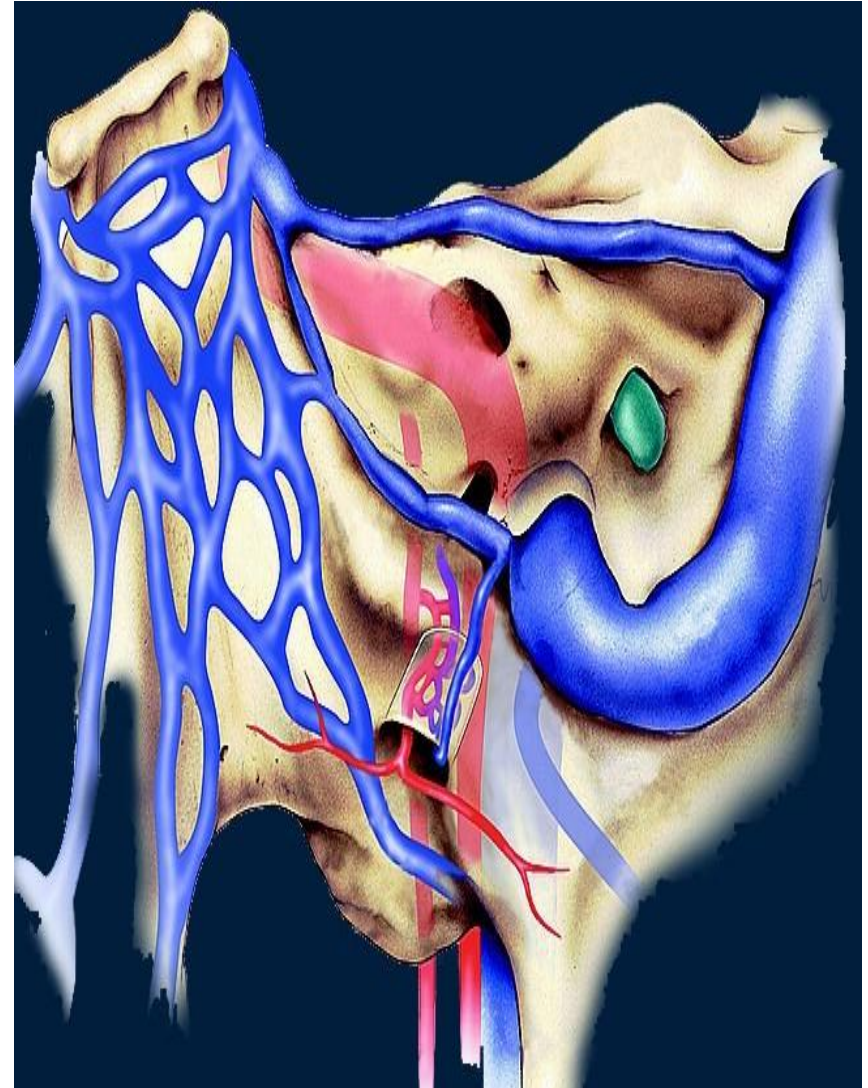


Cavernous sinus

Dr Nawal Al shannan

- **Def:**
- **large** venous spaces between the two layers of dura mater
- Lies at middle cranial fossa on either side of body of sphenoid
- distended sinus during life
- **Formation :**
- **Floor**
- endosteal layer of dura
- Roof, lateral and medial walls meningeal layer of dura
- **Extention**
- extending from the apex of the petrous temporal bone (behind)
- to the medial end of the superior orbital fissure (in front).



Learning objectives:

- At the end of lecture, you have to know:
 - 1. define cavernous sinus
 - 2. boundaries and contents
 - 3. communications
 - 4. clinical points of view

