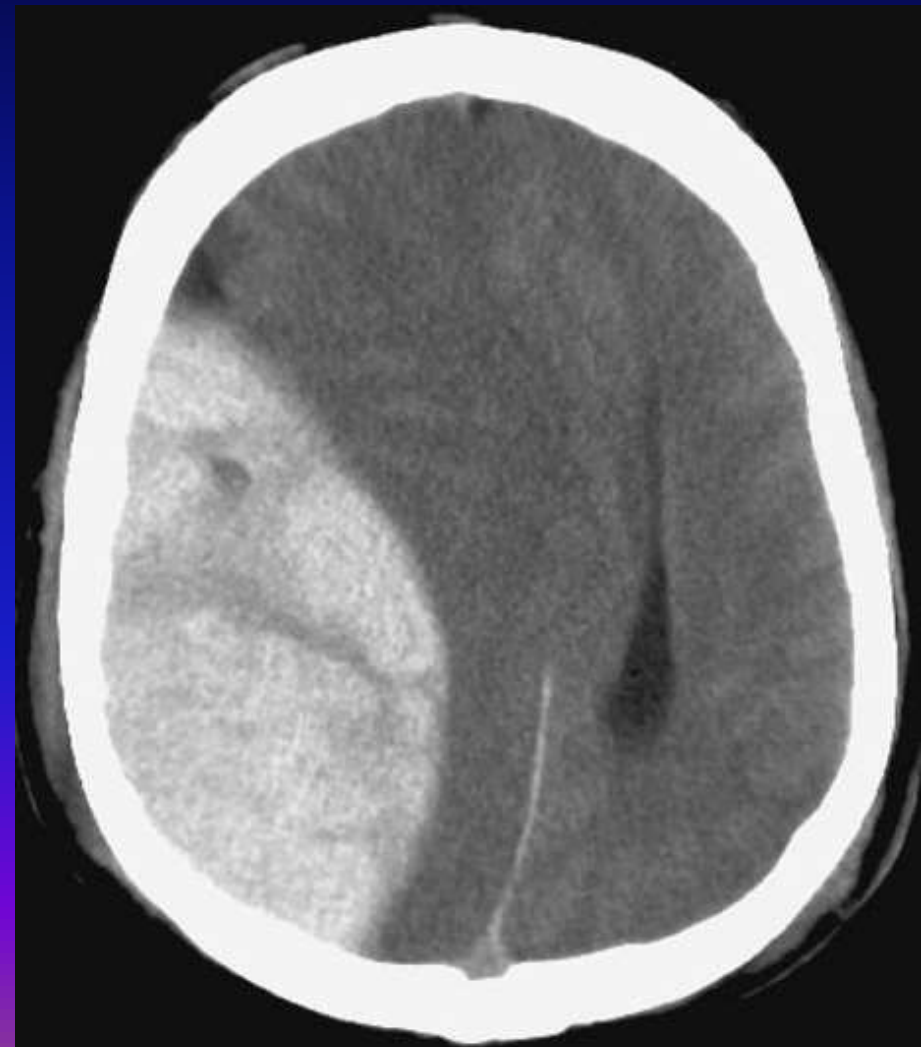
Extradural Hemorrhage

