

# ANATOMY IN CLINICAL PRACTICE - SKULL, MENINGES, HEAD AND NECK VESSELS, NERVES AND LYMPHATICS

# BIOMECHANICS

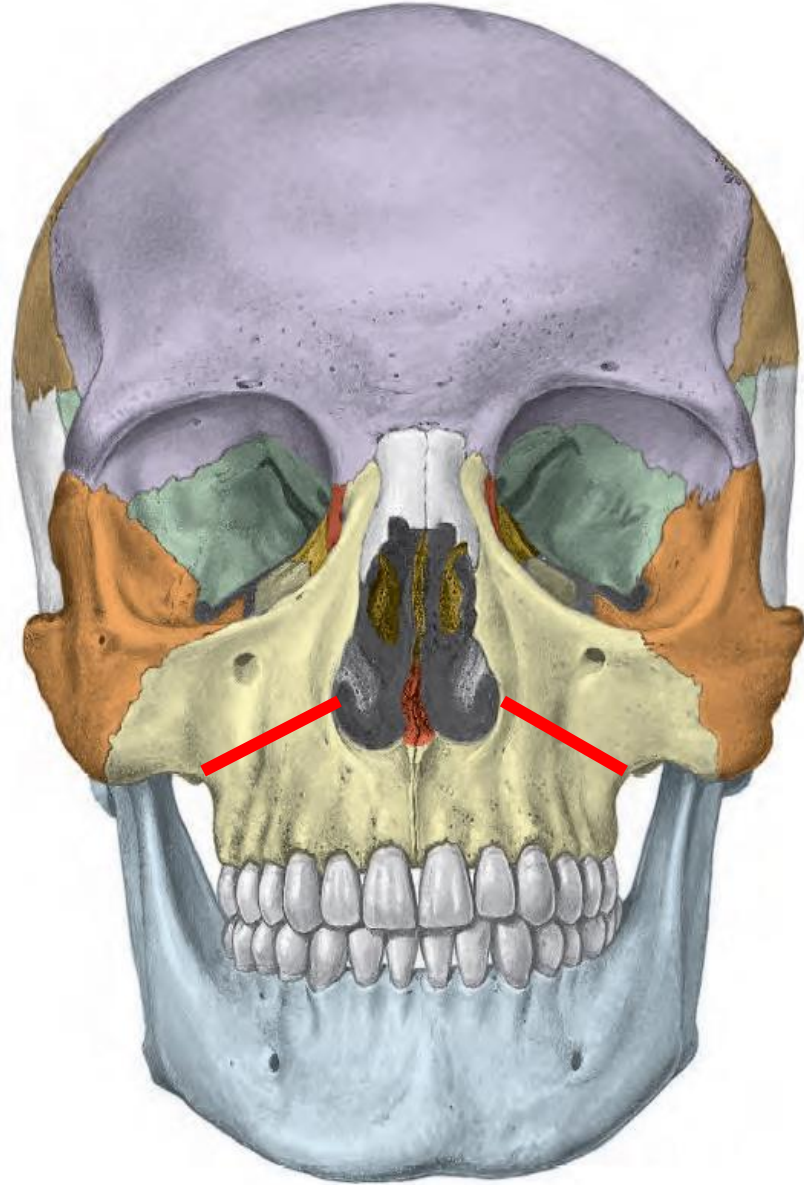
- 💧 **Injury of splanchnocranium**
- 💧 **Maxilofacial complex**
  - 💧 Fractures in weak points or lines
- 💧 **Classification according LeFort**
  - 💧 LeFort I - fracture of alveolar process - line to apertura piriformis
  - 💧 LeFort II - midface fracture
  - 💧 LeFort III - whole facial skeleton released from neurocranium

# splanchnocranium

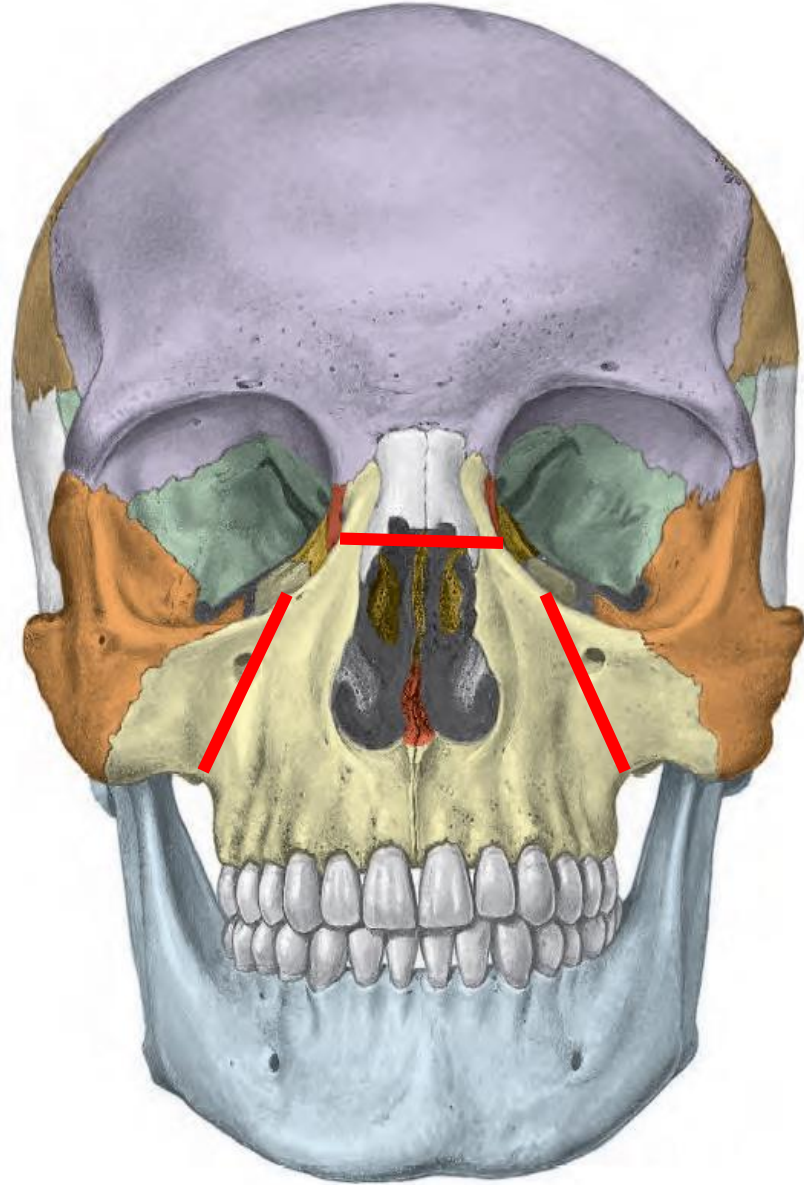
## 🔥 Fracturae maxillofaciales - LeFort



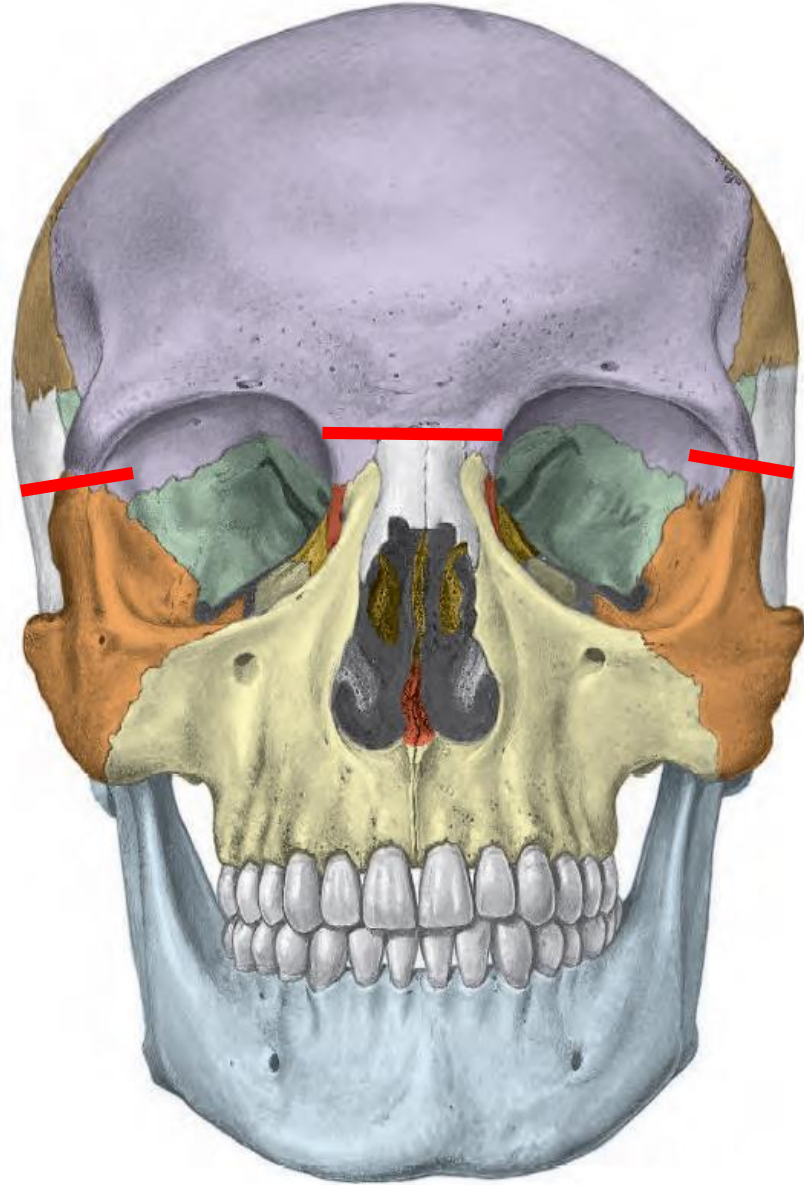
# LeFort I



# LeFort II



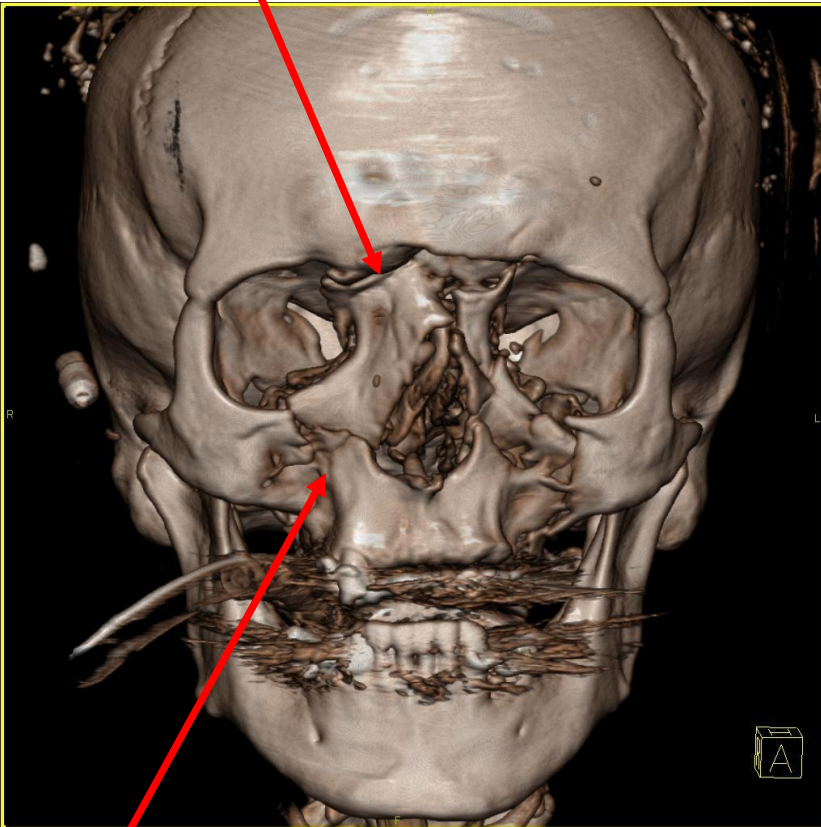
# LeFort III





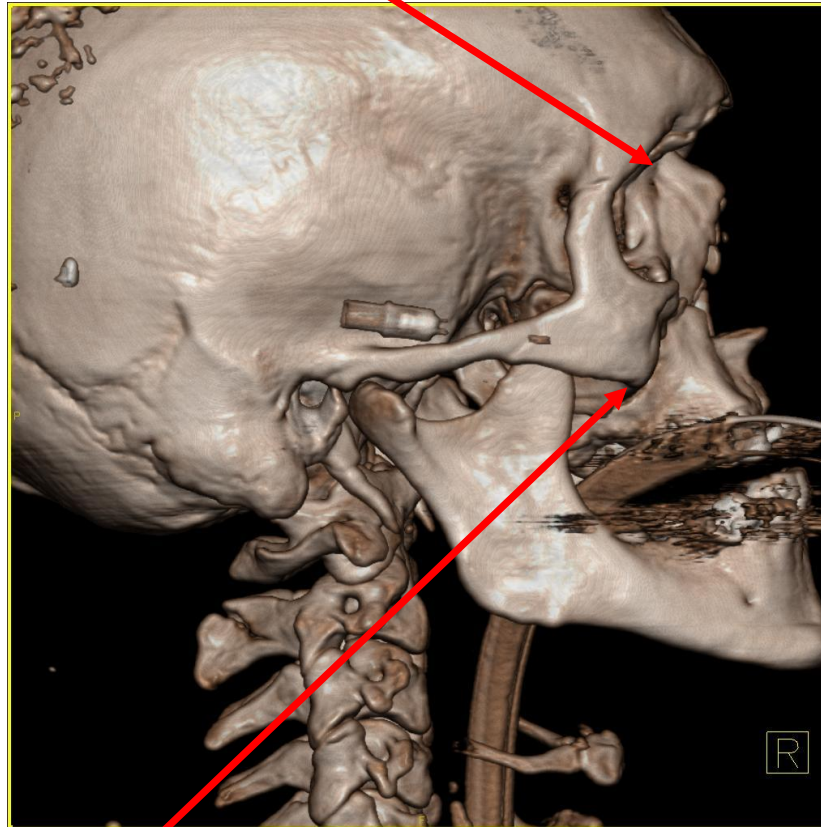
# Fracturae maxillofaciales

Linea fracturae LeFort II



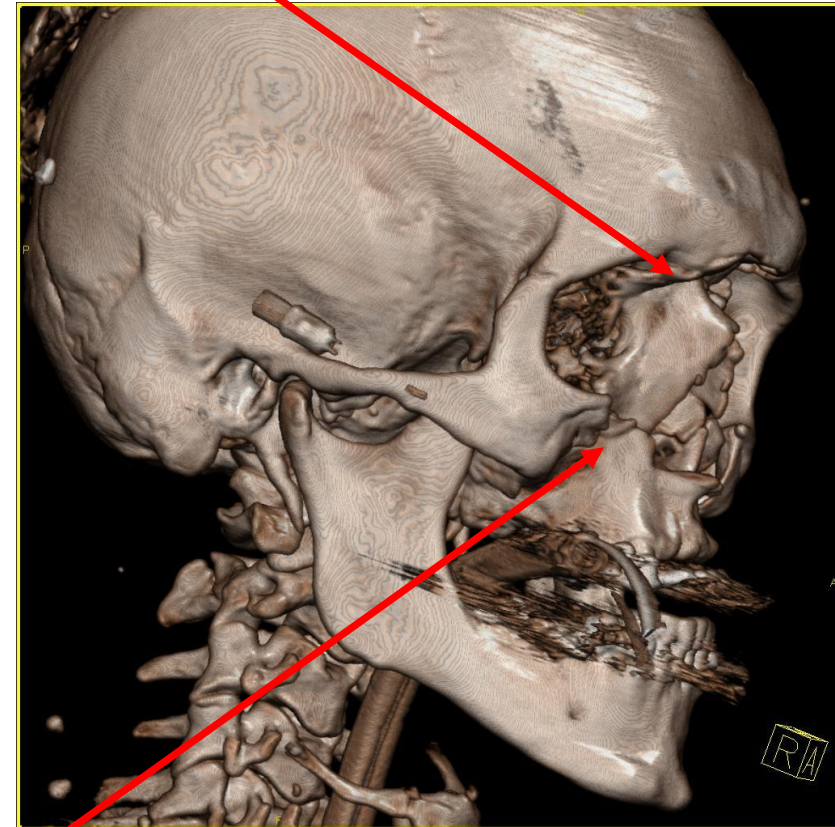
Linea fracturae LeFort I

Linea fracturae LeFort II



Linea fracturae LeFort I

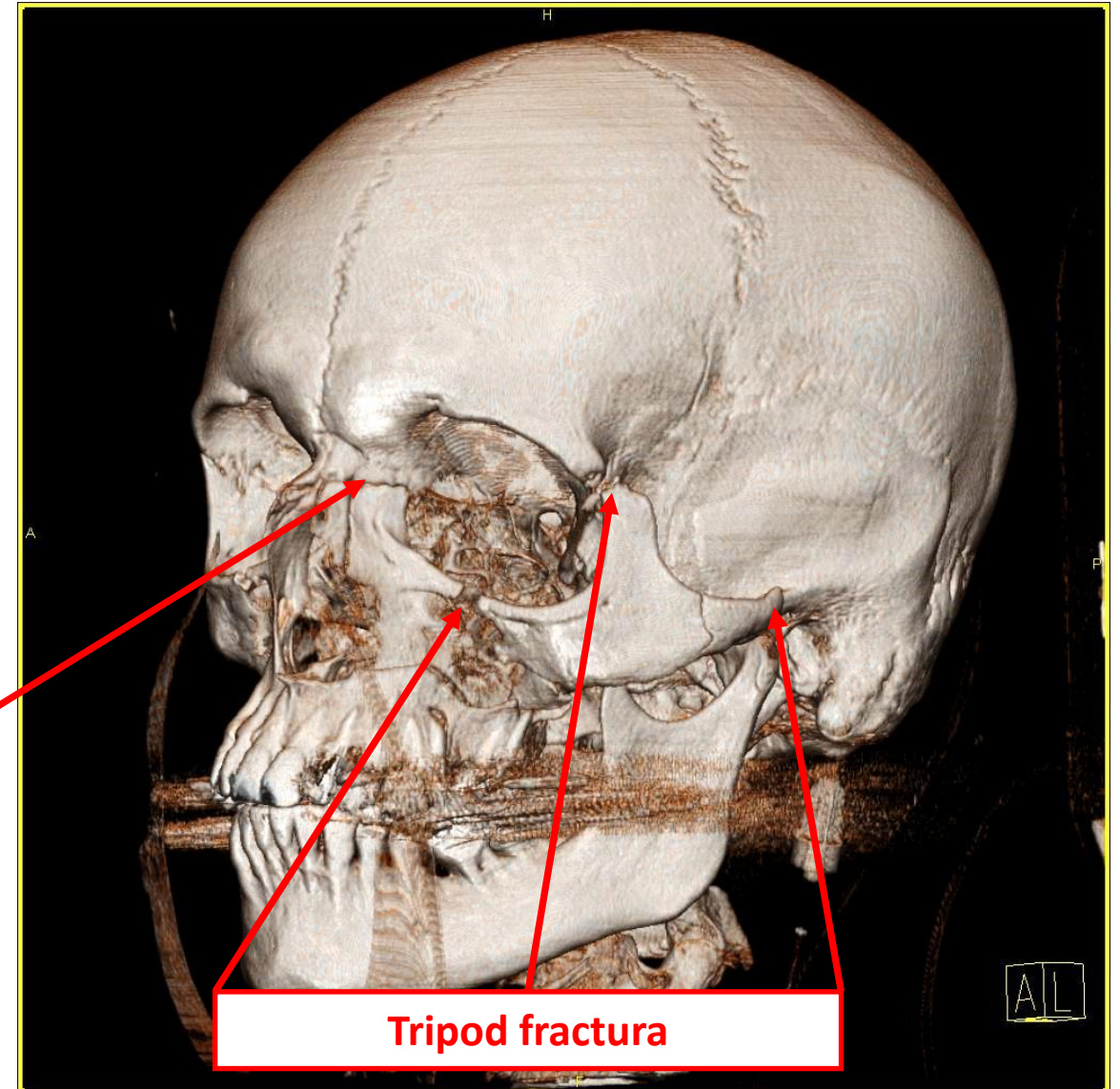
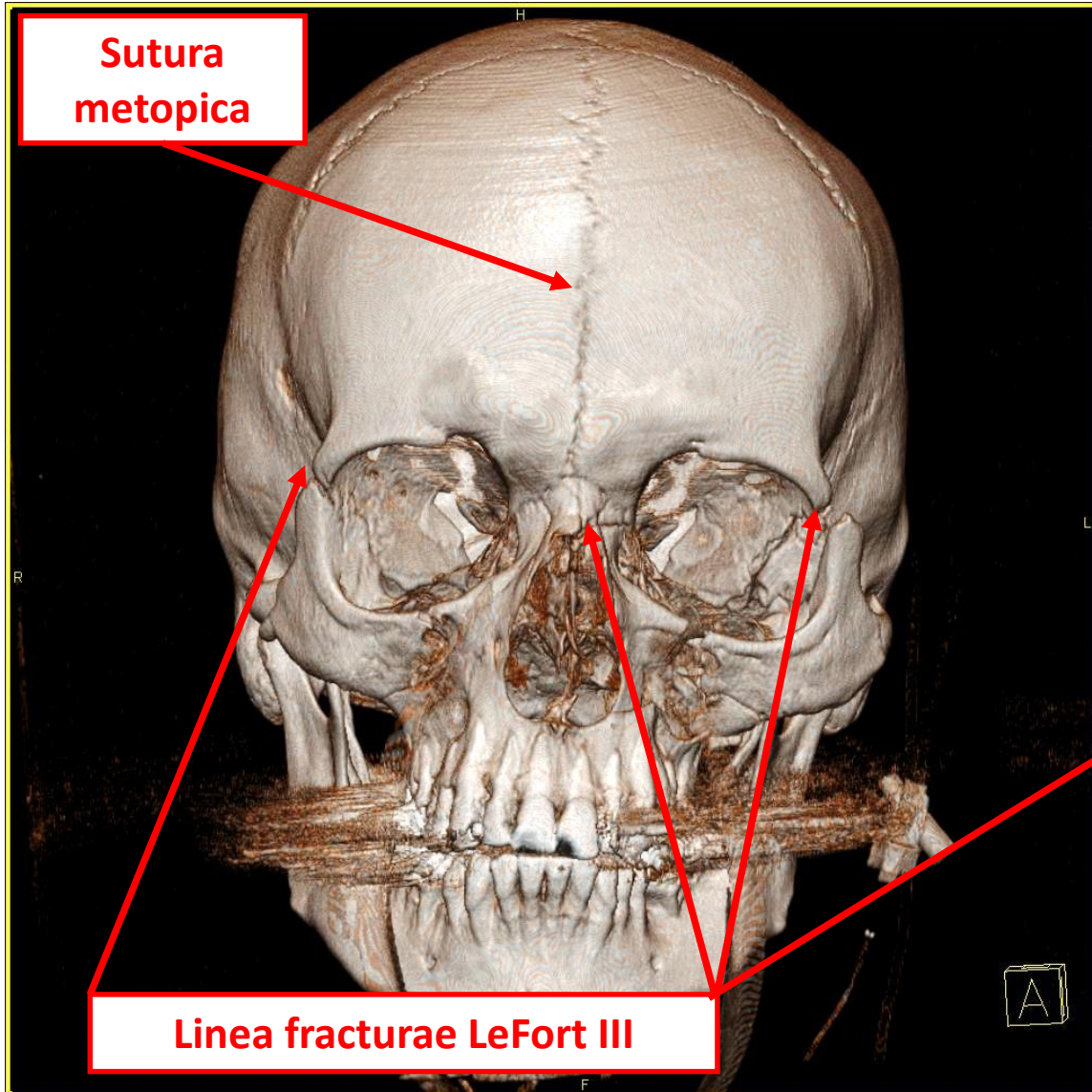
Linea fracturae LeFort II



Linea fracturae LeFort I

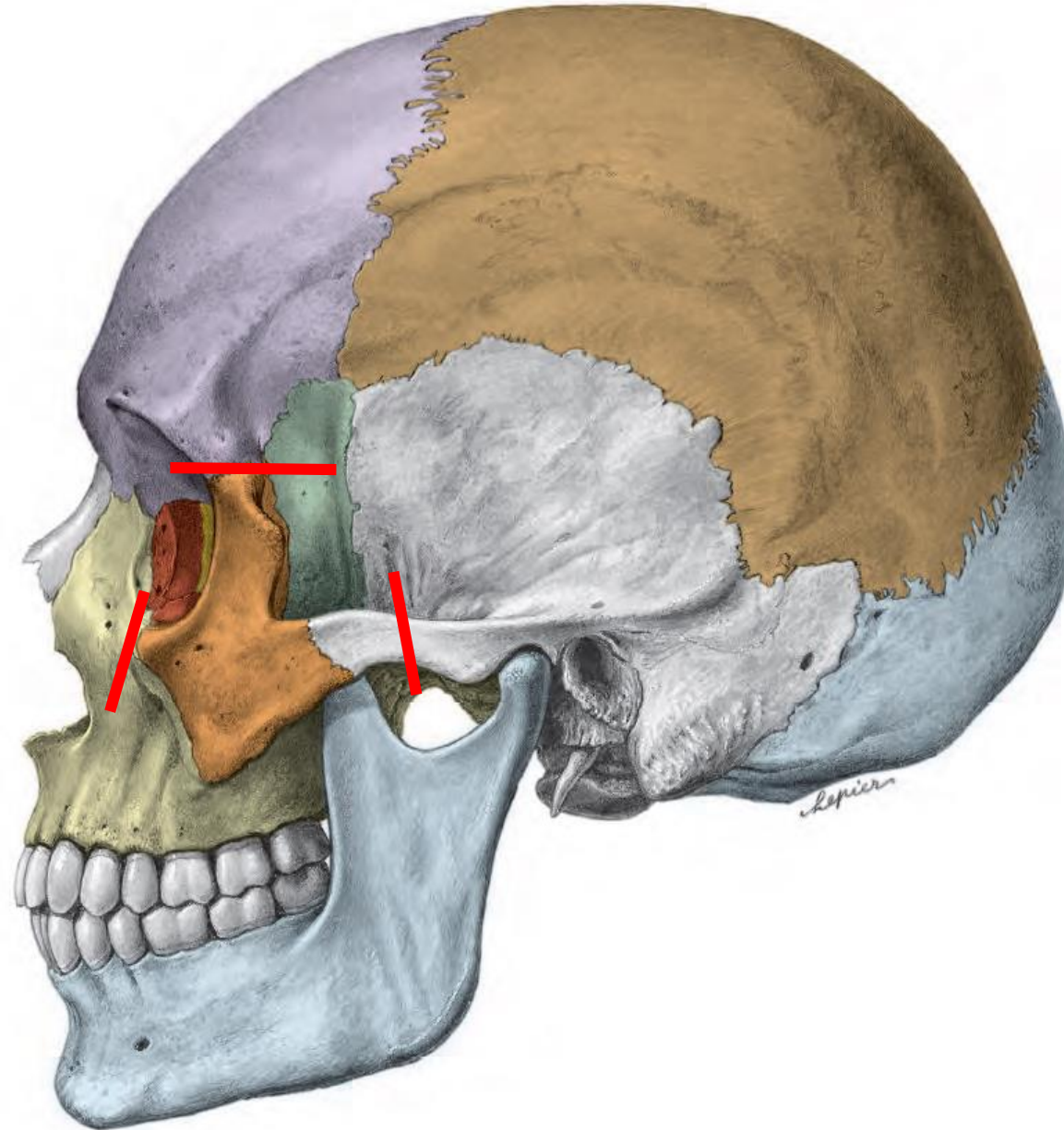


# Tripod - fractura + fractura LeFort III

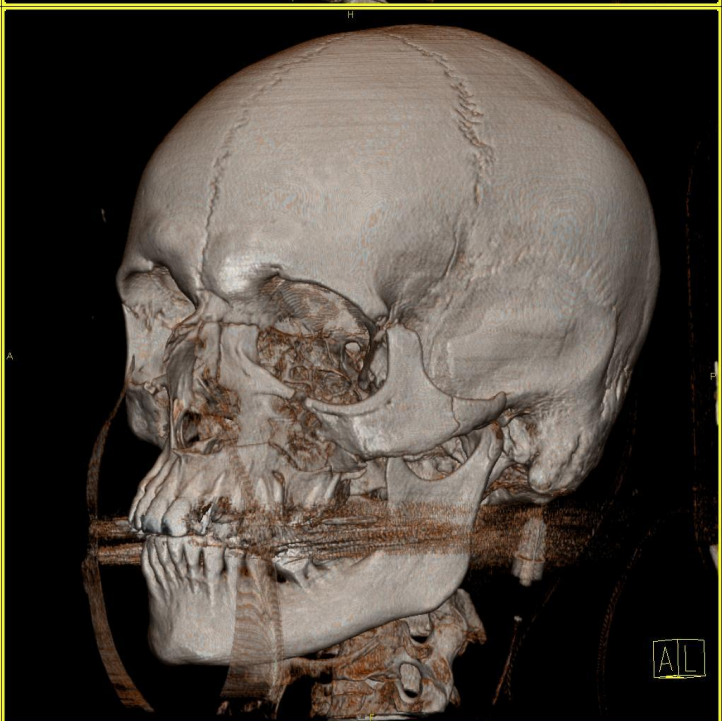
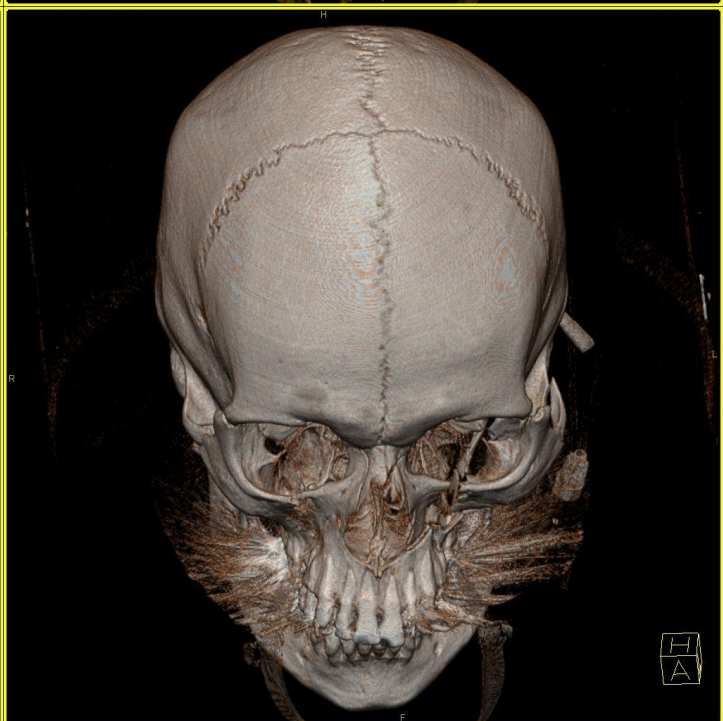
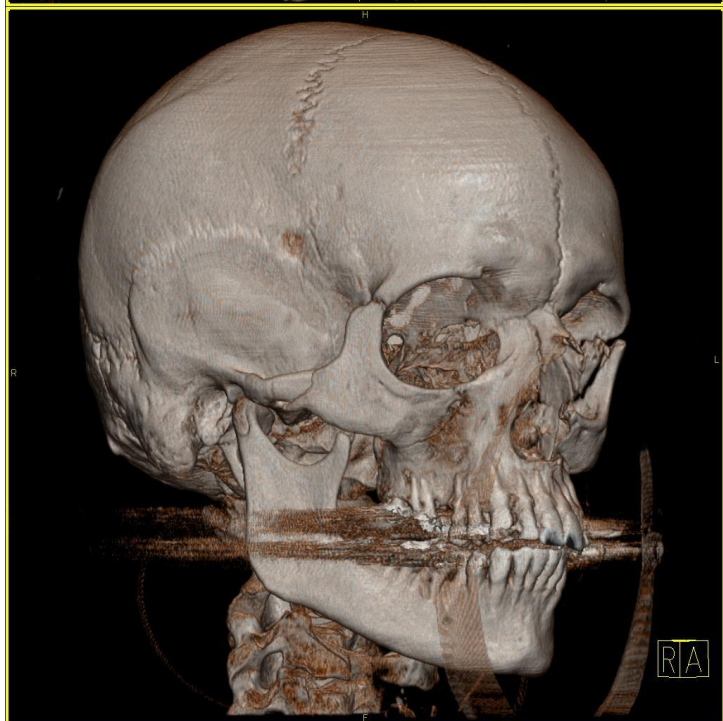
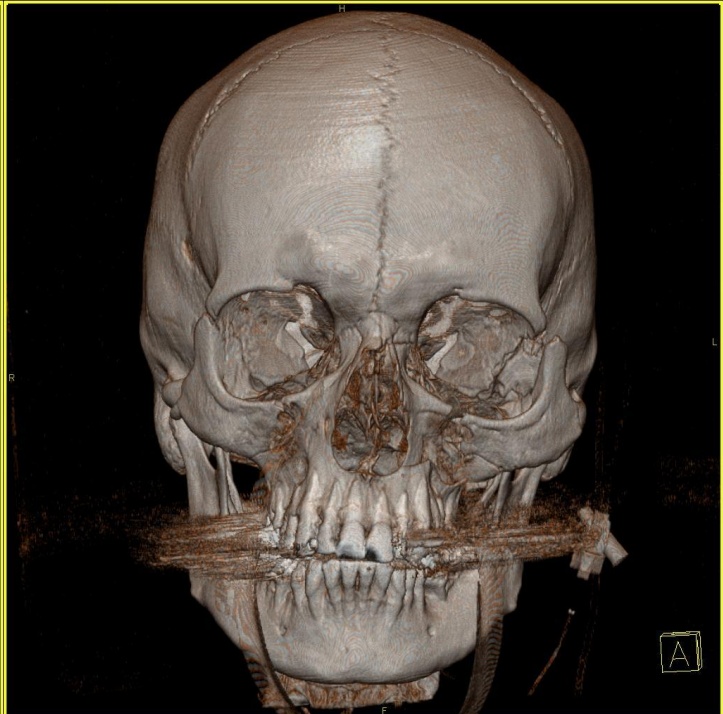
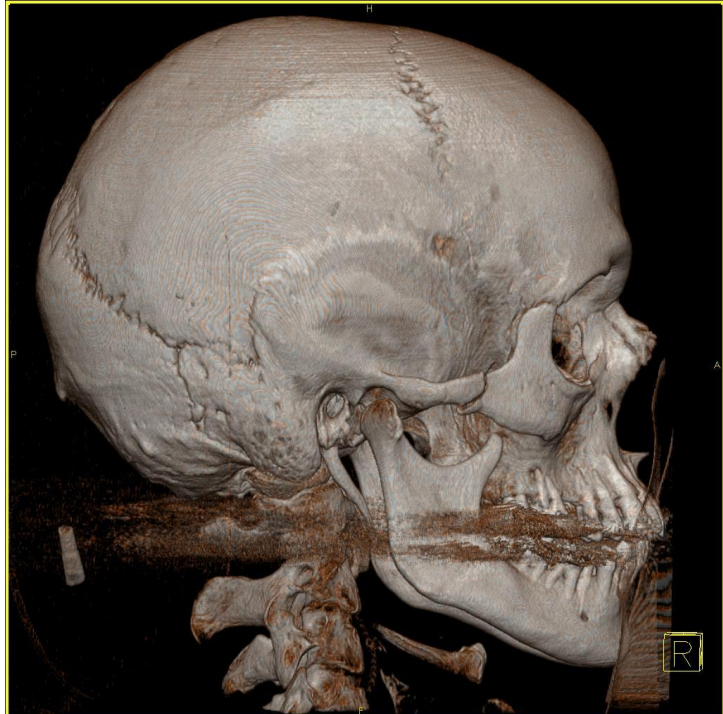




# Tripod fracture of zygomatic bone

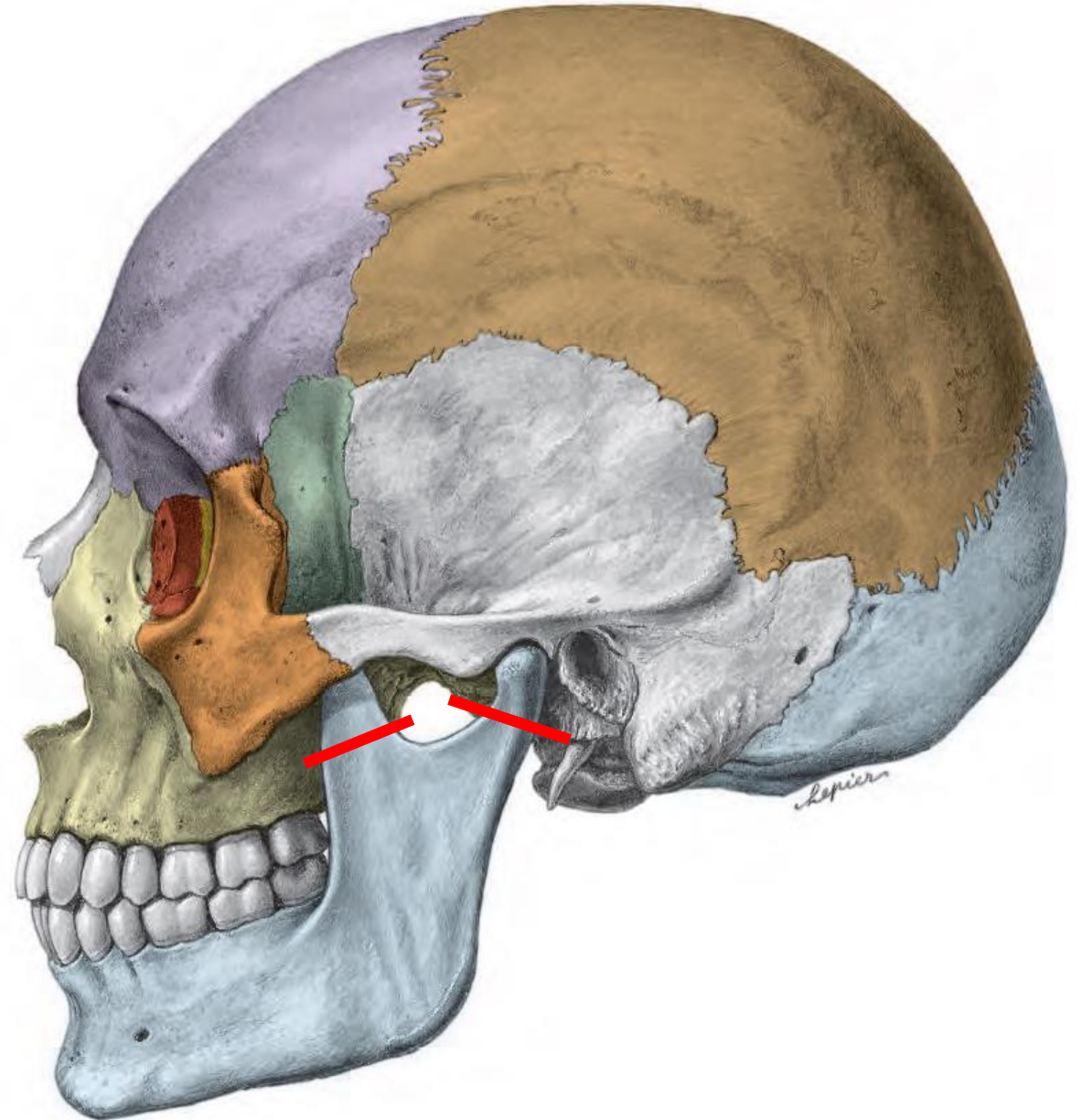
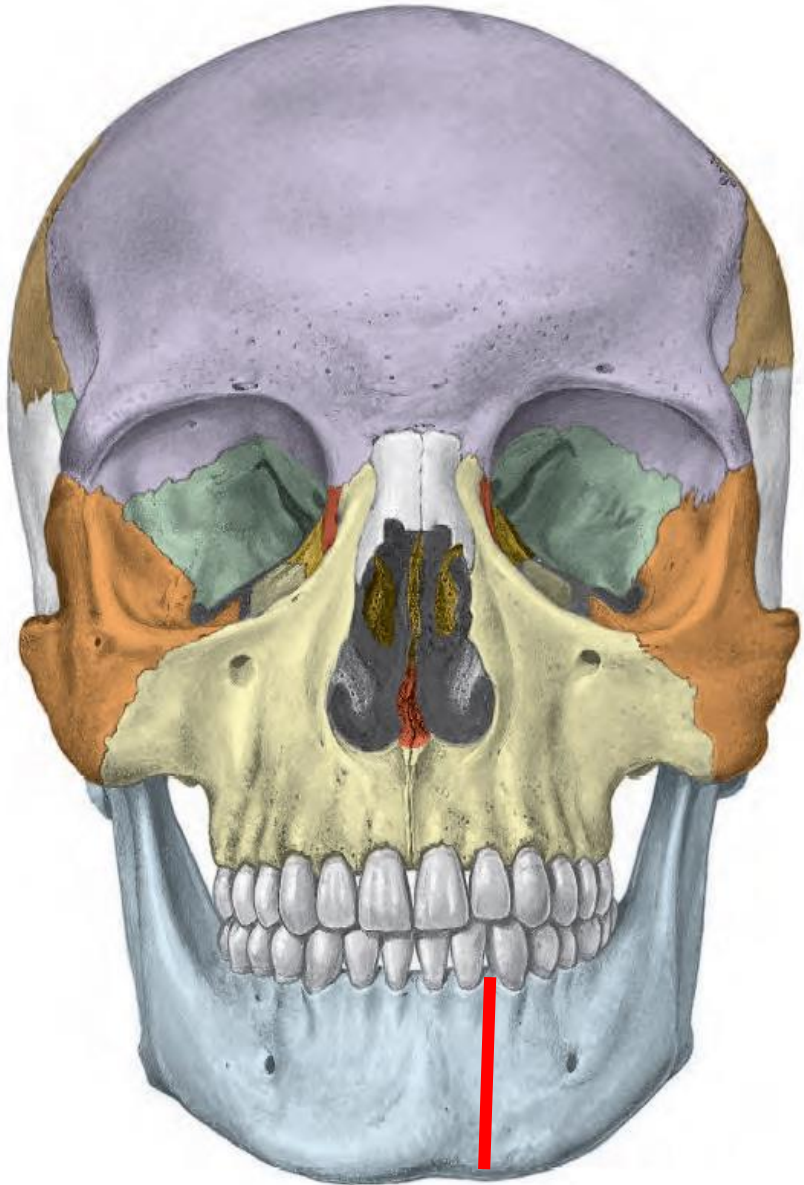