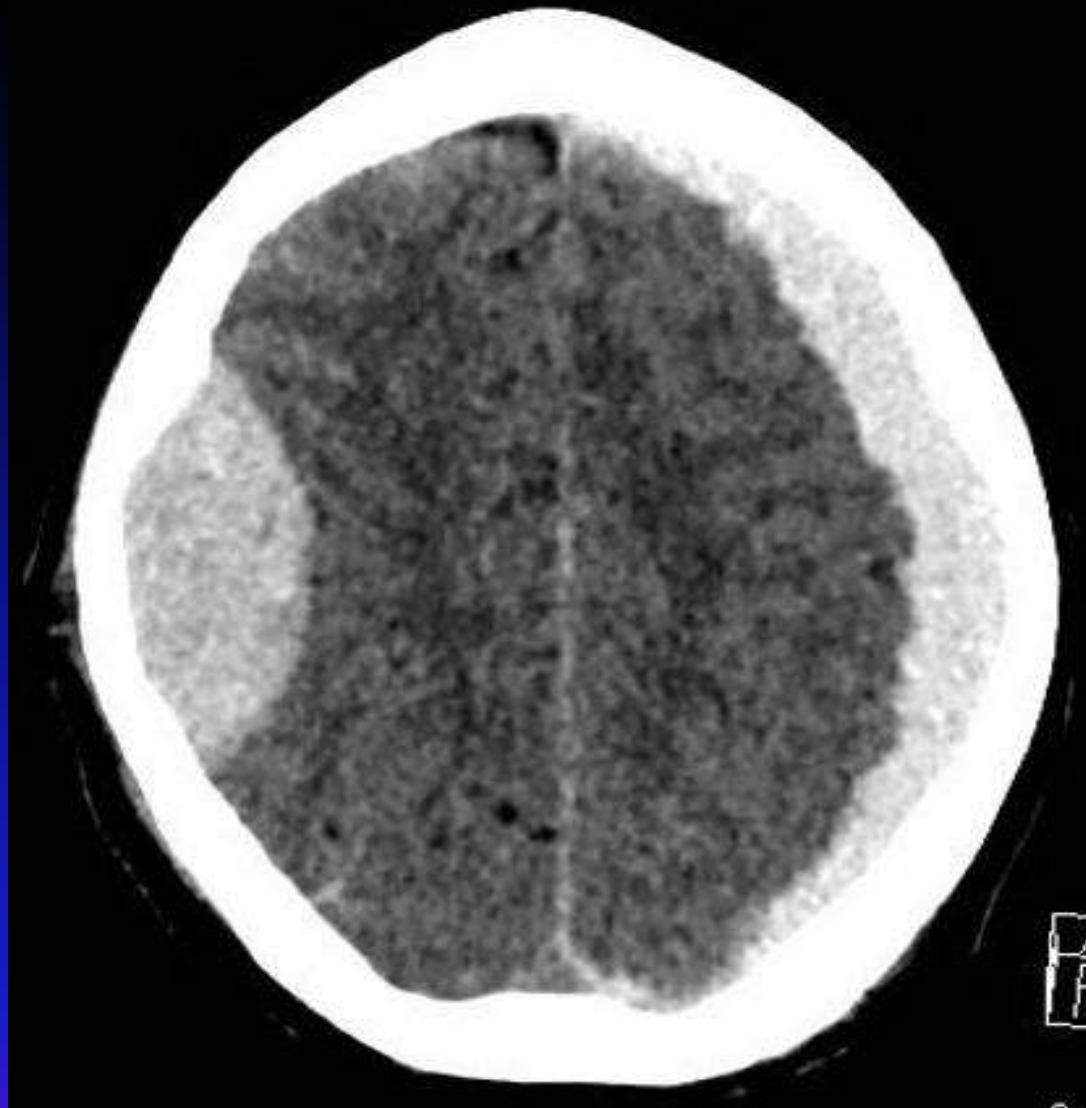




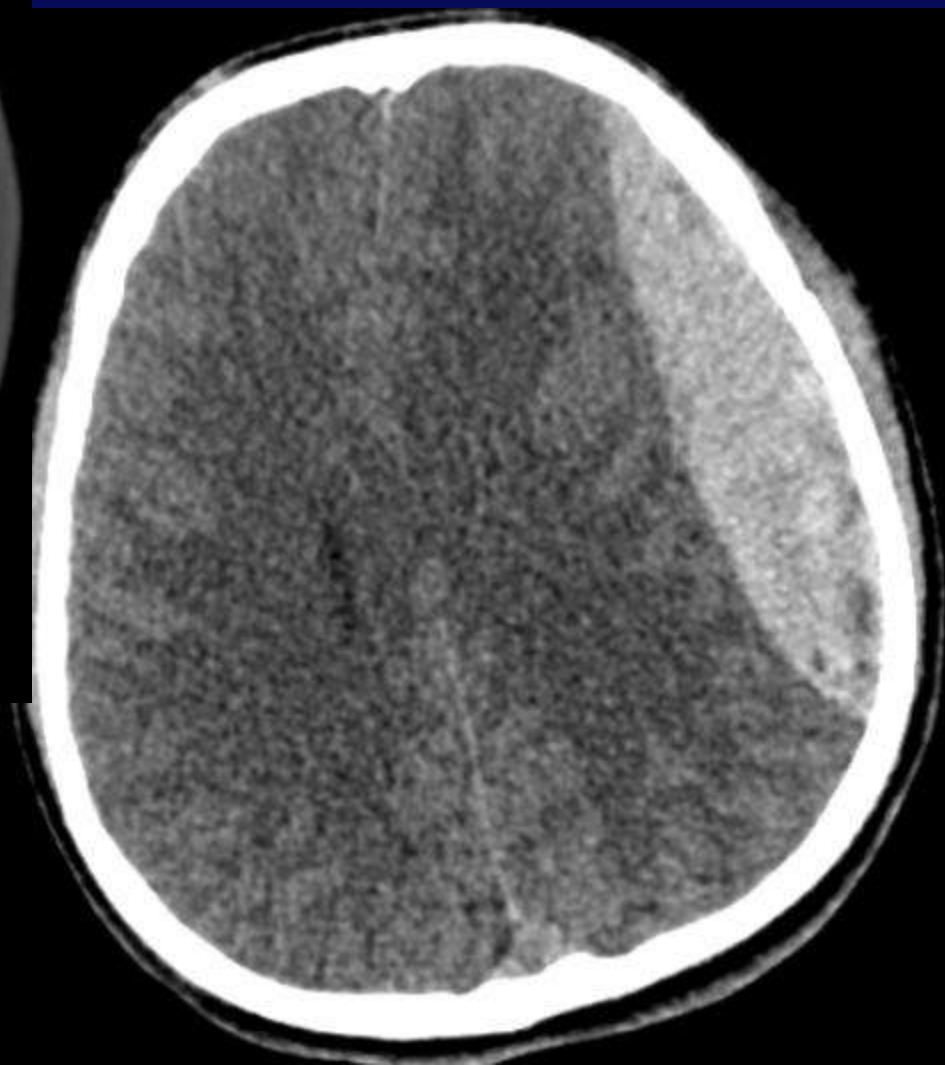