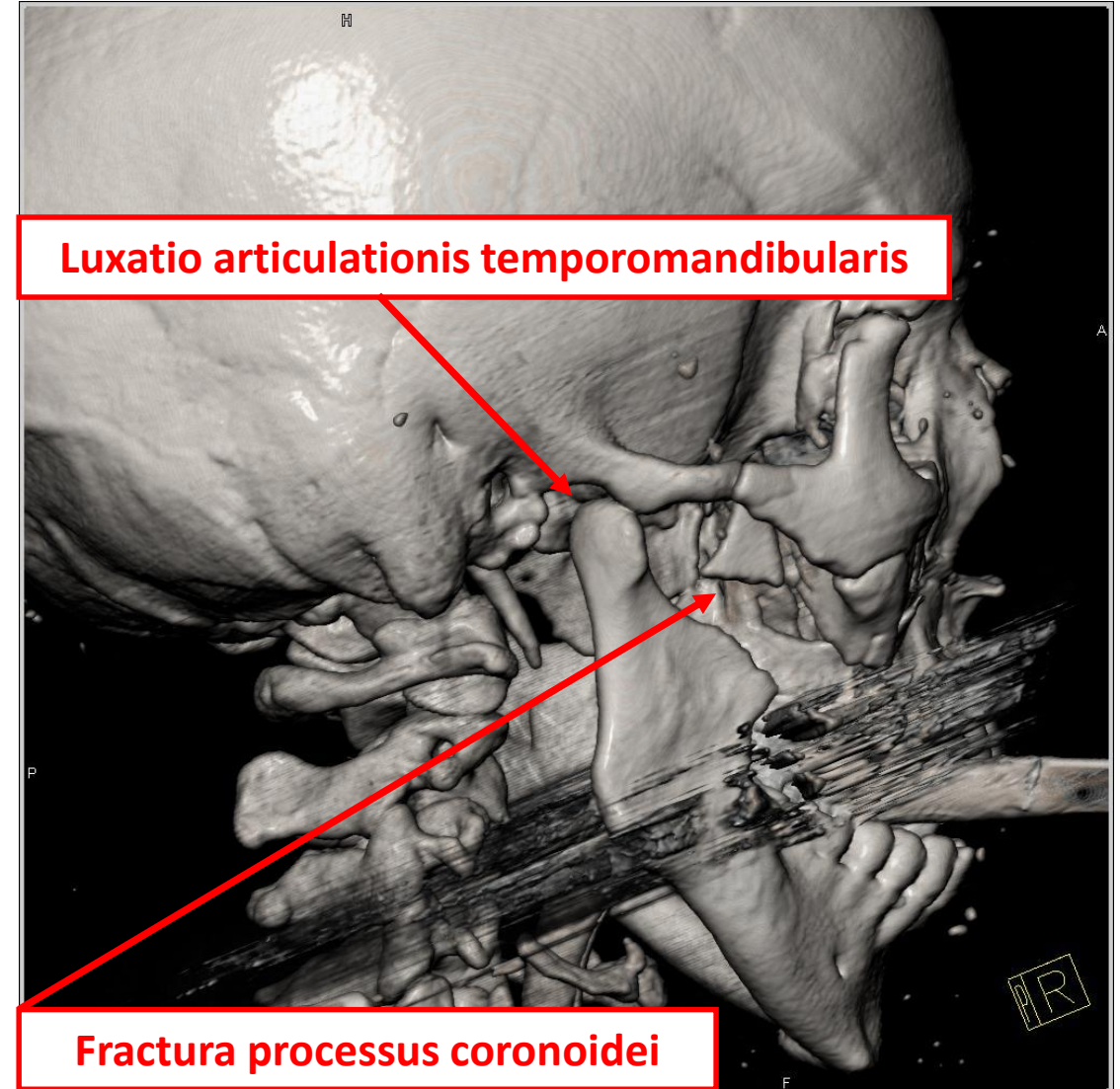
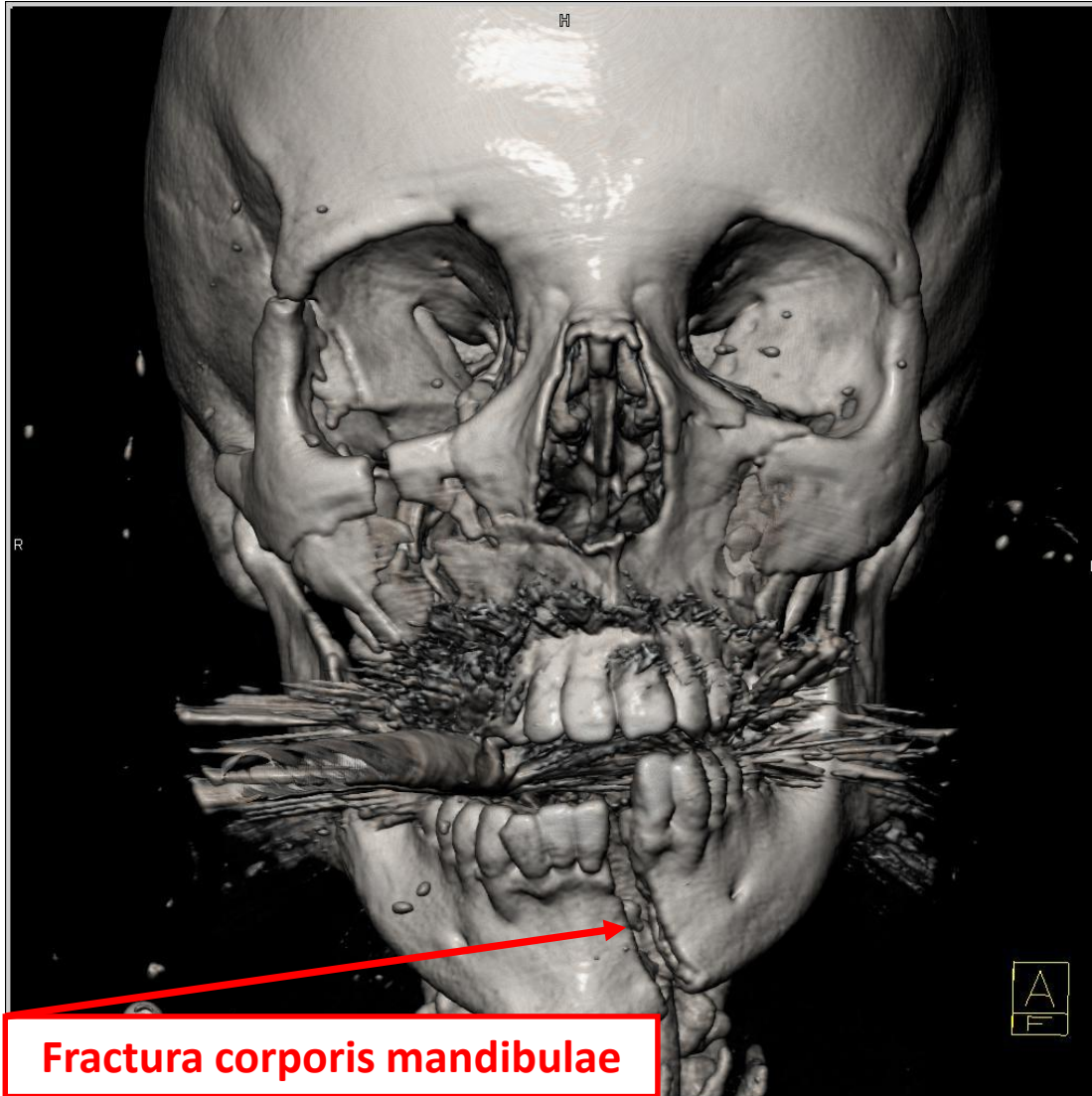


# Fracturae mandibulae





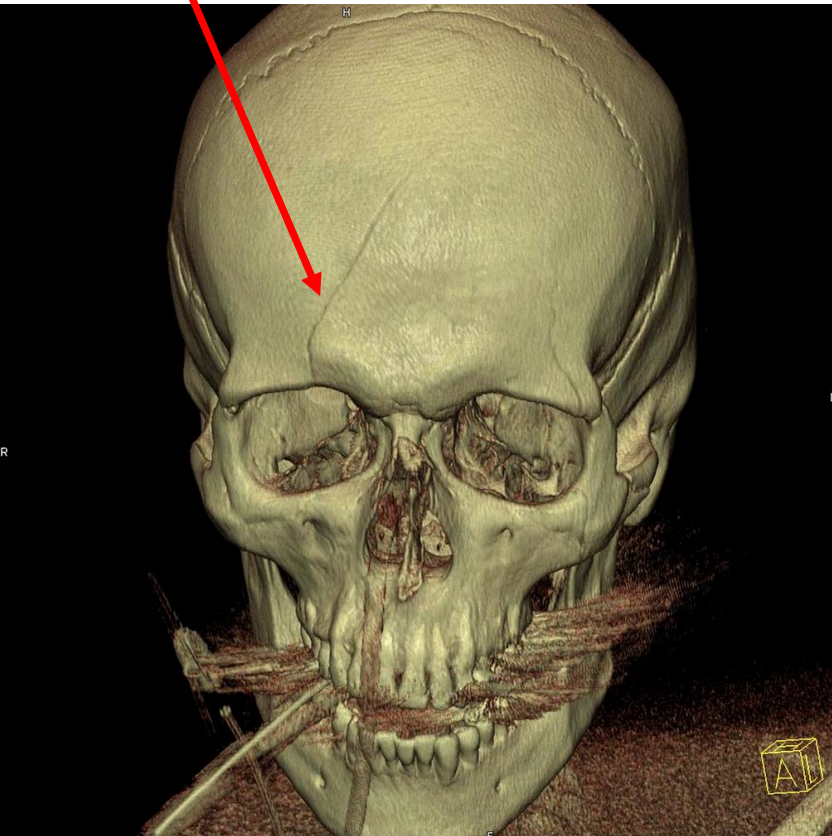
# Biomechanics of mandibular fracture



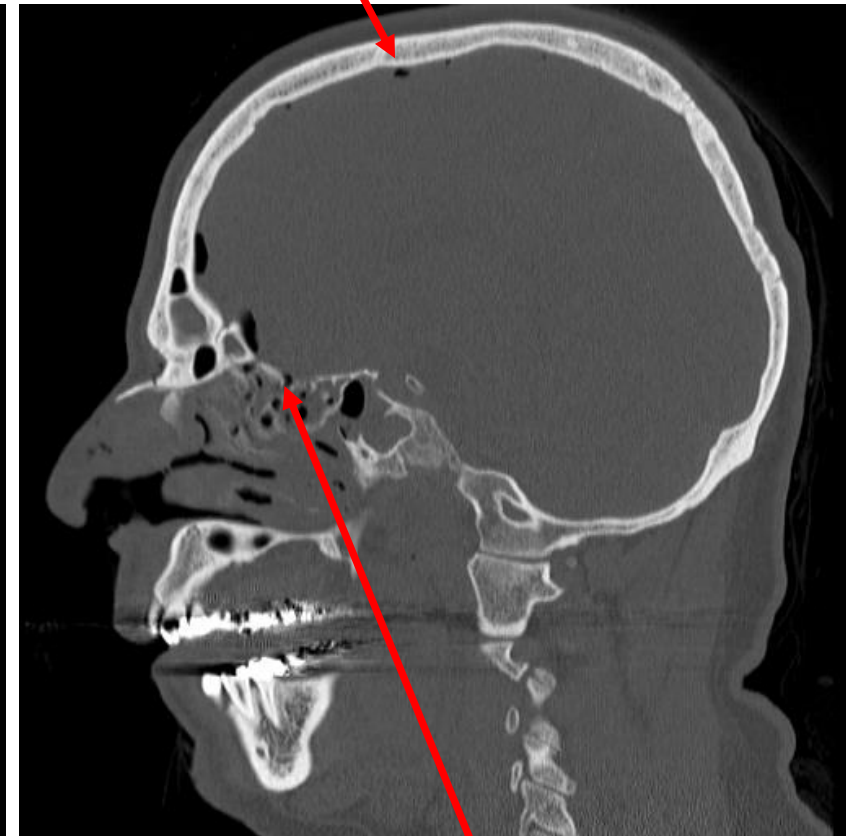
# Fr. sinus frontalis et laminae cribrosae + pneumocephalus

♦ Open fractures with air deposition in intracranial space - spread of infection

Fractura ossis frontalis



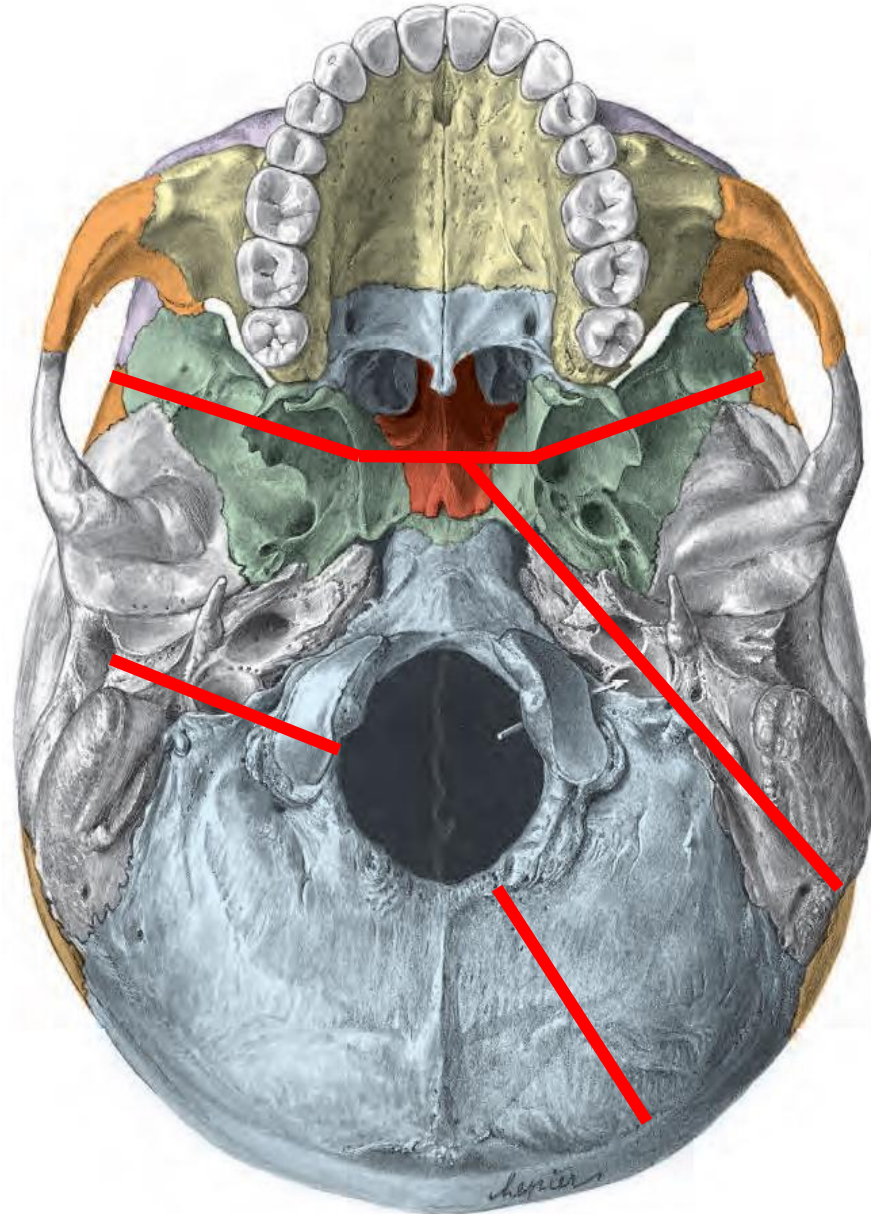
pneumocephalus



Fractura laminae cribrosae



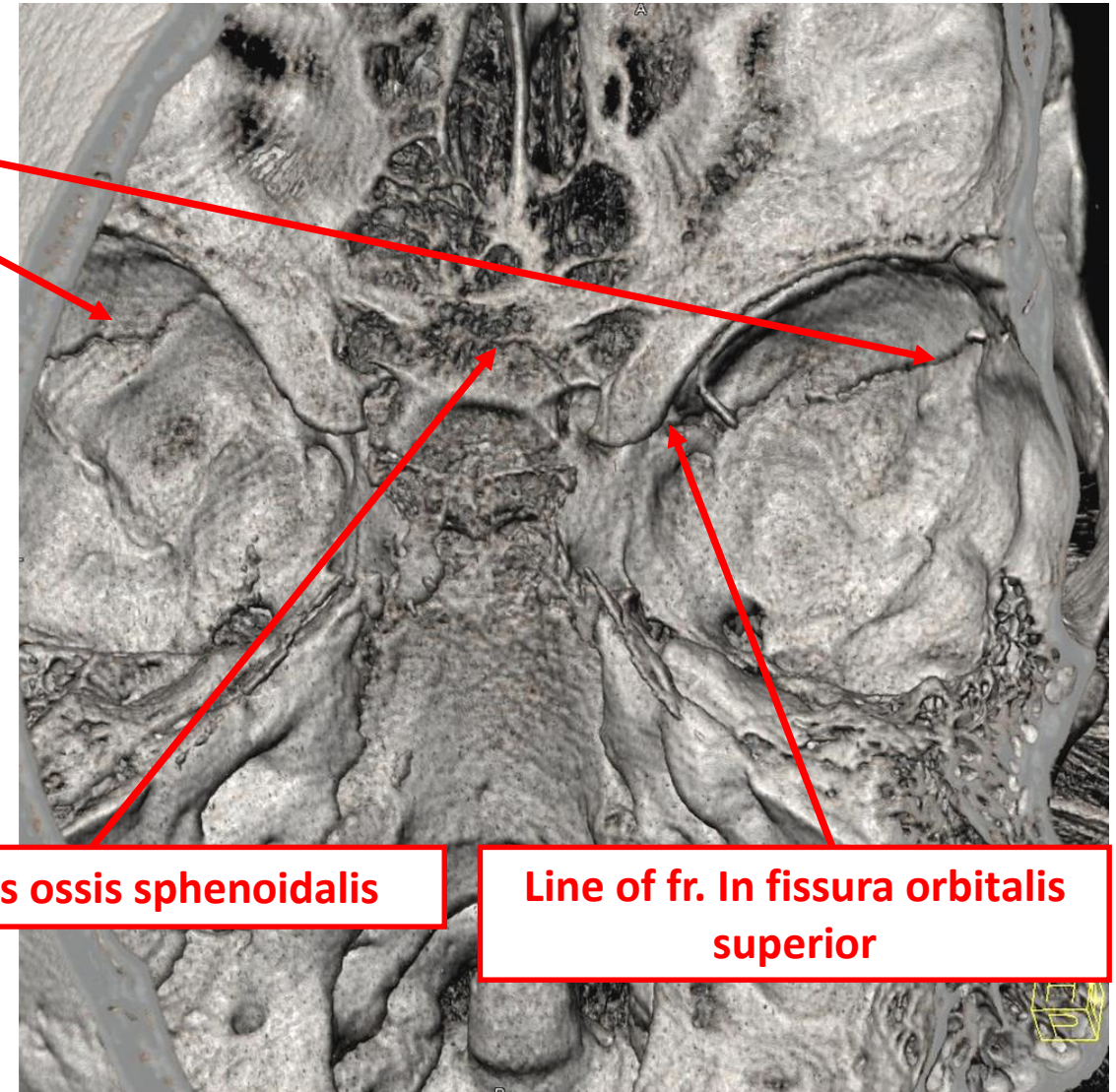
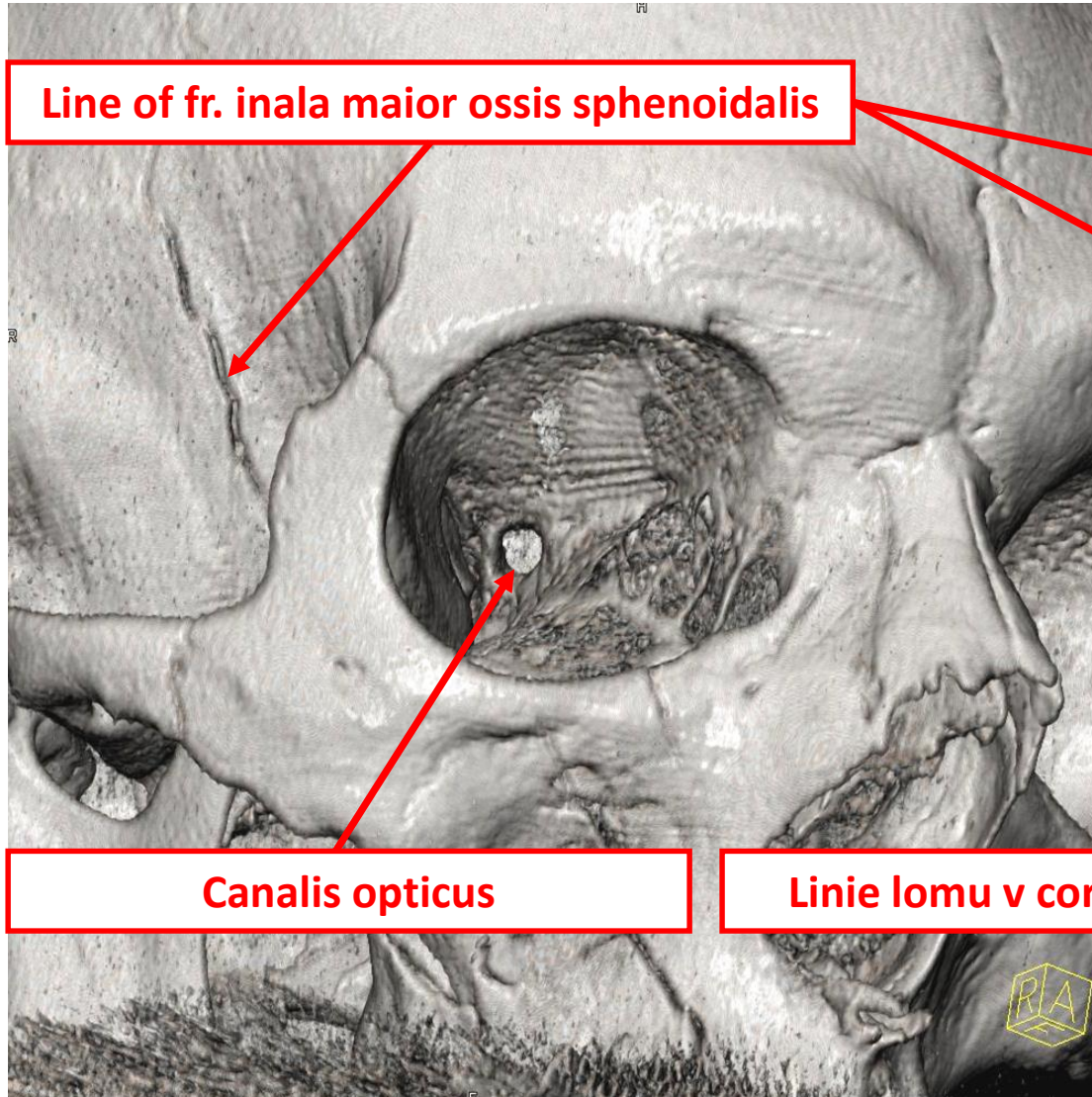
# Skull base fractures





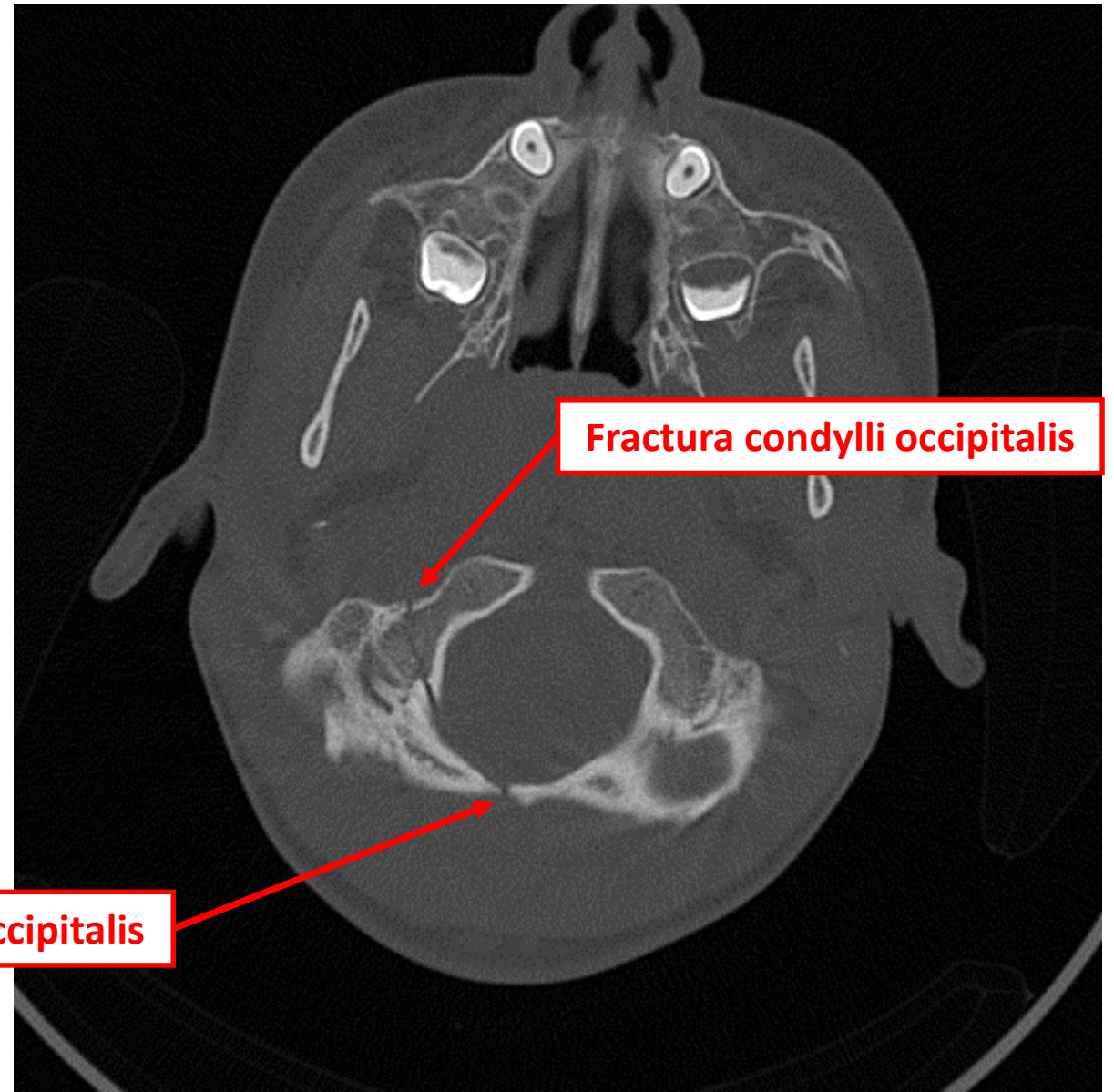
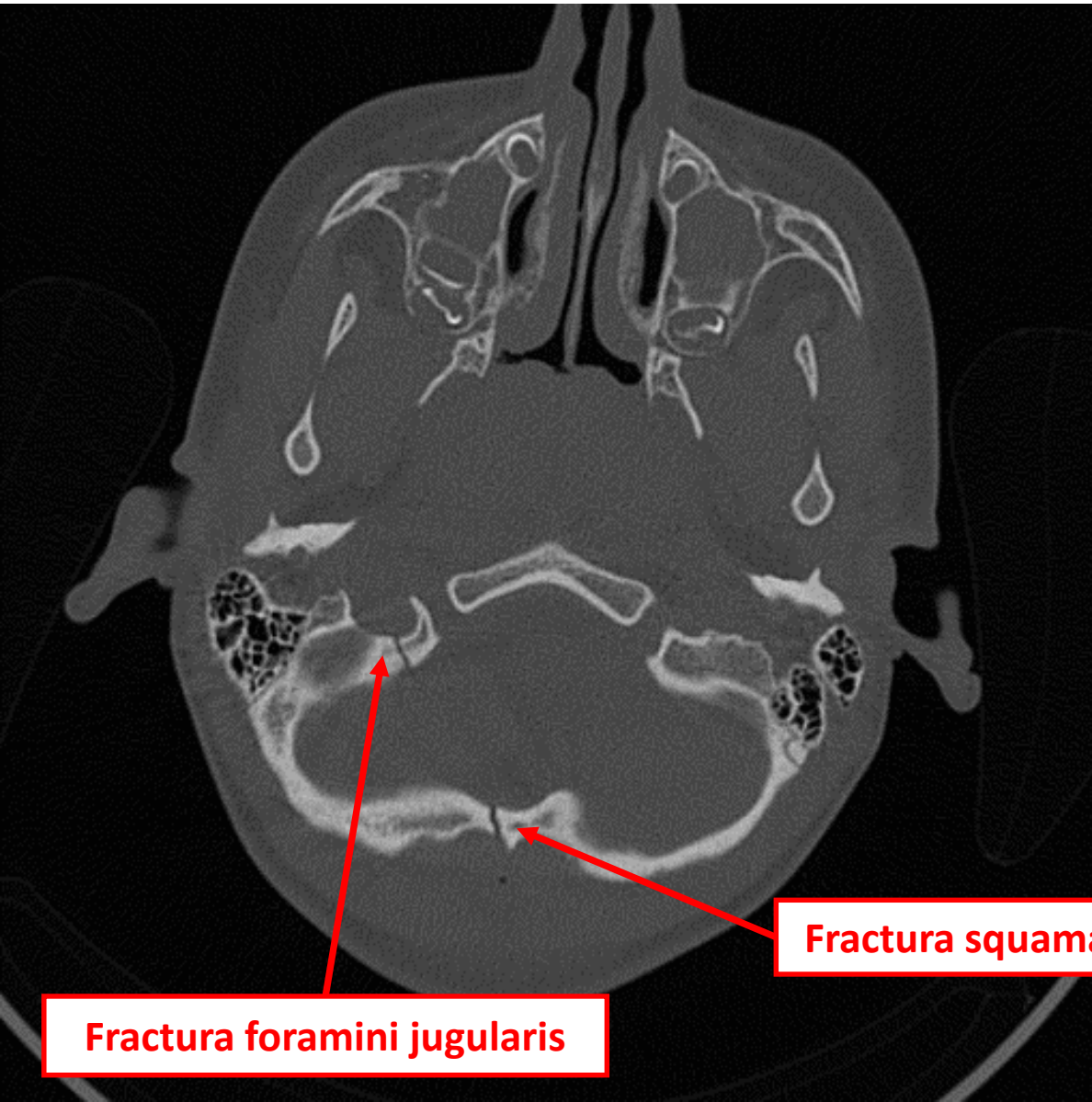
# Skull base fracture

- Right eye blindness due to the injury of the optic nerve

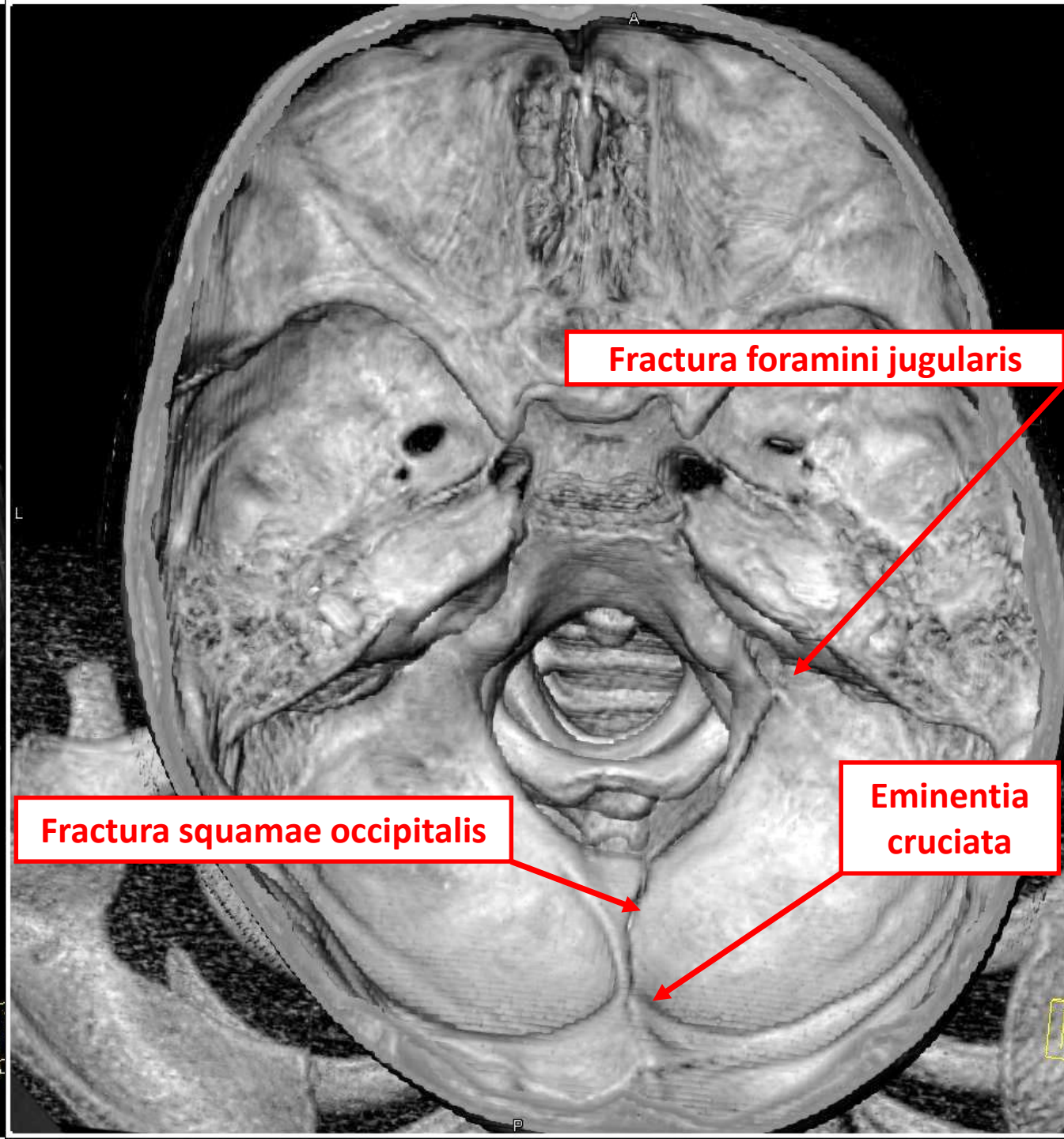
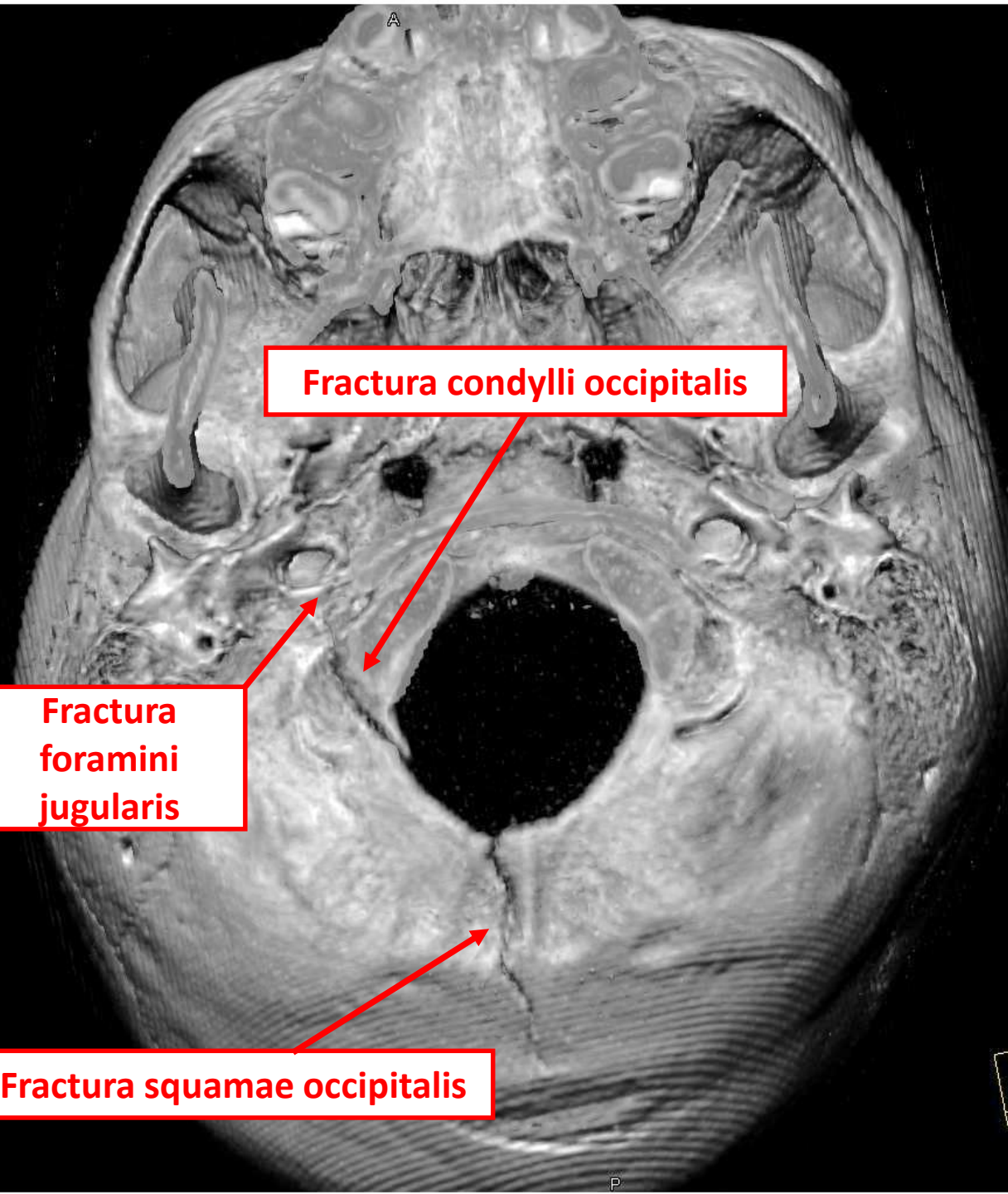




# Occipital bone fractures







# Clinical importance of menigeal spaces



# Meninges

## 💧 Dura mater

- 💧 *Covering from inside the skull bone*
- 💧 *Divides into lamina periostealis and lamina menigealis*

## 💧 Arachnoidea

- 💧 *Inner to dura mater*
- 💧 *Bridging veins*

## 💧 Pia mater

- 💧 *Covers surface of the brain*
- 💧 *Perivascular spaces invading brain tissue*

# Spatia meningealia

## 🔥 Spatium epidurale

- 🔥 *Between bone and lamina periostealis*

## 🔥 Spatium subdurale

- 🔥 *Mezi dura mater a arachnoideou*
- 🔥 *Or between two of laminae meningeales in falx cerebri or tentorium cerebelli*

## 🔥 Spatium subarachnoidale

- 🔥 *between arachnoideou and pia mater*

## 🔥 Spatium subpiale

- 🔥 *between pia mater and brain tissue*



# Spatia meningealia - physiological content

## 💧 Spatium epidurale

- 💧 *Nothing*
- 💧 *Impresses of meningeal arteries*

## 💧 Spatium subdurale

- 💧 *Nothing*
- 💧 *Impresses of dural sinuses*

## 💧 Spatium subarachnoidale

- 💧 *Contains liquor cerebrospinalis and leptomeningeal arteries and veins*

## 💧 Spatium subpiale

- 💧 *contains liquor cerebrospinalis in perivascular spaces spatia Robini-Virchowii*

# Spatia meningealia - pathological content

## 💧 Spatium epidurale

- 💧 *Epidural haematoma - injury of meningeal artery*
- 💧 *Epidural absces - spread of infection from mastoid process cellulae or from frontal sinus*

## 💧 Spatium subdurale

- 💧 *Subdural ehmatoma from bridging vins*
- 💧 *Subdoral empyema - spreading infection from mastoid process cellulae or from frontal sinus*