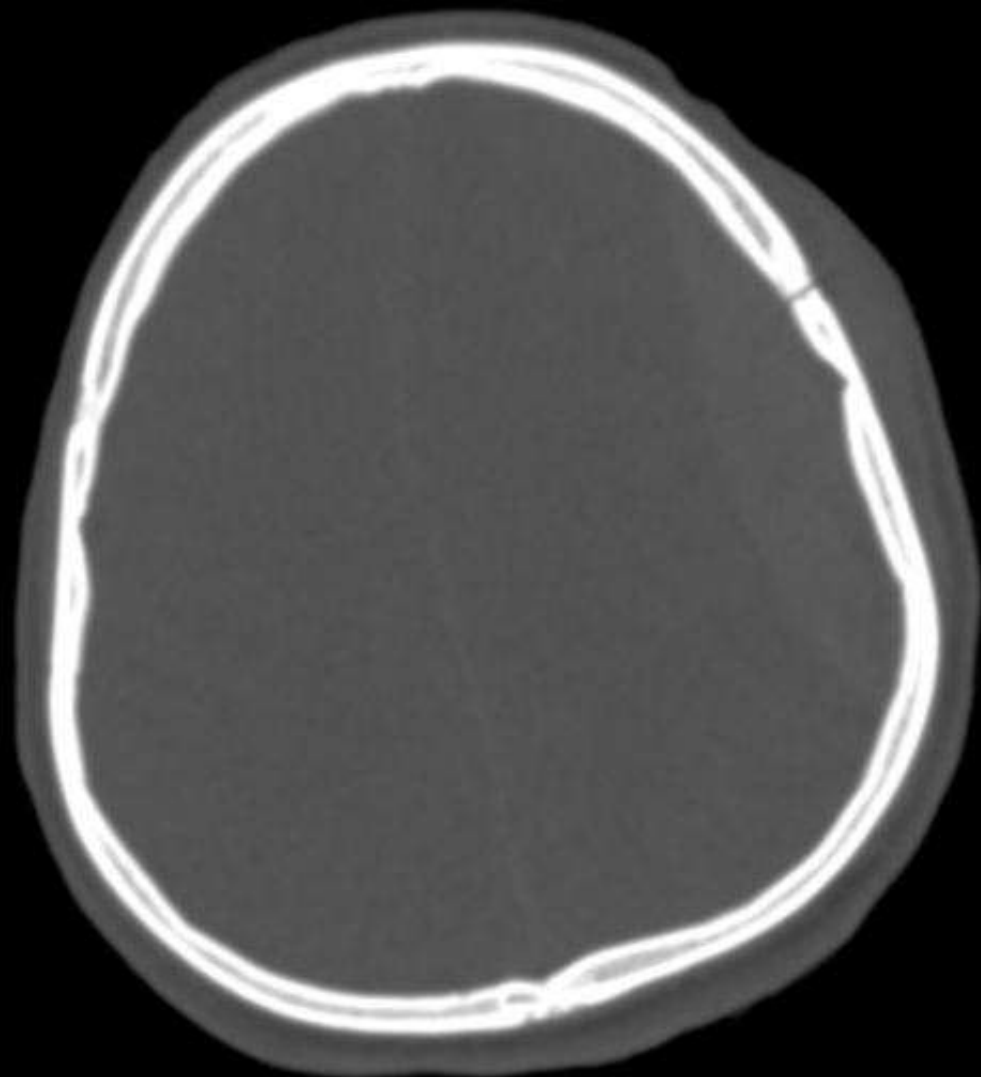
M. Skalski

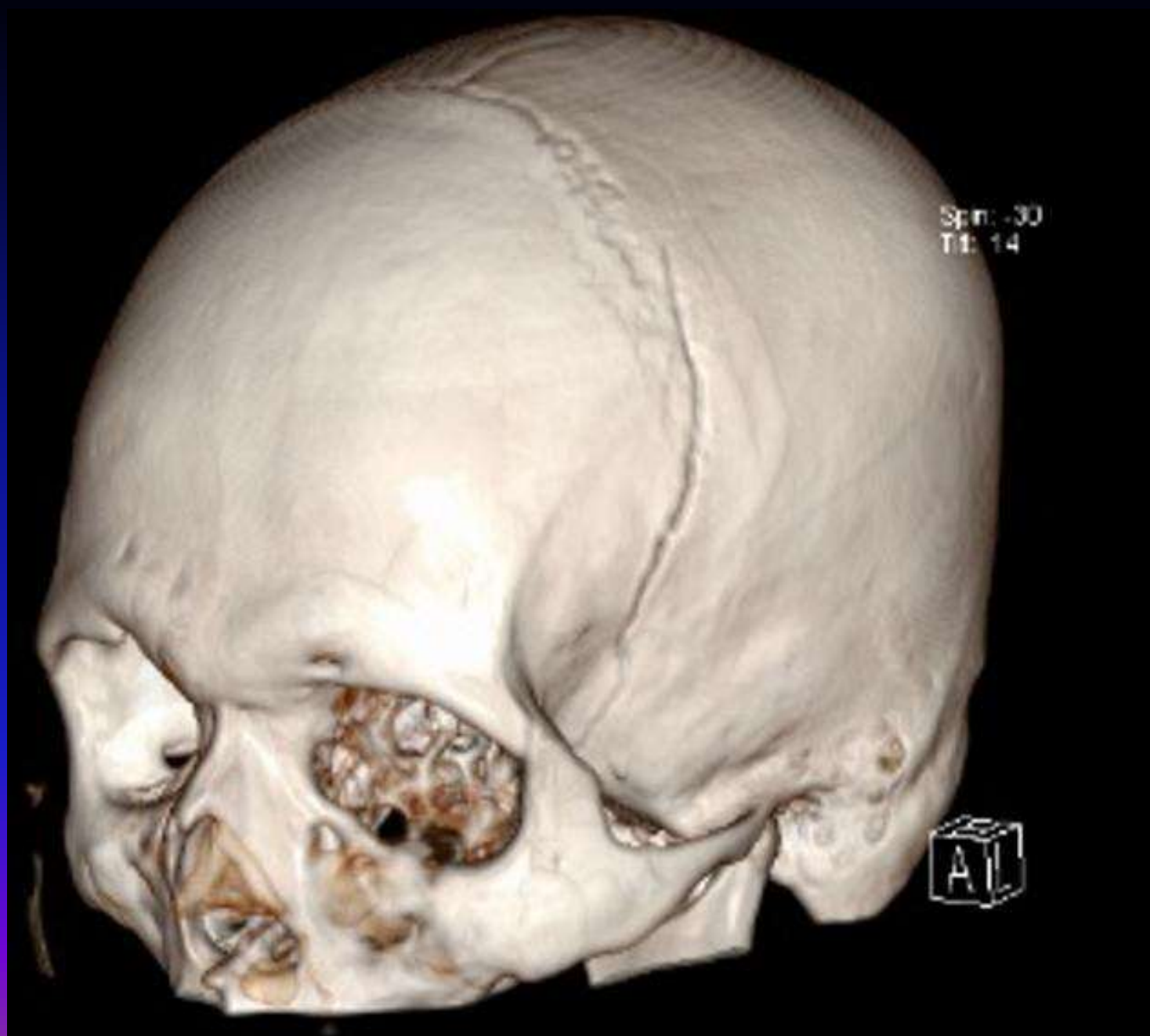






Rt lens shape epidural hemorrhage & Lt crescent shape subdural hemorrhage