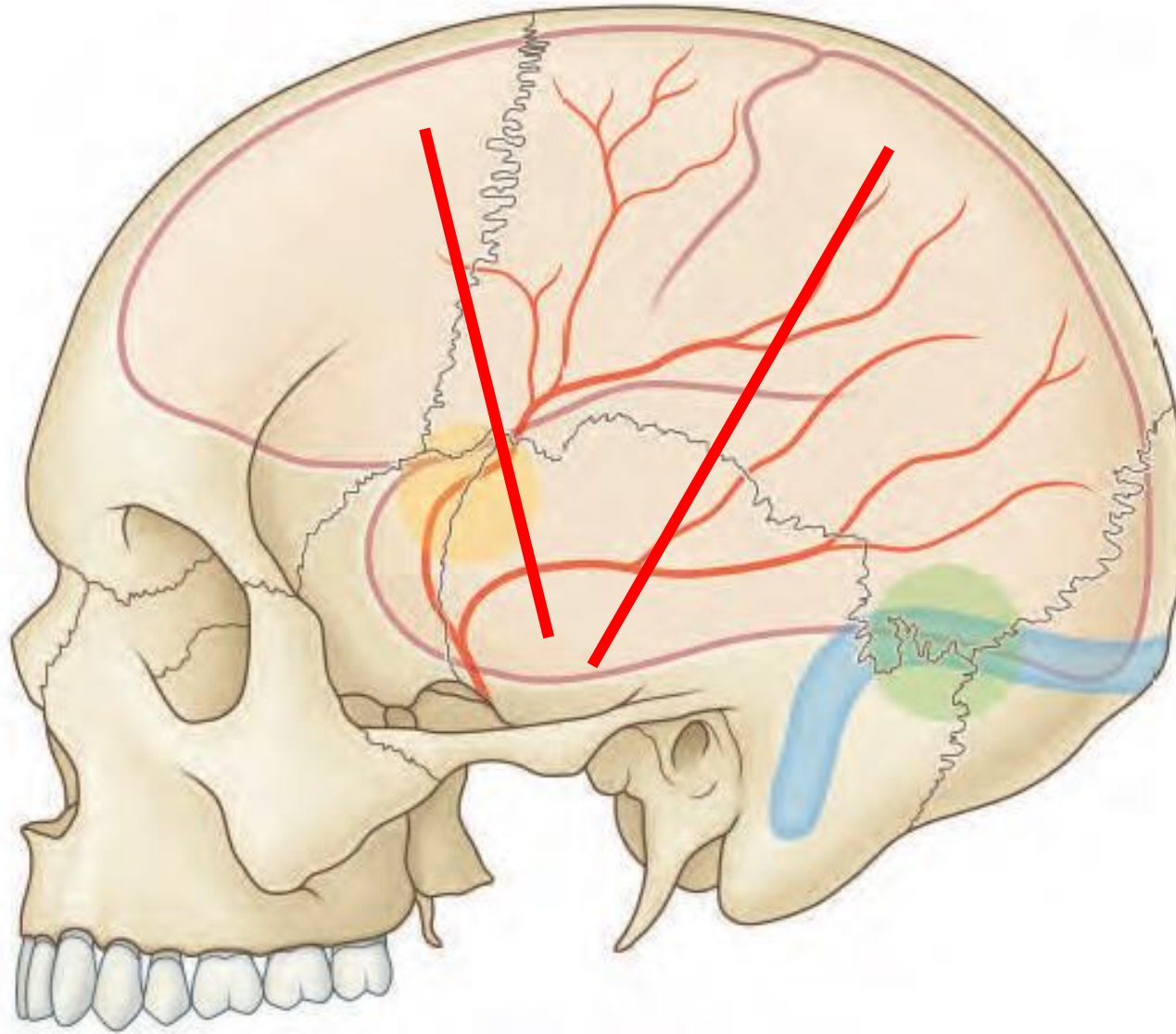
## 💧 Spatium subarachnoidale

- 💧 *Subarachnoideal bleeding - injury, rupture of an anyeuryzm*
- 💧 *Leptomenngeal spread of tumor through pia mater*
- 💧 *Leptomeningela spread od infection or inflammation*

## 💧 Spatium subpiale

- 💧 *Perivascualr infalmmation, haematogenous spread of metastases*

# Haematoma epidurale et a. meningea media

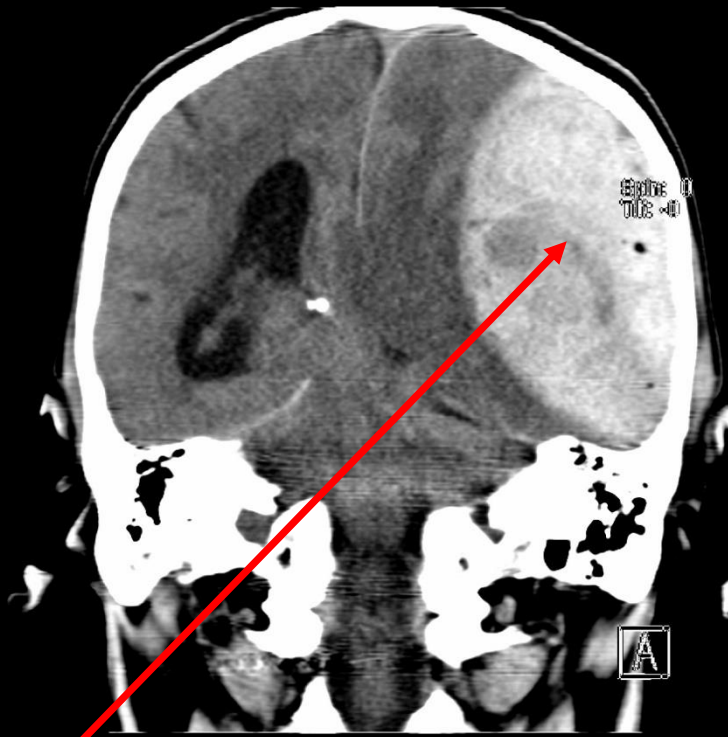




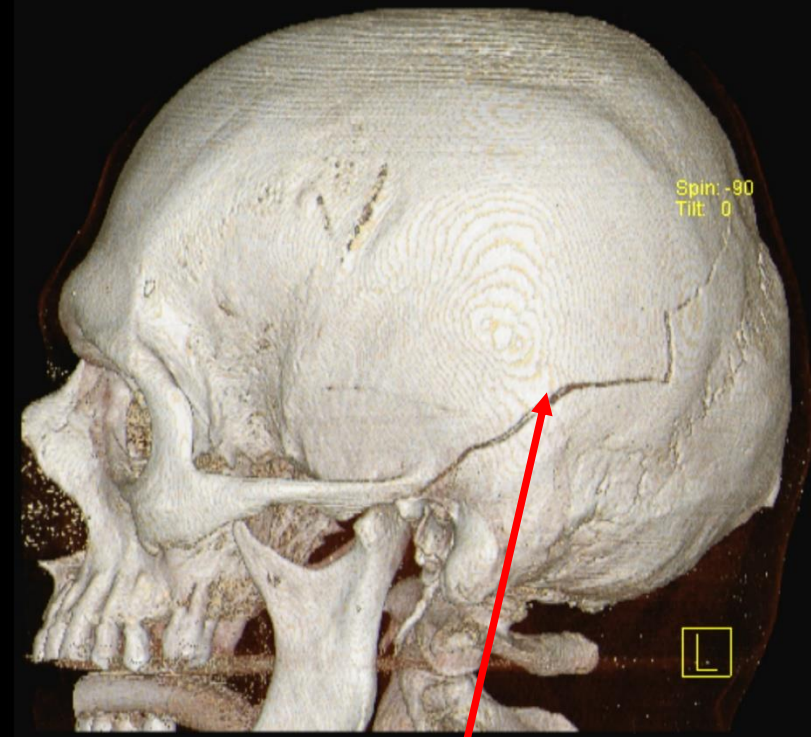
# Haematoma epidurale

- ♦ injury a. meningea media - fractura ossis temporalis - squama
- ♦ *Brain stem compression*

Compressio mesencephali

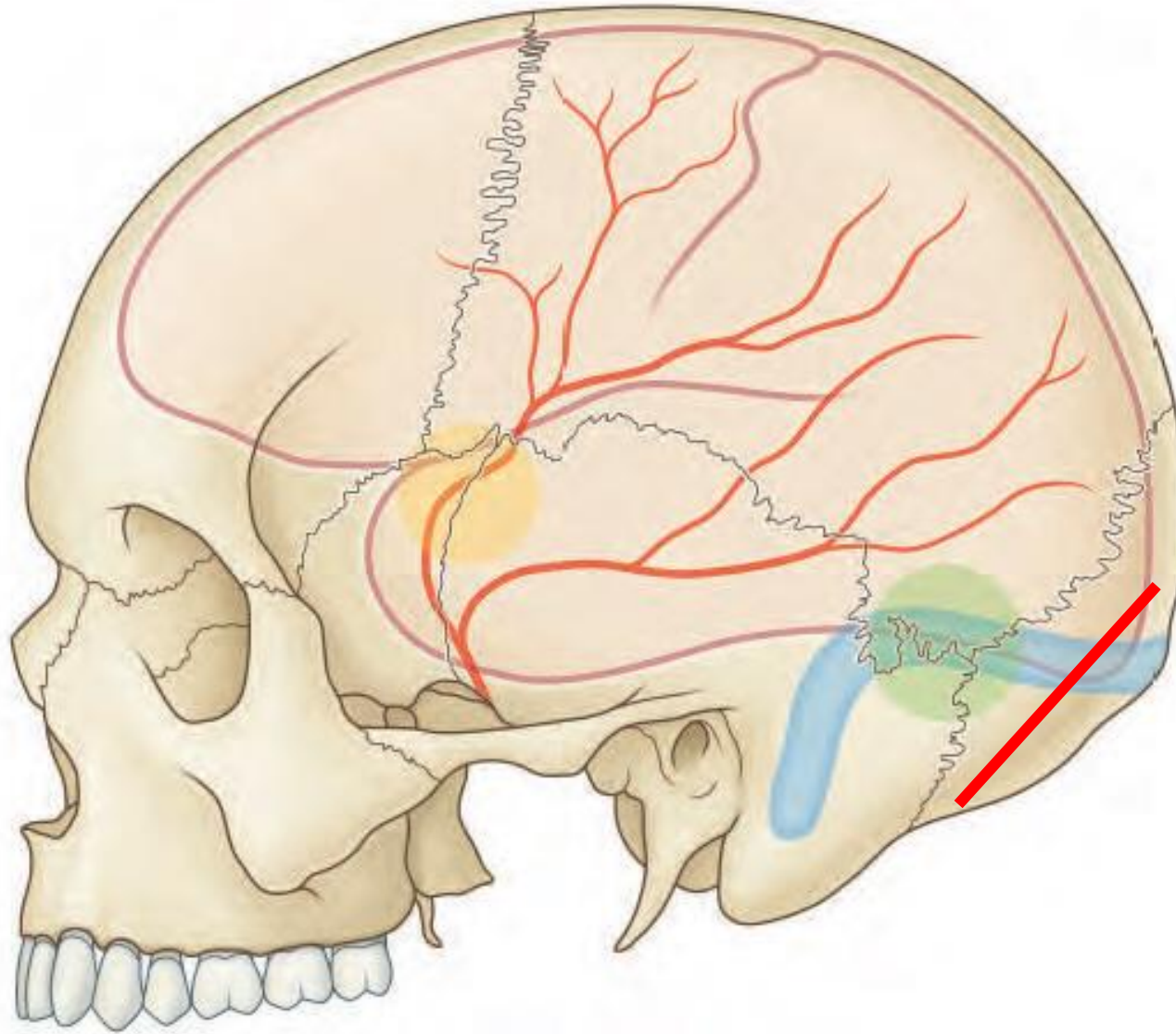


Haematoma epidurale EDH

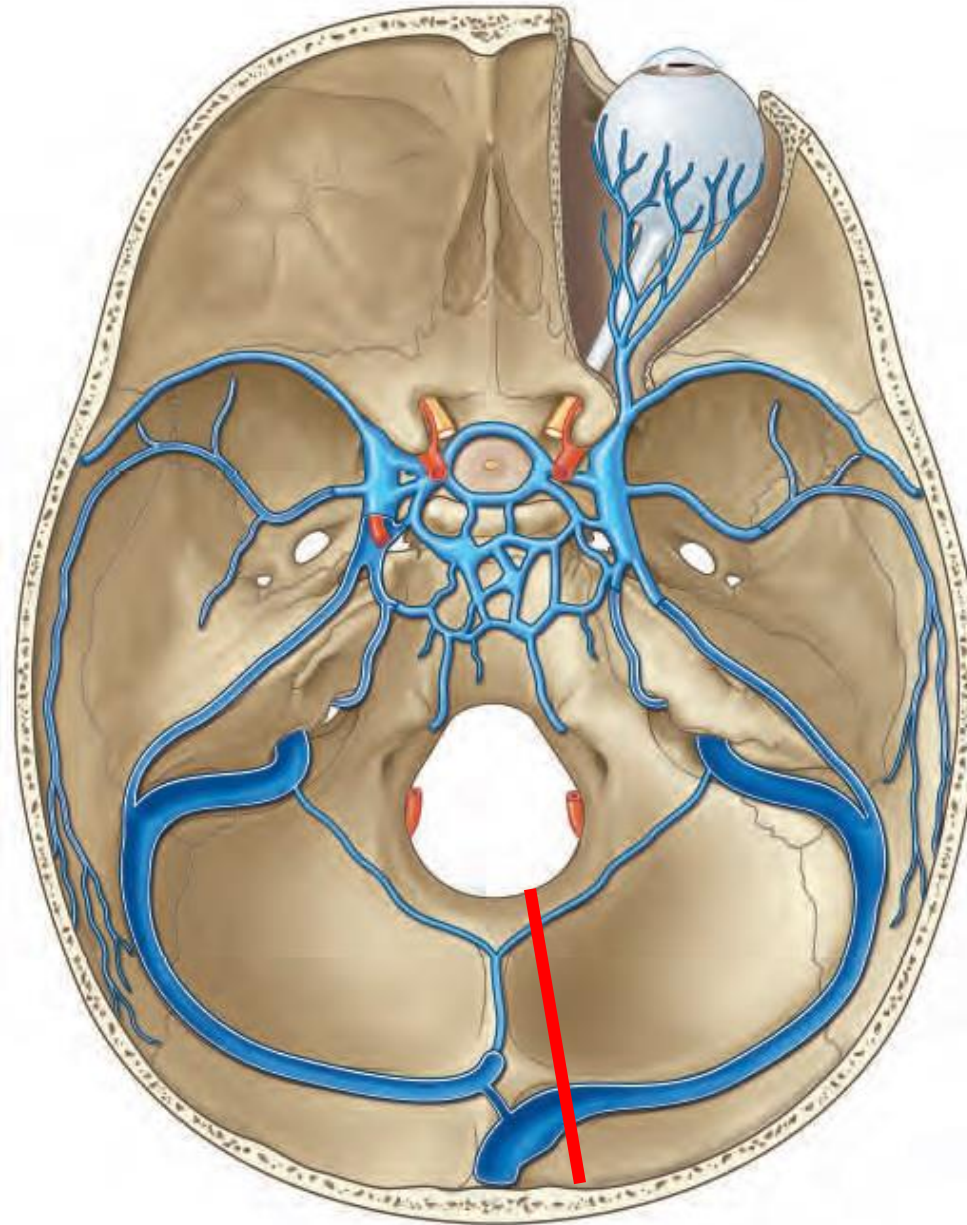


Fractura ossis temporalis

# Haematoma epidurale et sinus duralis



# Haematoma epidurale et sinus duralis

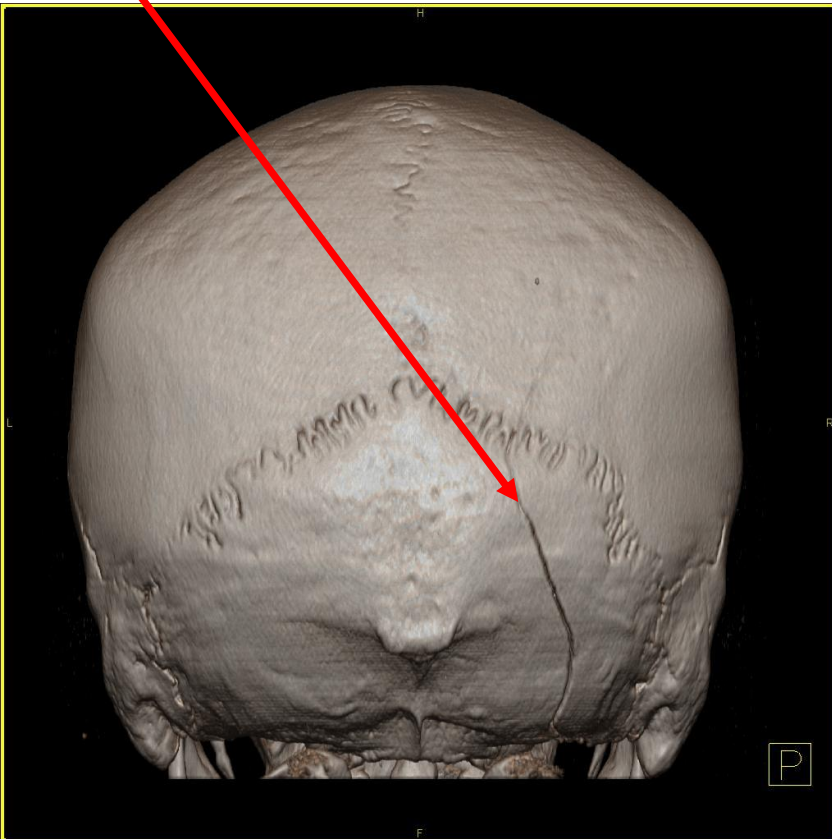




# Haematoma epidurale

- ♦ injured sinus transversus - fractura squamae occipitalis

Fractura ossis occipitalis

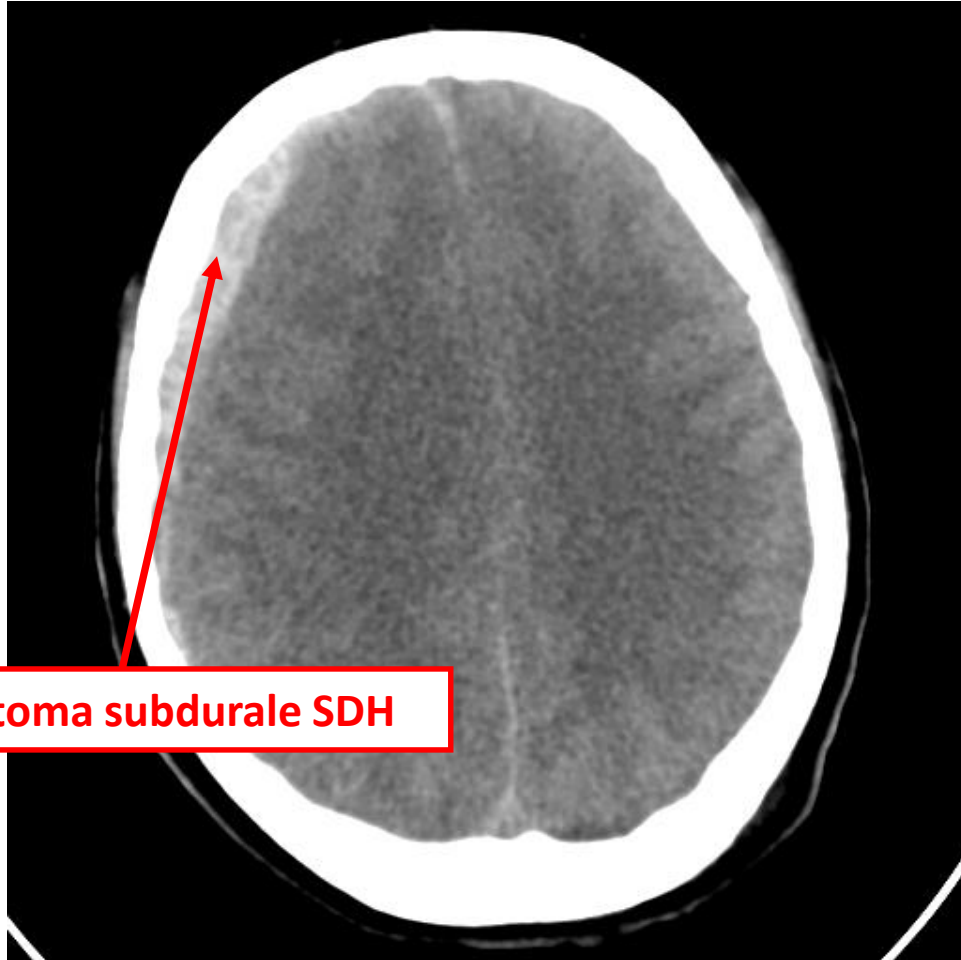


injury sinus transversus



# Haematoma subdurale

💧 Injury of bridging veins, no injury of skeleton!

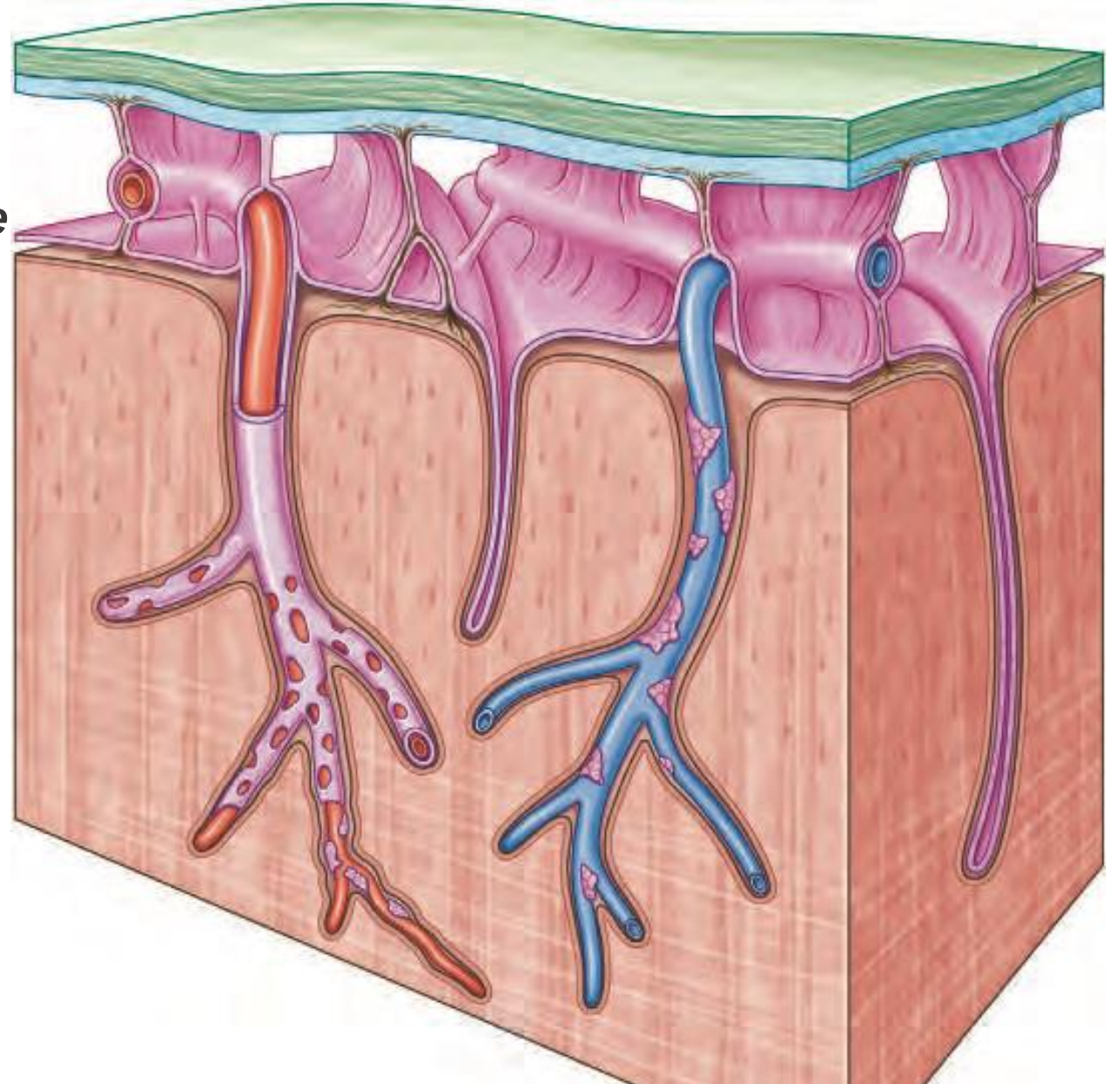


Haematoma subdurale SDH



# Subarachnoid space

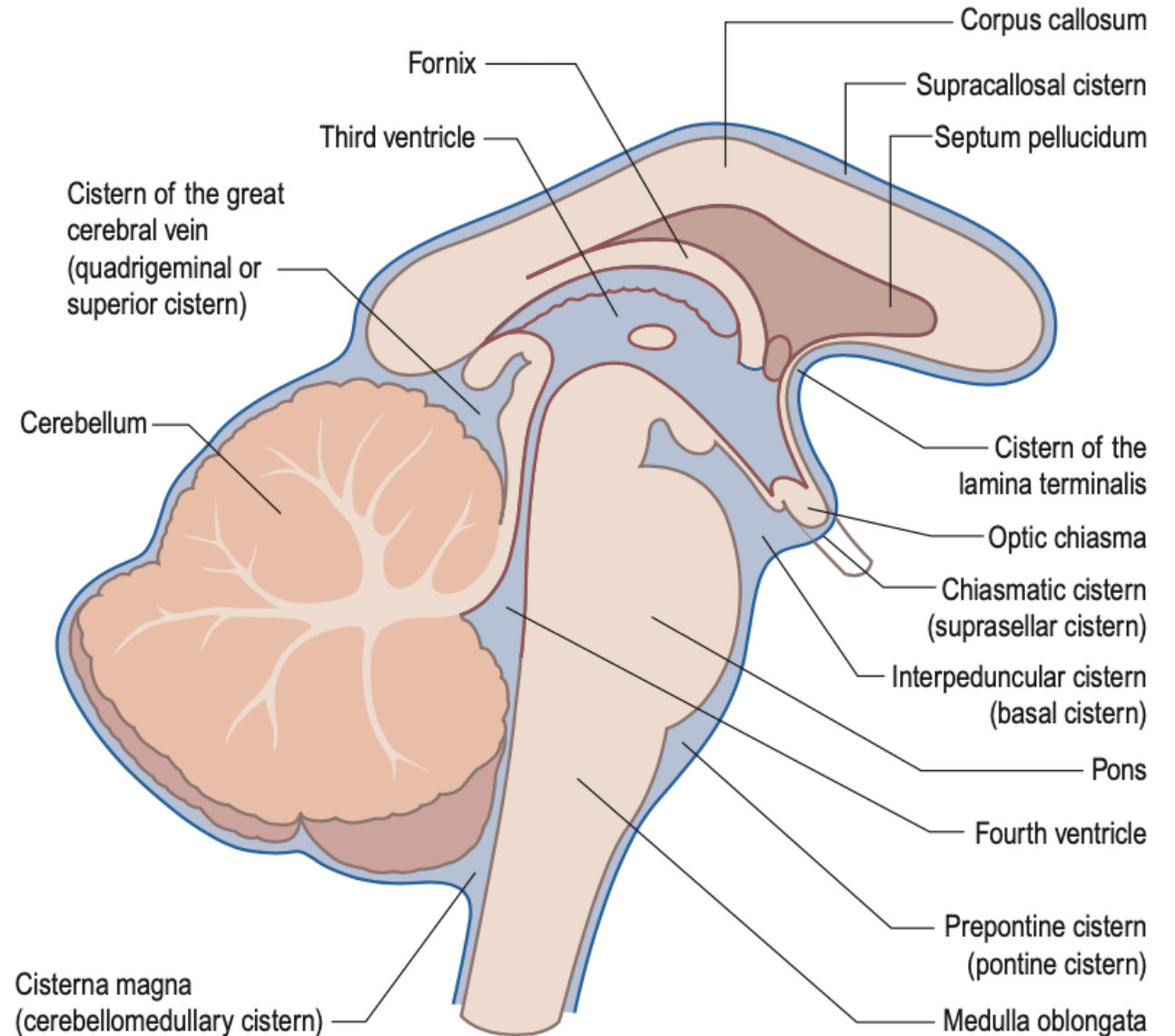
- ♦ Space out of CNS
- ♦ *between pia mater and arachnoidea*
- ♦ *Circulation of liquor from ventricular space*
- ♦ *Motion caused by pulsation of brain*



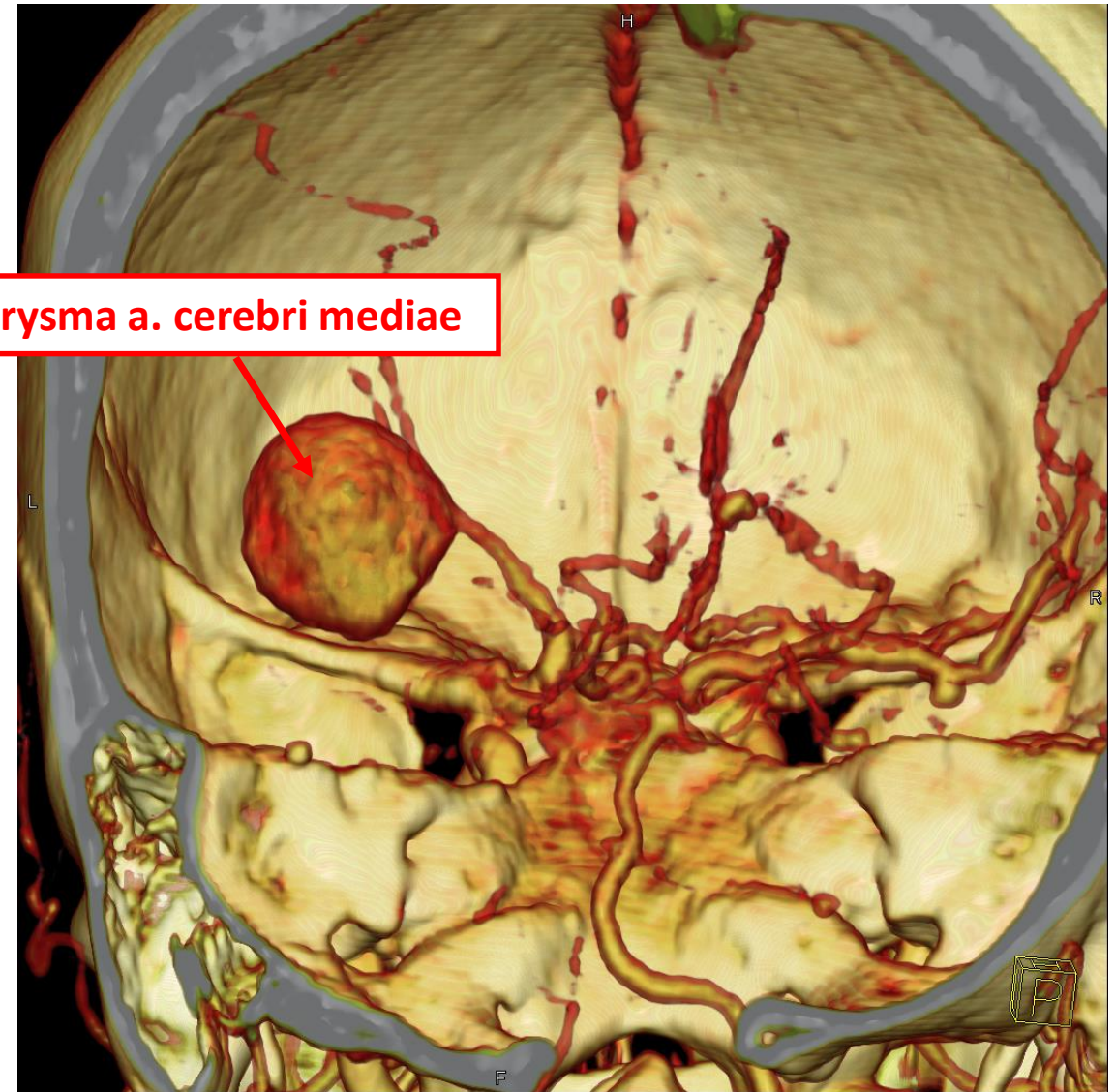
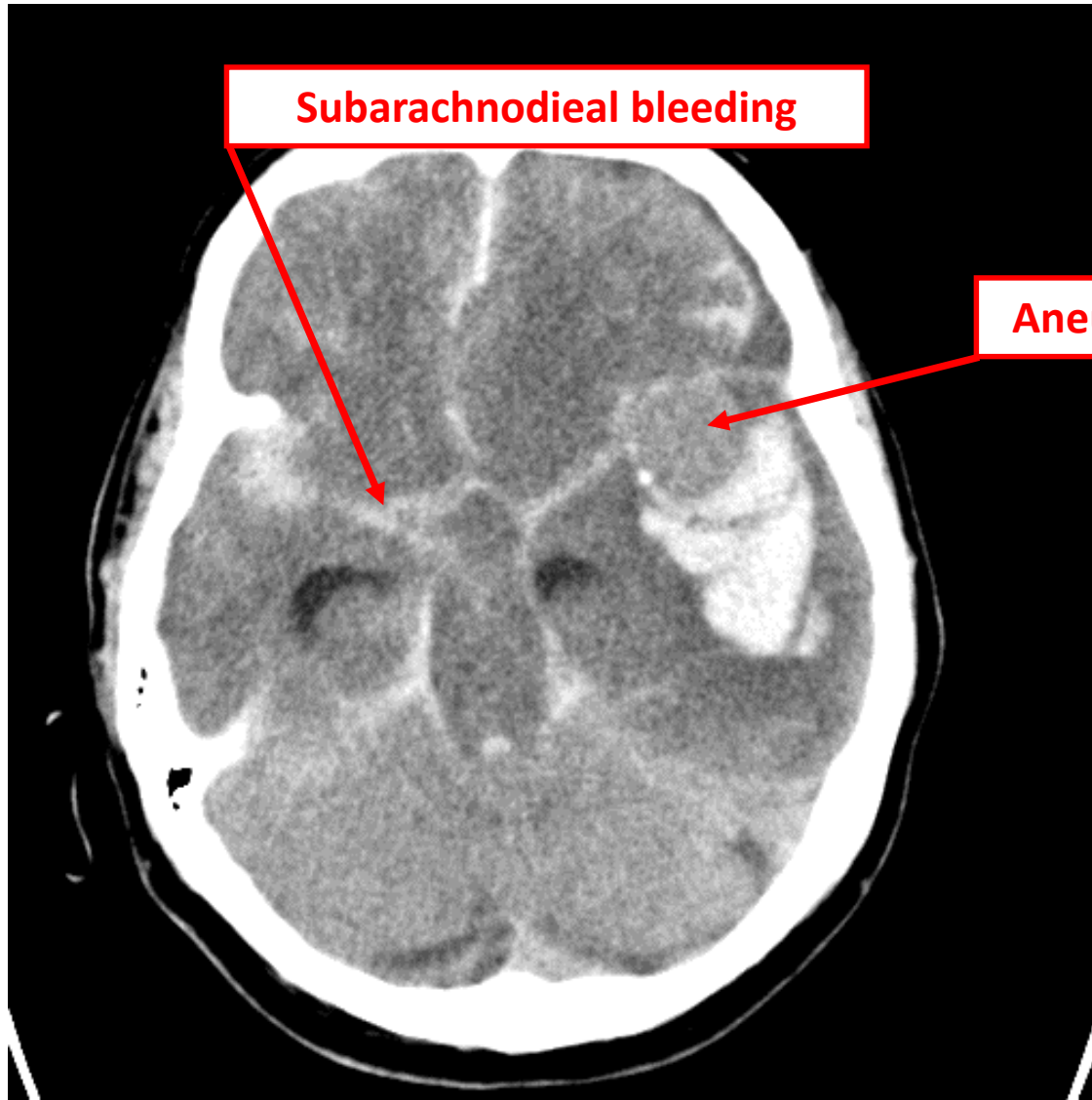


# Cisterns

- **Cisterna magna (cerebelli, cerebellomedullaris)**
- **Cisterna premedullaris**
- **Cisterna prepontina**
- **Cisterna cerebellopontina**
- **Cistern vermiana superior**
- **Cisterna interpeduncularis (basalis) (anterior)**
- **Cisterna cruralis (anterolateras)**
- **Cisterna ambiens (laterodorsal)**
- **Cisterna v. magnae (quadrigeminalis)**
- **Cisterna chiasmatica (suprasellar)**
- **Cisterna laminae terminalis**
- **Cisterna pericallosa**
- **Cisterna velli interpositi**
- **Cisterna fossae Sylvii**

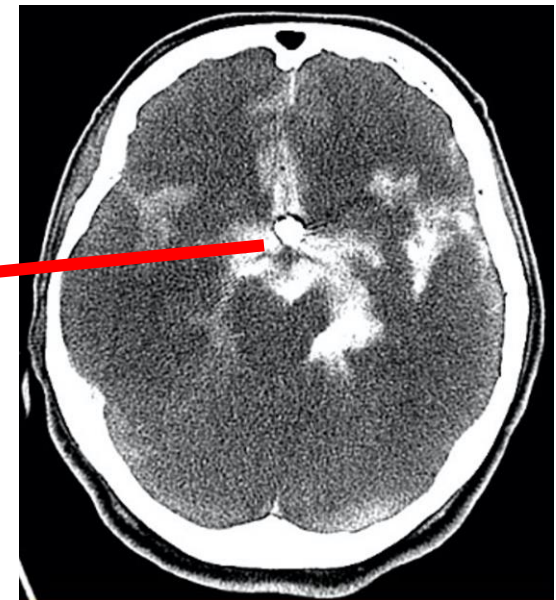
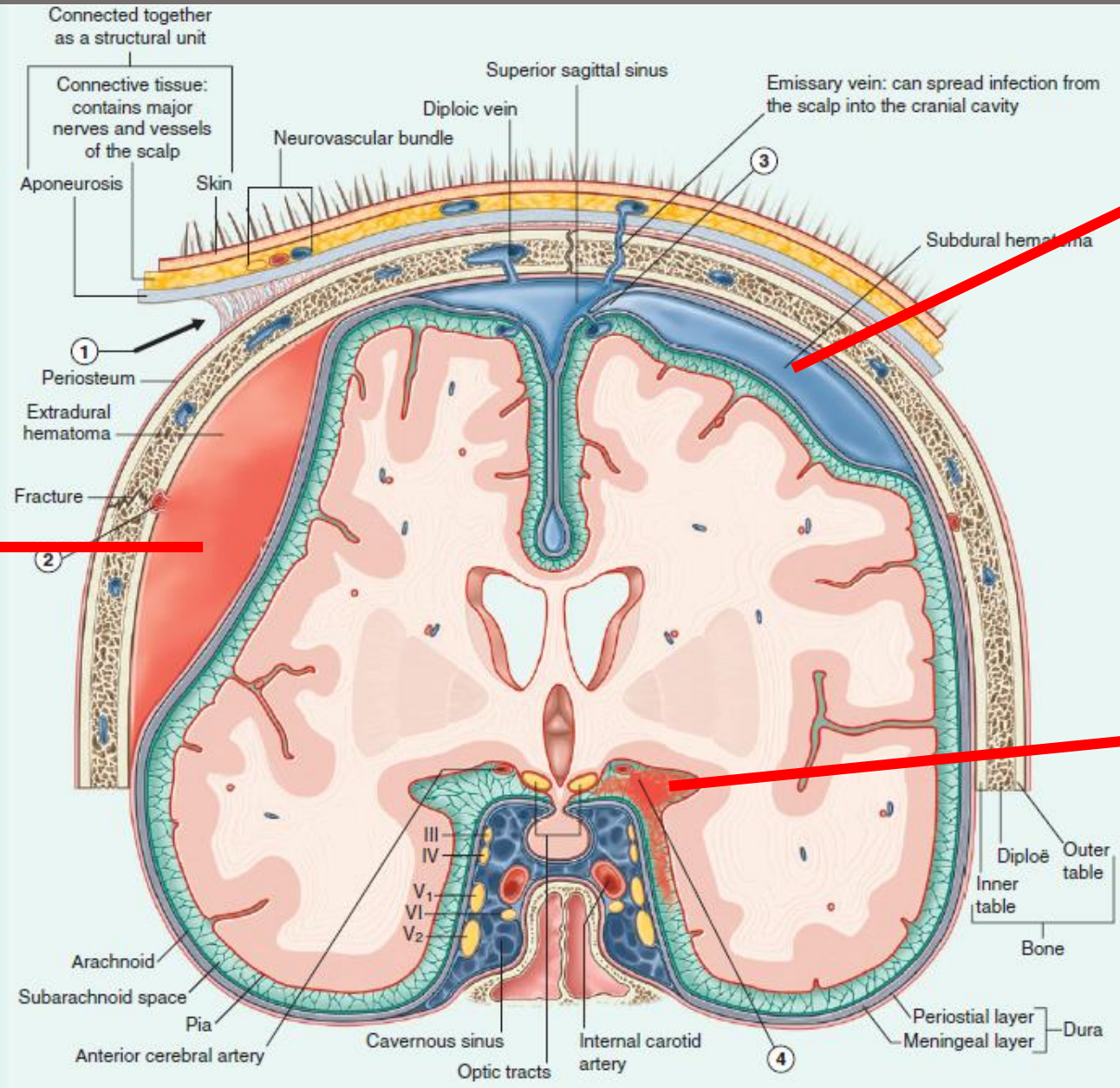