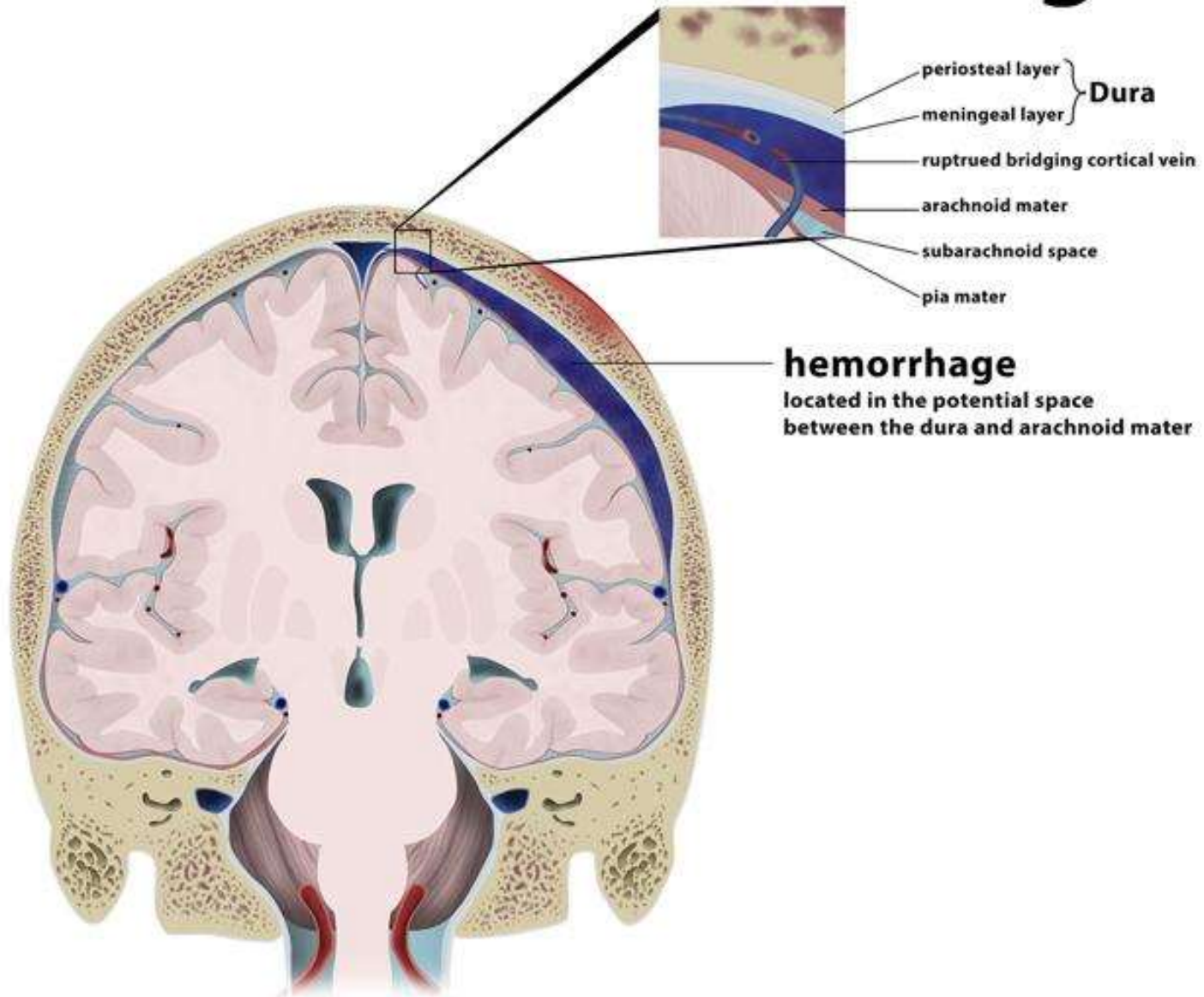


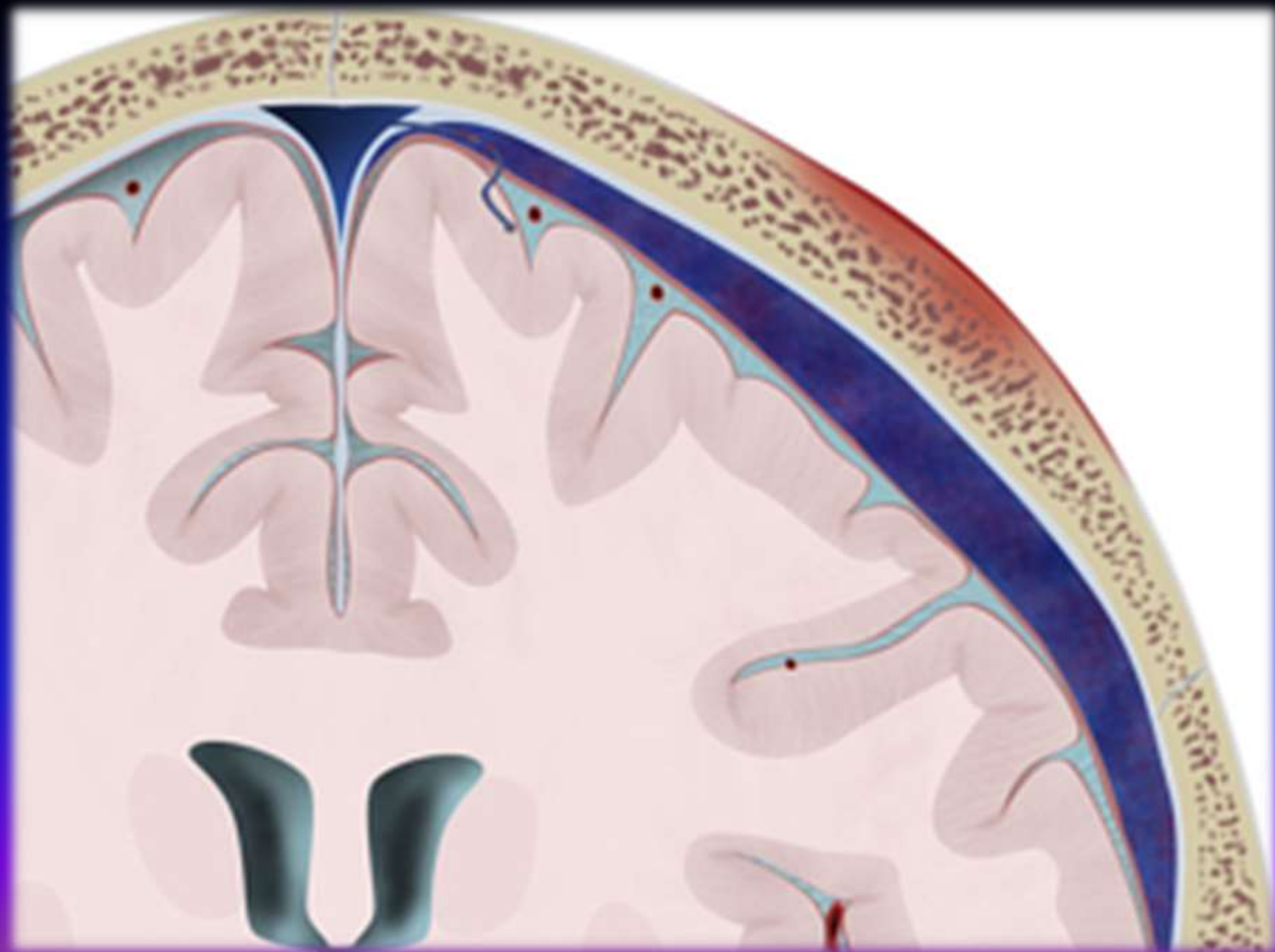




Sub-dural Hematoma

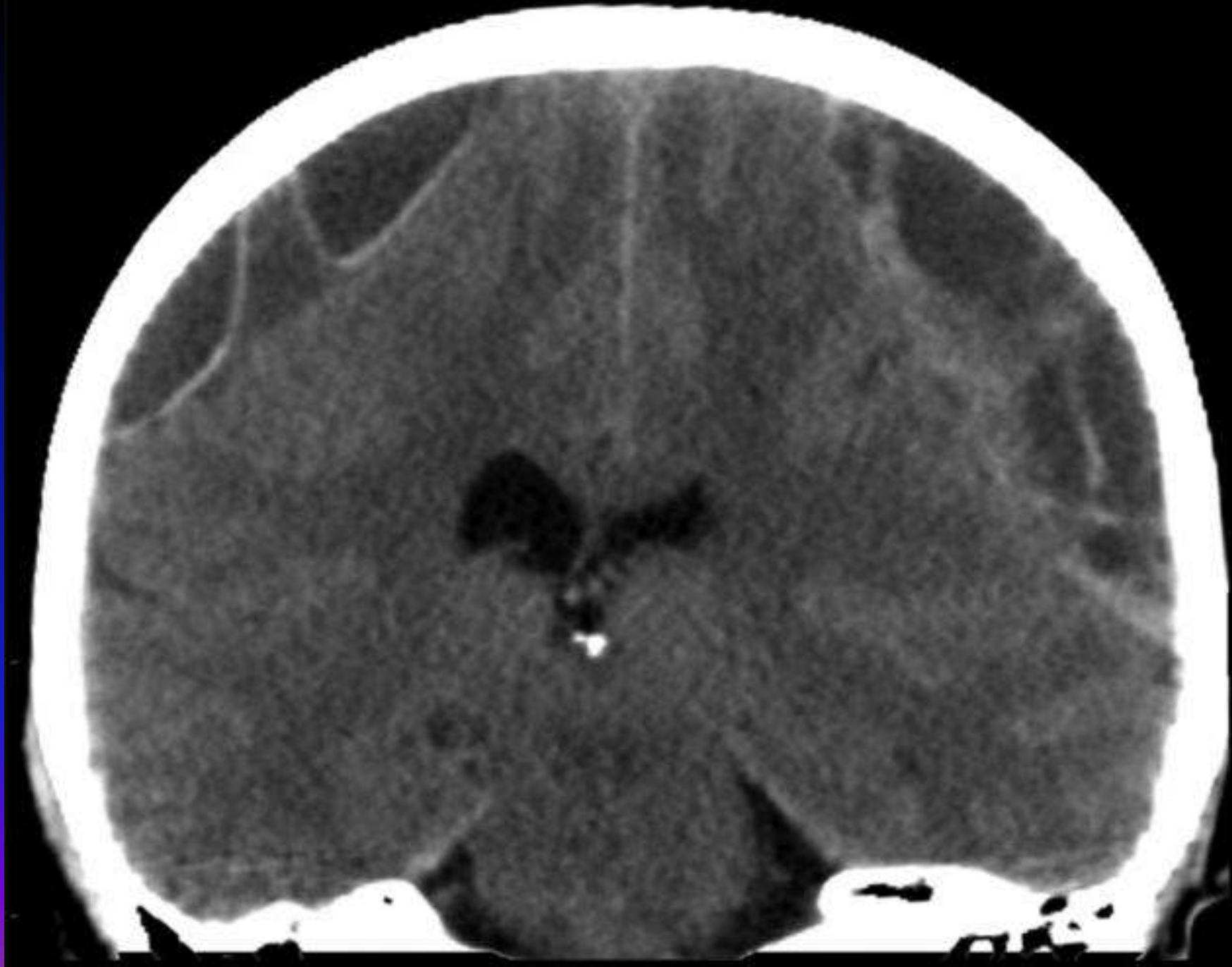
Subdural hemorrhage







Rt sub-dural hemorrhage (crescent shape appearance)







Subarachnoid Hge

[R]

[L]