# Subarachnoidal bleeding from aneurysm of a. cerebri media





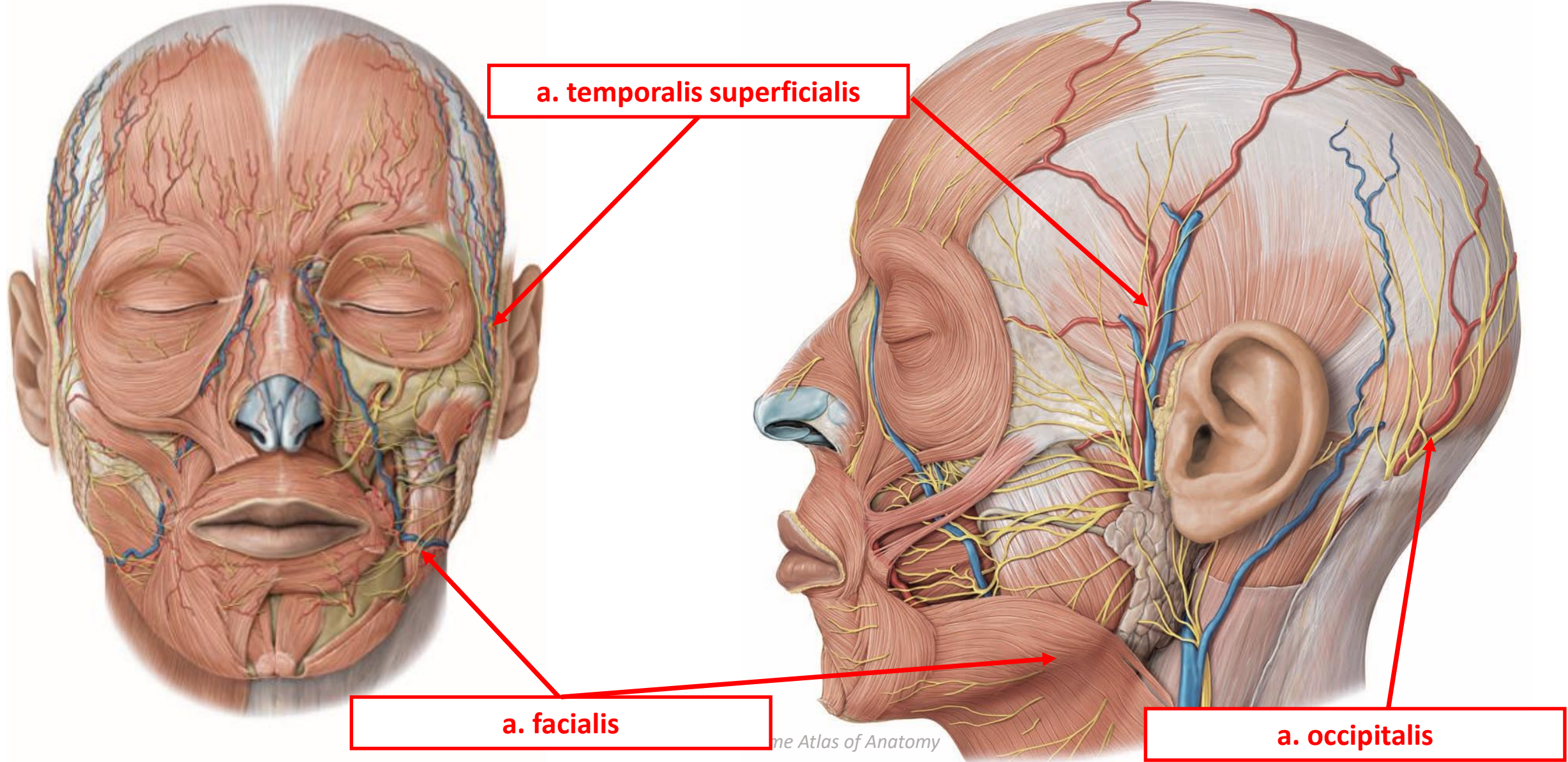
# Synopsis of intracranial bleeding





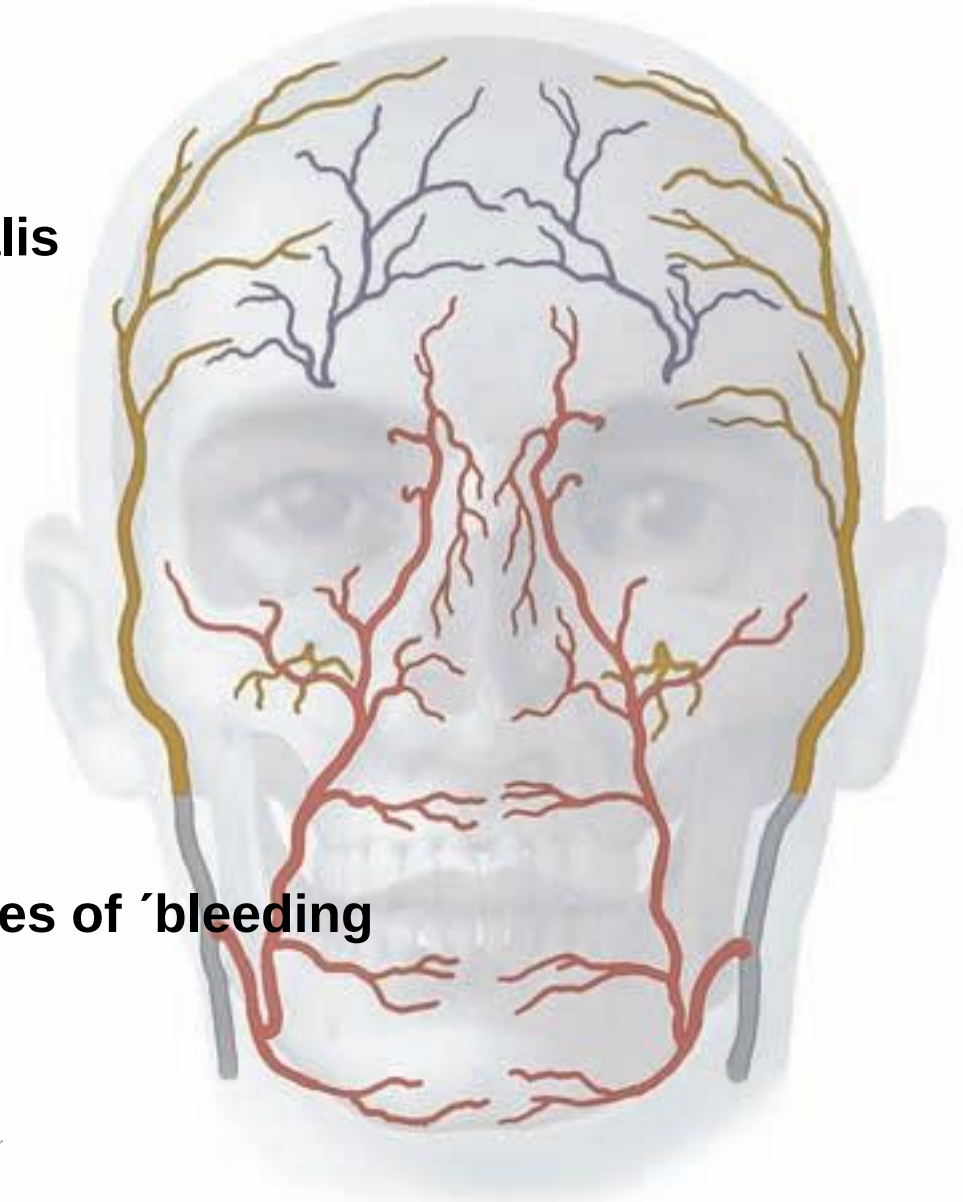
# Clinical impact of anatomy of vessels, nerves and lymphatics of head and neck

# Palpation of arteries



# Territorial anastomoses

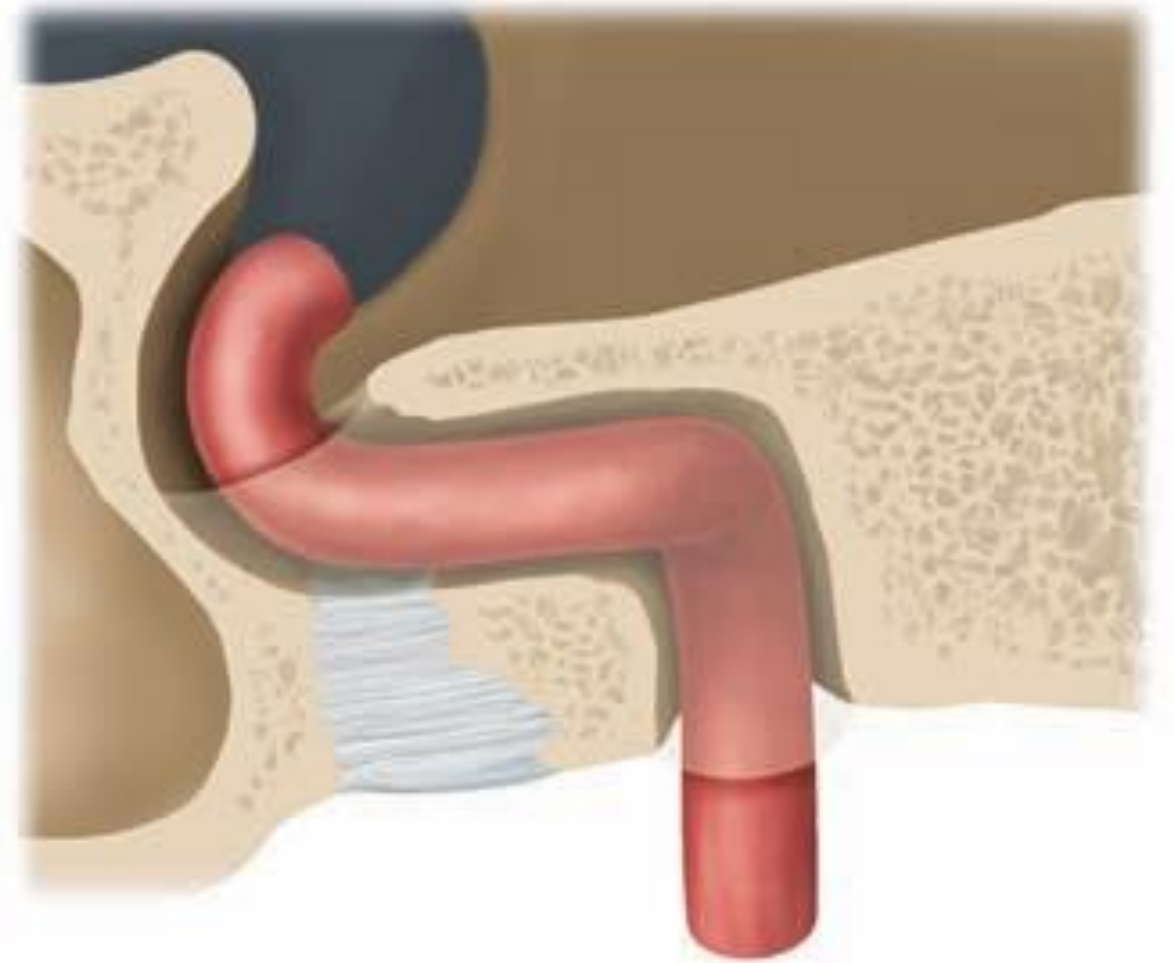
- ♦ **Colaterals to intracranial territory**
- ♦ **A. supraorbitalis - a. temporalis superficialis**
  - ♦ Between a. ophtalmica and a. temporalis superficialis
  - ♦ Between a. carotis interna and externa
- ♦ **A. angularis - a. supratrochlearis**
  - ♦ Between a. facialis and a. ophtalmica
  - ♦ Between a. carotis interna and a. carotis externa
  - ♦ Important collateral to intracranial space
    - ♦ In occlusion of a. carotis interna
- ♦ **Left to right colaterals**
  - ♦ surgery
  - ♦ Ligatures must be done to close all available sources of 'bleeding'





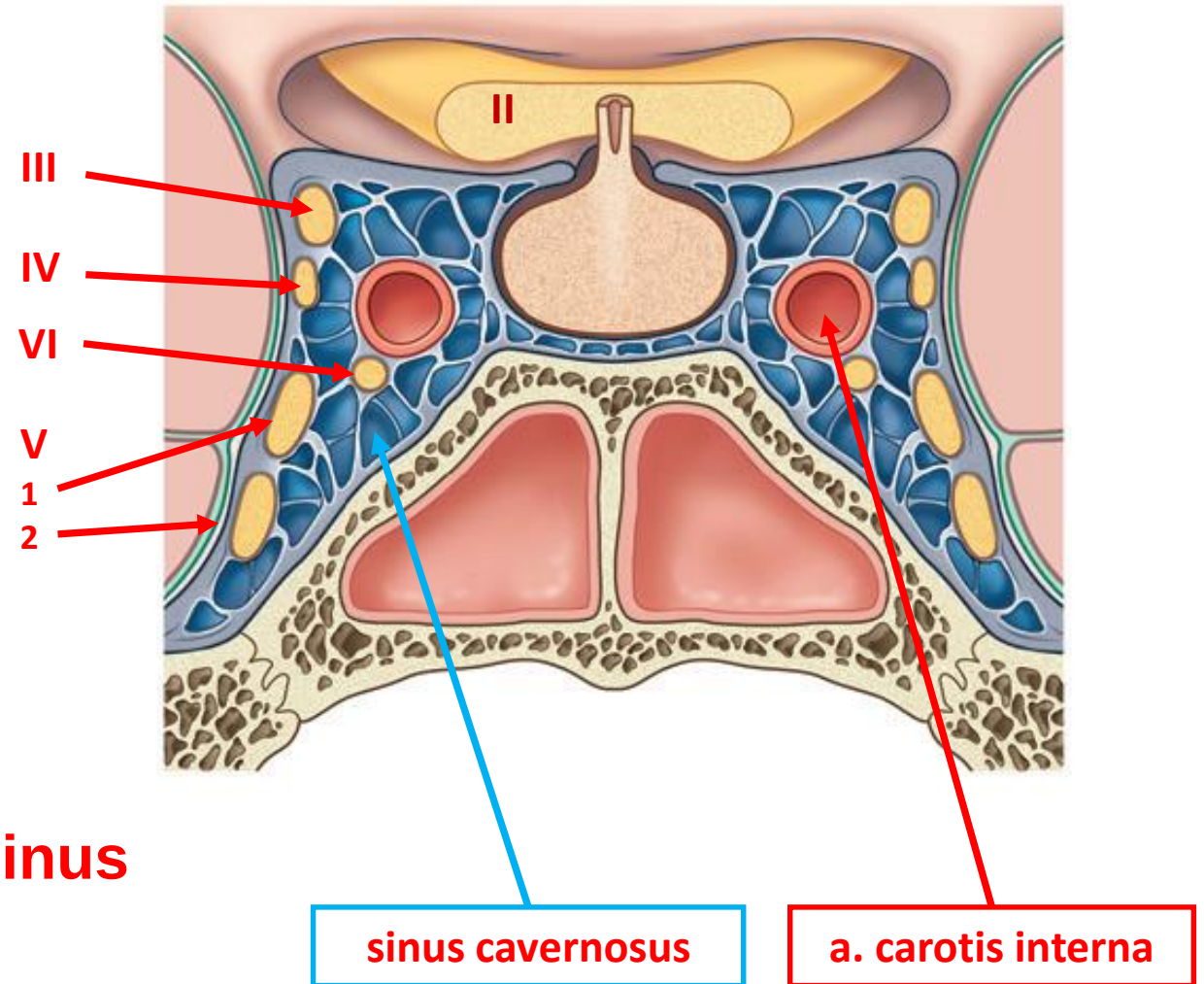
## a. carotis interna

- ♦ Pars cavernosa
- ♦ injury
- ♦ ARTERIOVENOUS SHUNT
- ♦ Carotidocavernous fistula
- ♦ Overfilled orbital veins
- ♦ Bulb's protrusion
- ♦ Conjunctiva- chemosis



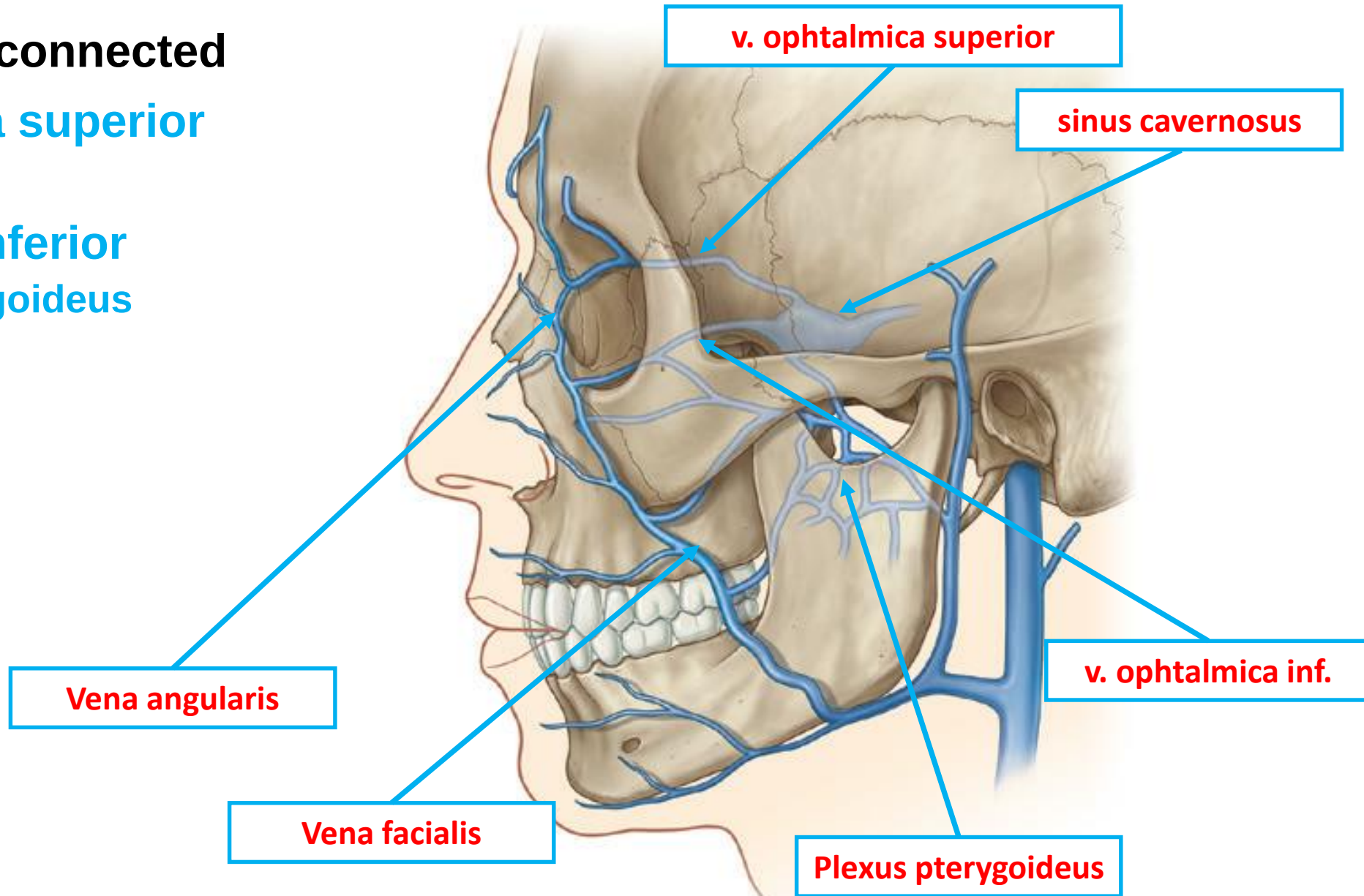
# a. carotis interna

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  - ♦ Conjunctiva- chemosis
- 
- ♦ Impairment of nerves in cavernosus sinus



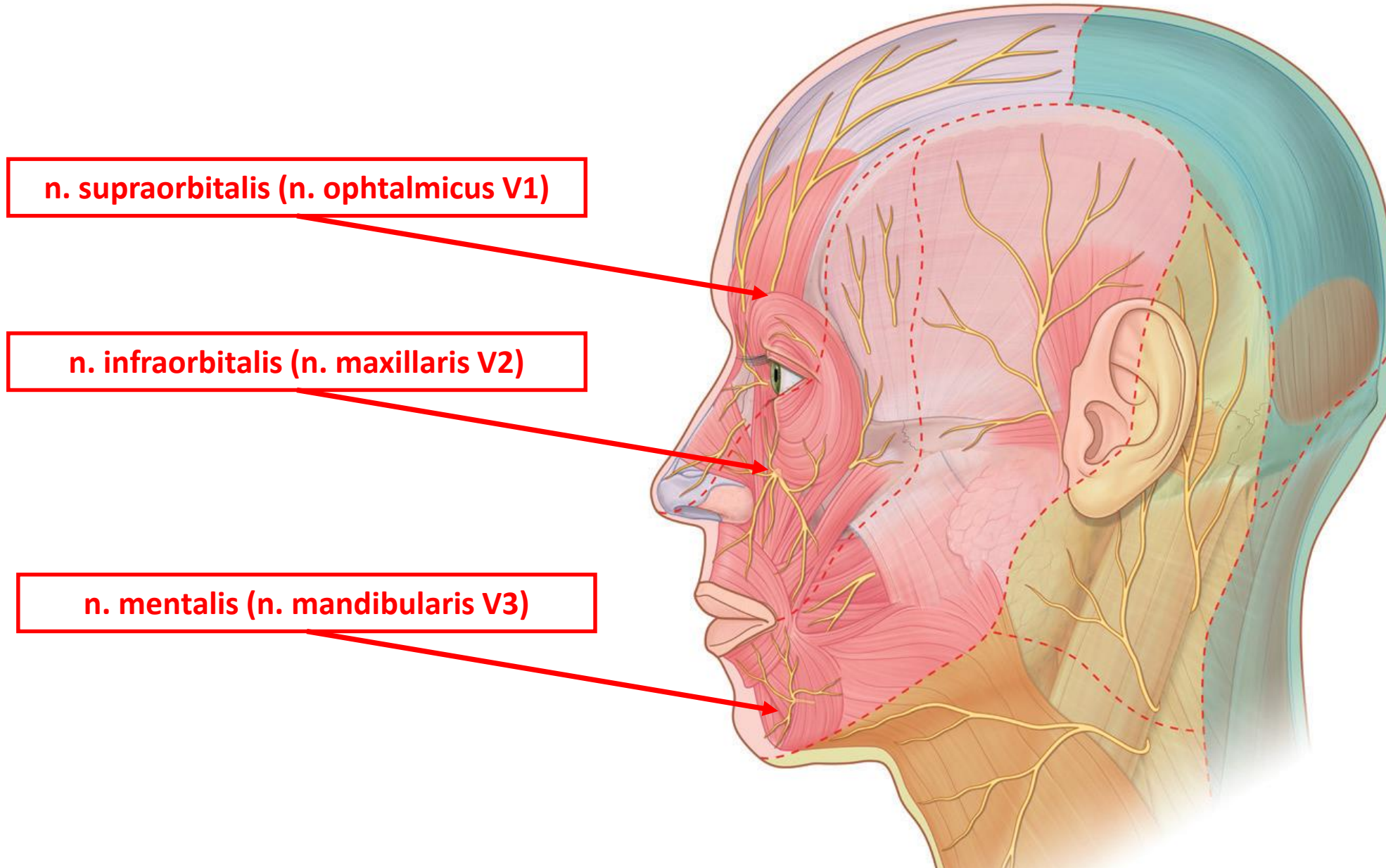
# Sinus cavernosus

- ♦ Cavernous sinus connected
- ♦ with v. ophtalmica superior
  - ♦ And v. facialis
- ♦ with v. orbitalis inferior
  - ♦ and plexus pterygoideus
- ♦ Spread of
- ♦ INFECTION
- ♦ THROMBOSIS

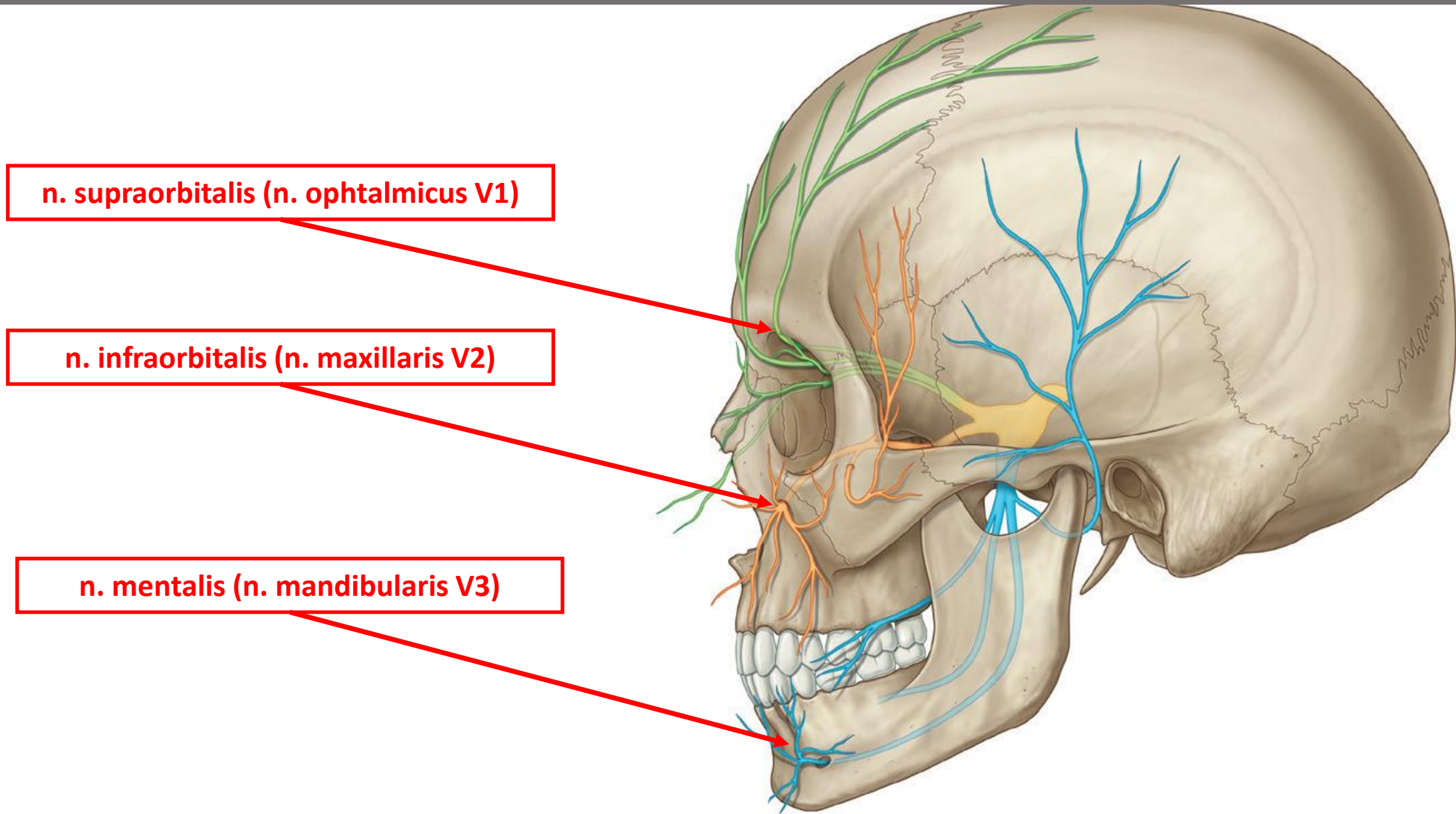




# TRIGEMINAL NERVE PALPATION



# TRIGEMINAL NERVE PALPATION

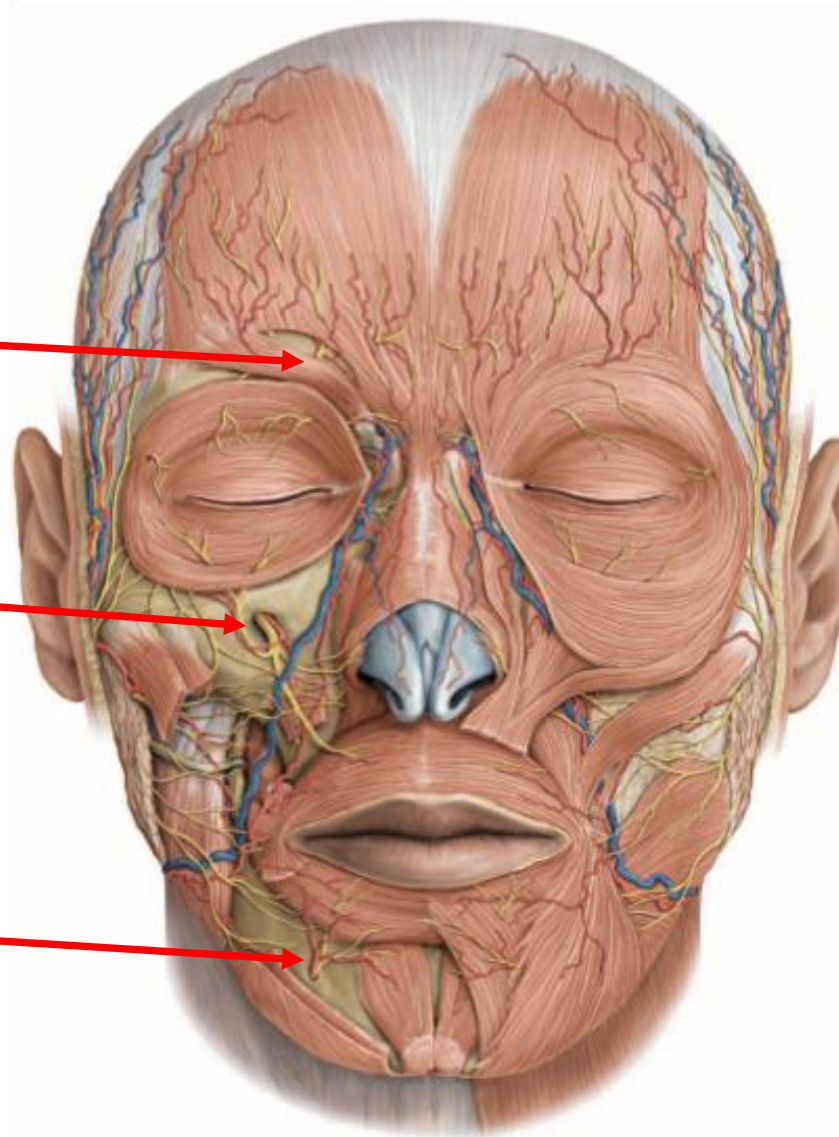


# TRIGEMINAL NERVE PALPATION

**n. supraorbitalis (n. ophtalmicus V1)**

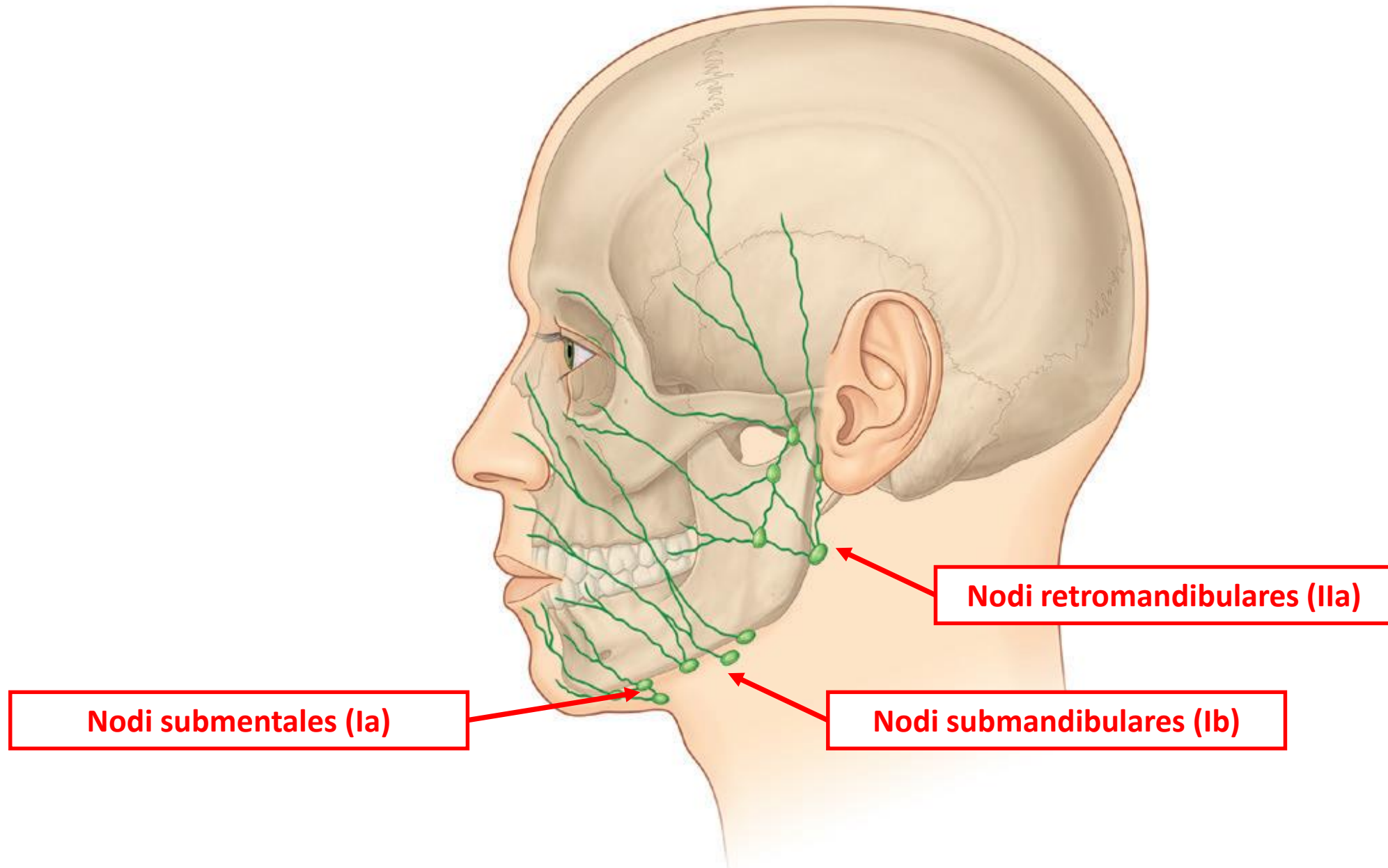
**n. infraorbitalis (n. maxillaris V2)**

**n. mentalis (n. mandibularis V3)**

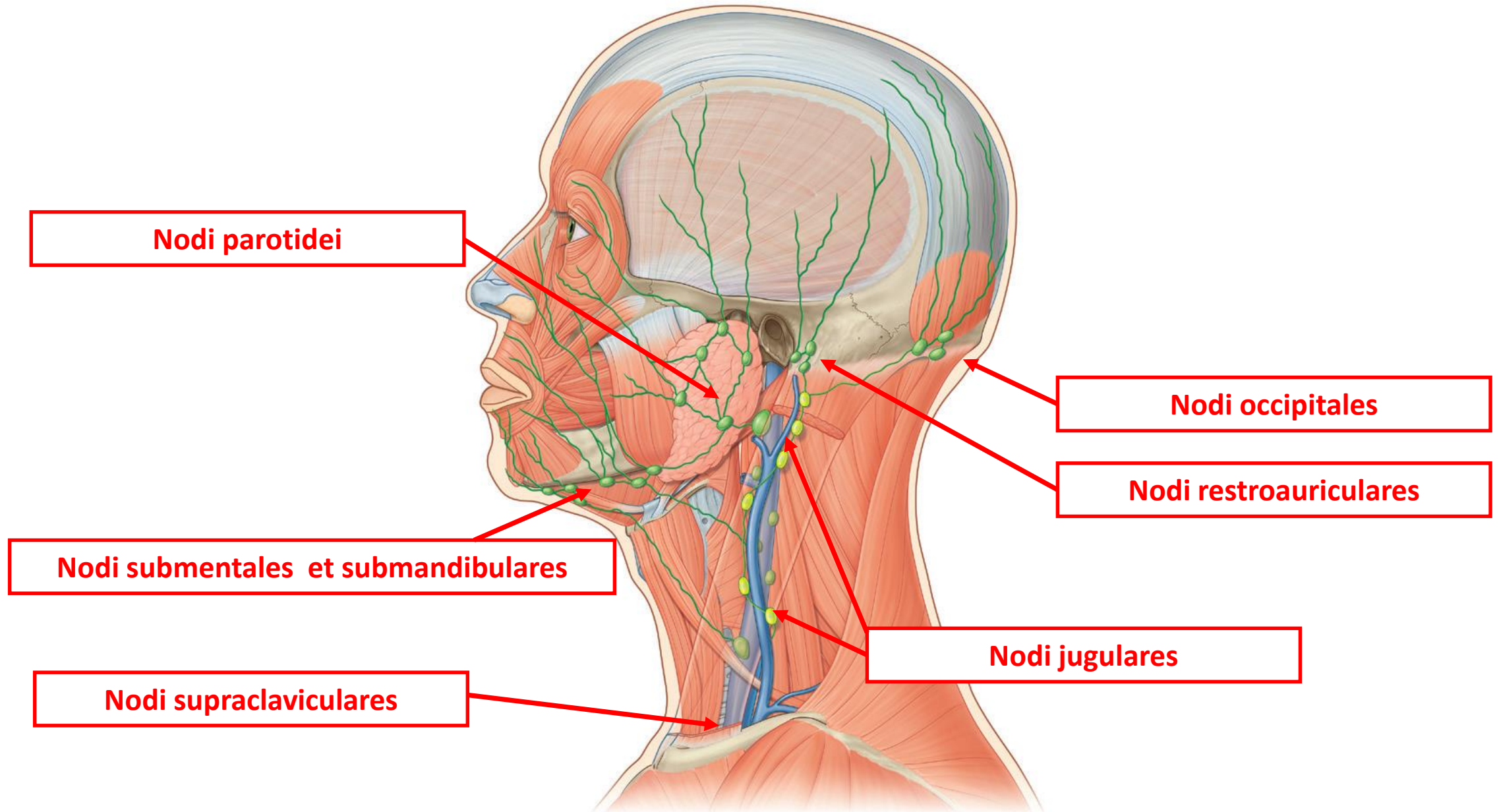




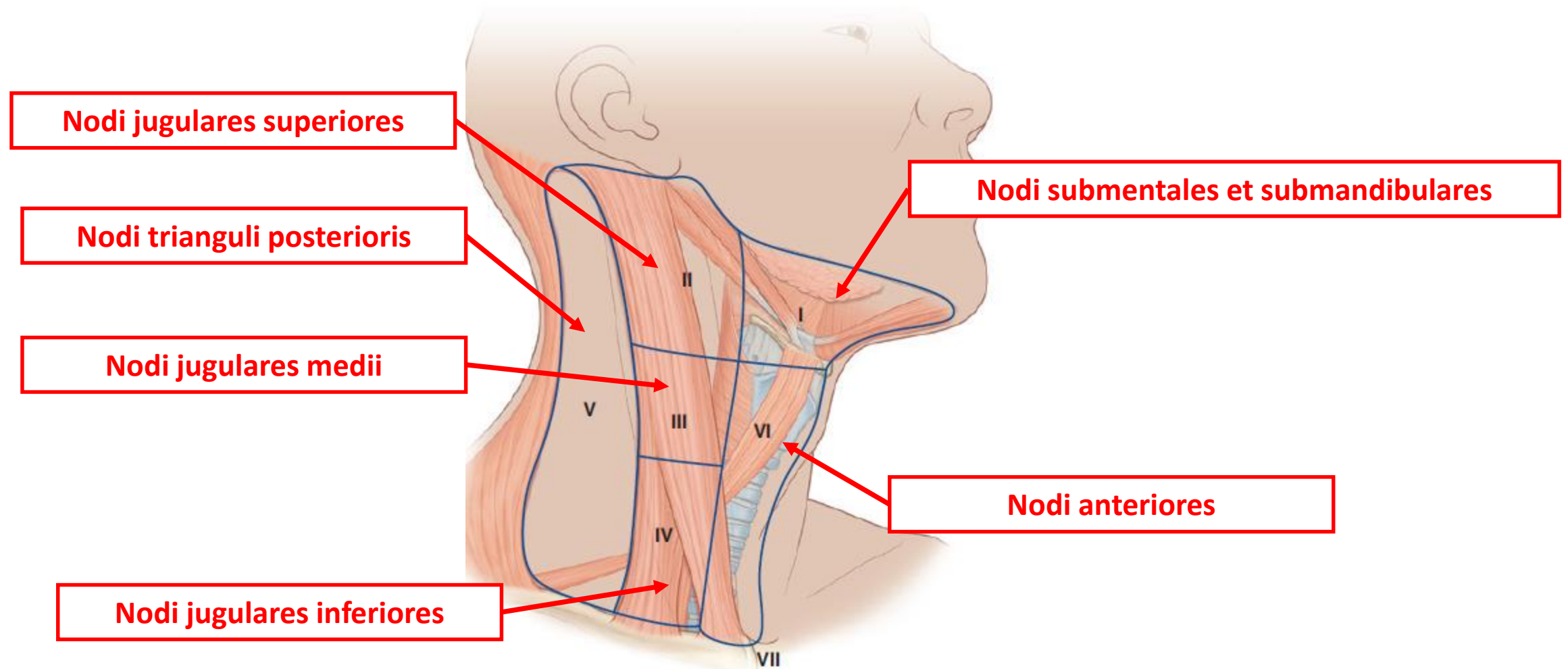
# PALPATION OF LYMPH NODES AND THEIR TRIBUTARIES



# PALPATION OF LYMPH NODES IN INFECTIONS AND LYMPHOMAS



# SURGICAL CLASSIFICATION OF LYMPH NODES





# Nodi lymphatici linguae

- ♦ Submentales
  - ♦ APICAL THIRD
- ♦ Submandibulares
  - ♦ MID THIRD
- ♦ Jugulares
  - ♦ BASE OF TONGUE

- ♦ CAVE
- ♦ CROSSING LYMPH OUTFLOW
- ♦ FREQUENT BIALTERAL LYMPH NODE METASTASES