Blood

SP:-151.5mm

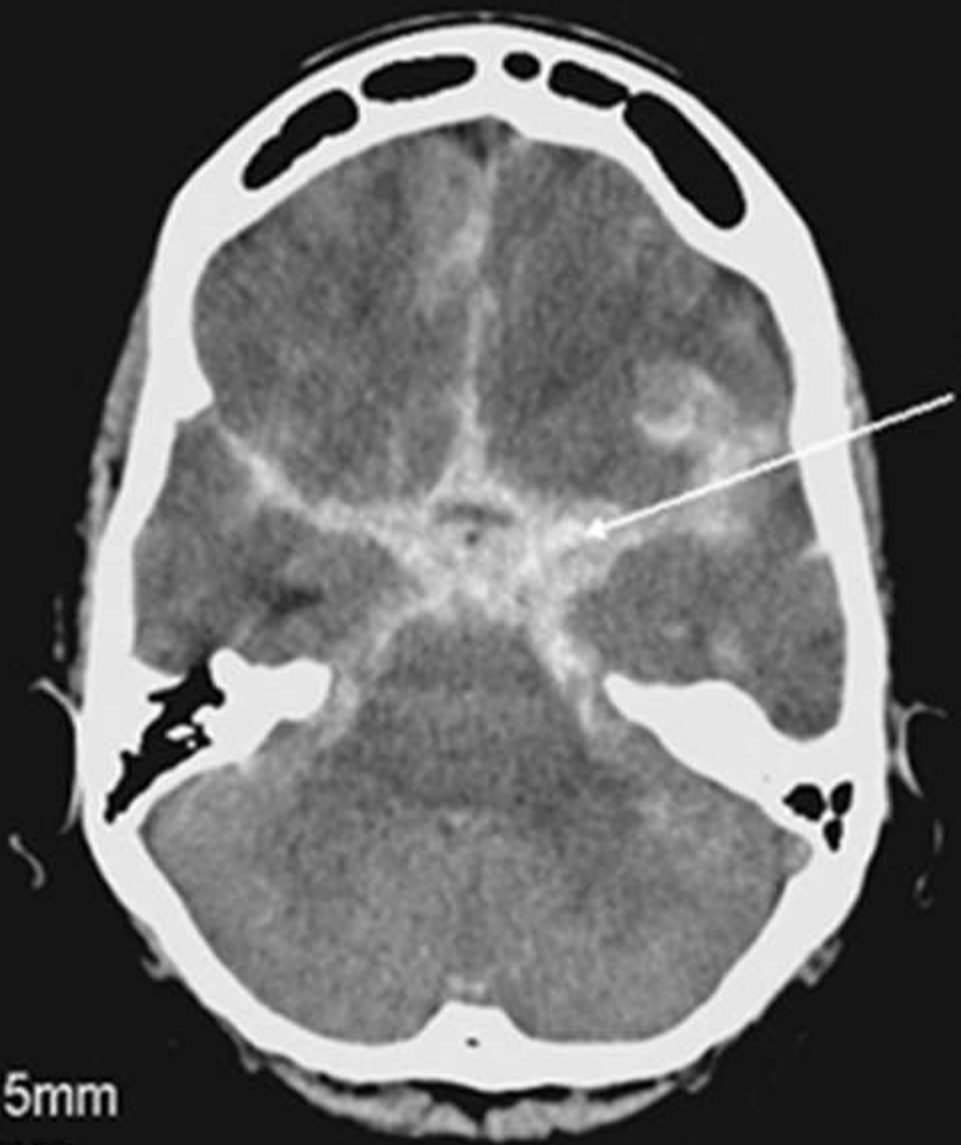
ST: 5.0mm

C35

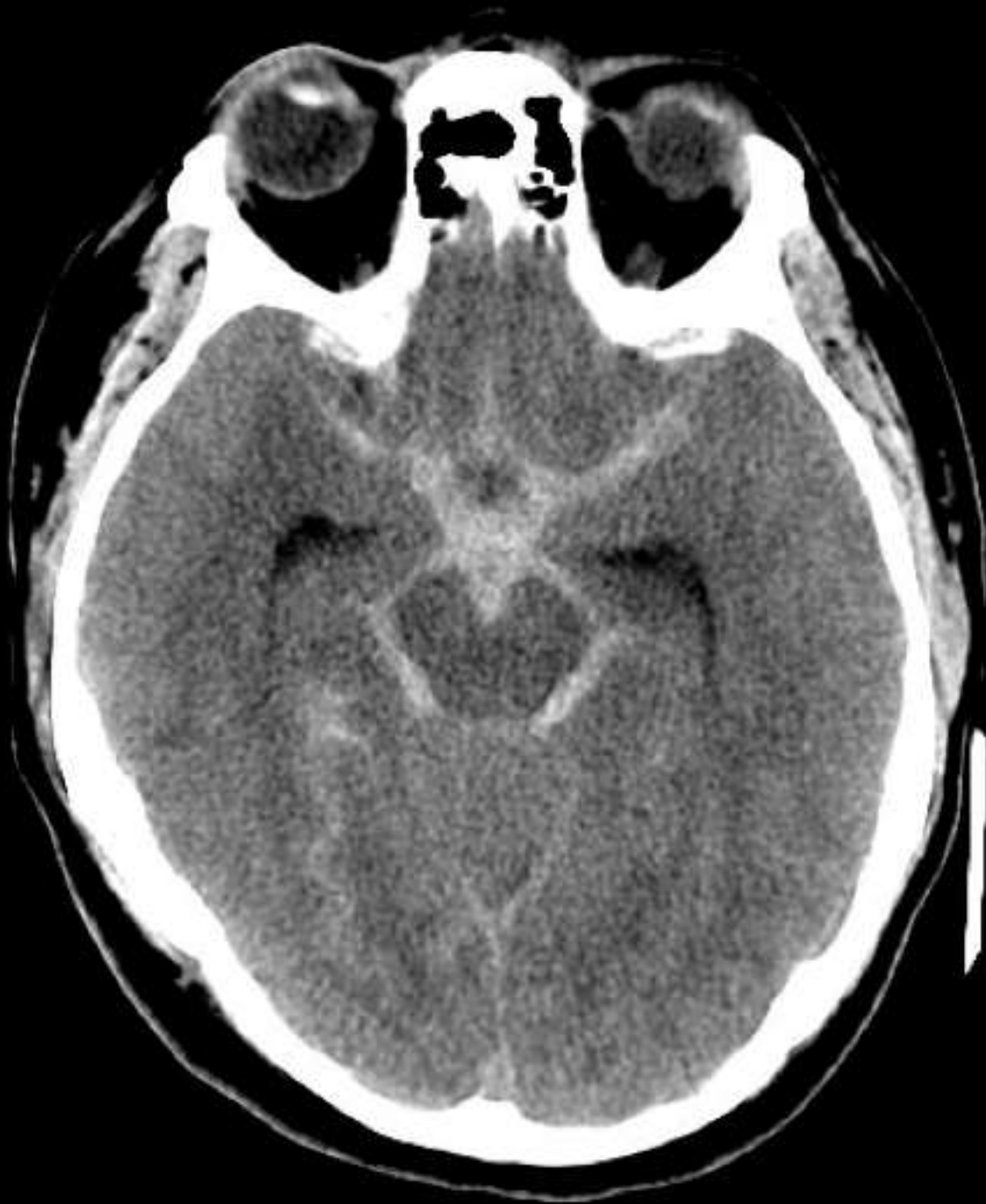
W70

[PF]

Marconi









Thank
You!

سبحانك اللهم وبحمدك
أشهد أن لا إله إلا أنت
استغفرك وأتوب إليك