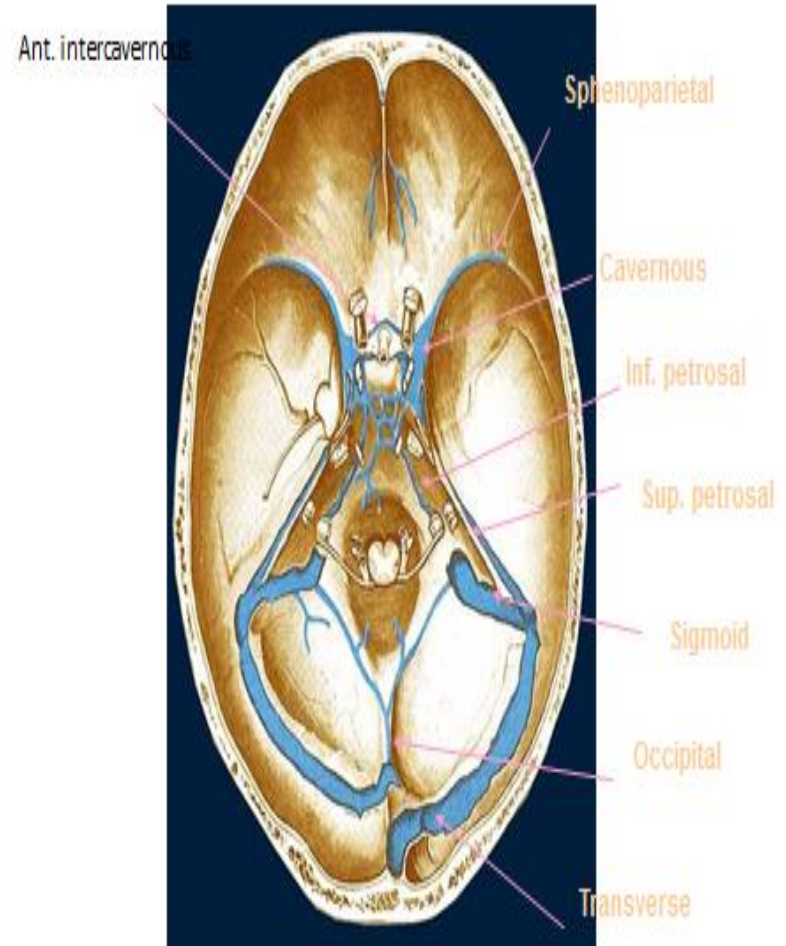


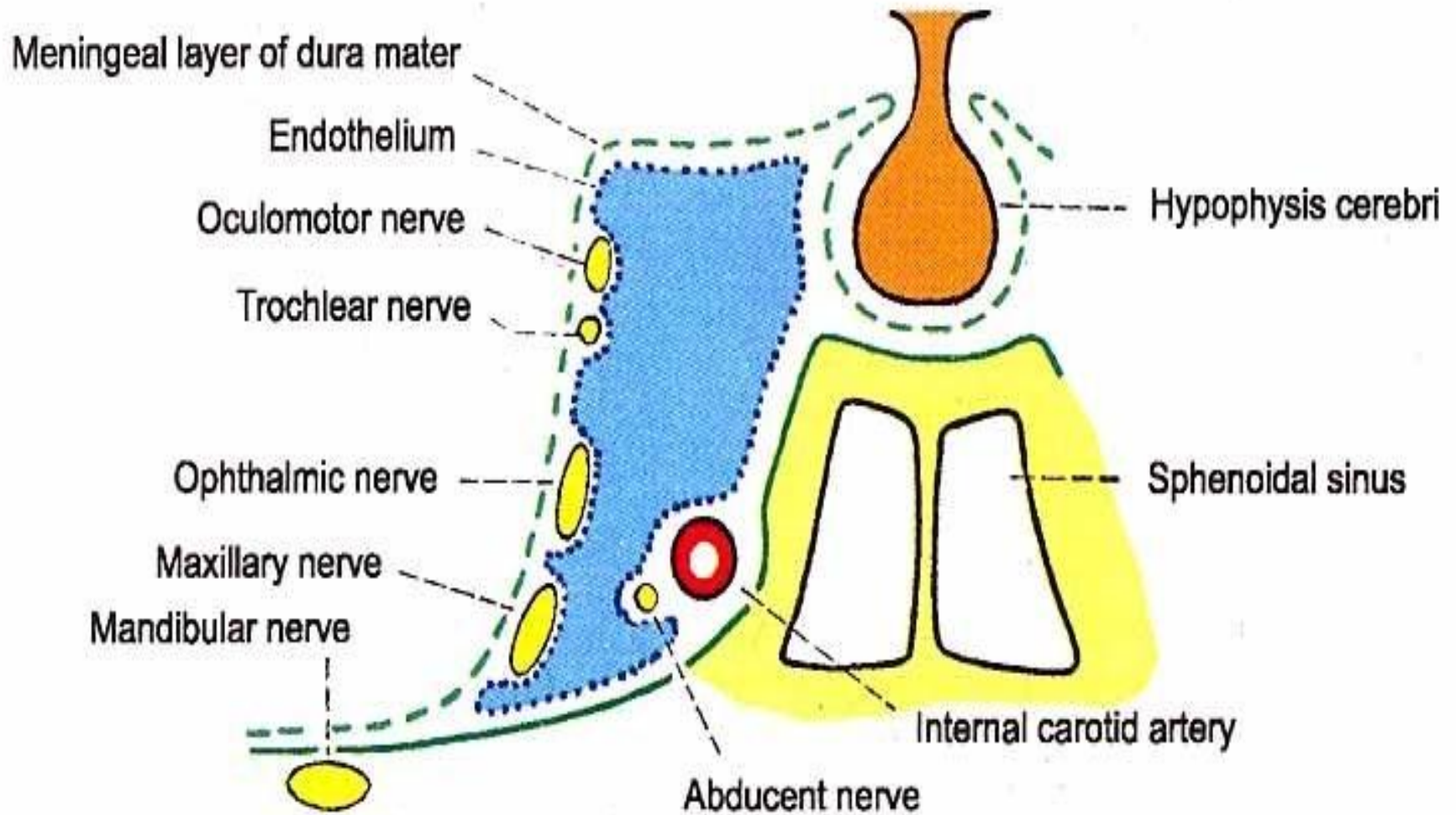
CAVERNOUS SINUS



External relations

1. Above – Optic chiasma, backward and upward turn of carotid – carotid siphon
2. Medial – Hypophysis cerebri
3. Lateral – Posterolateral part cavum trigeminale containing ganglion
4. Below - Sphenoid sinus





Coronal section through the middle cranial fossa showing the relations of the cavernous sinus.

Cavernous sinus

Relations :

Sup: ::: optic tract, internal carotid artery, ant- perforated substances

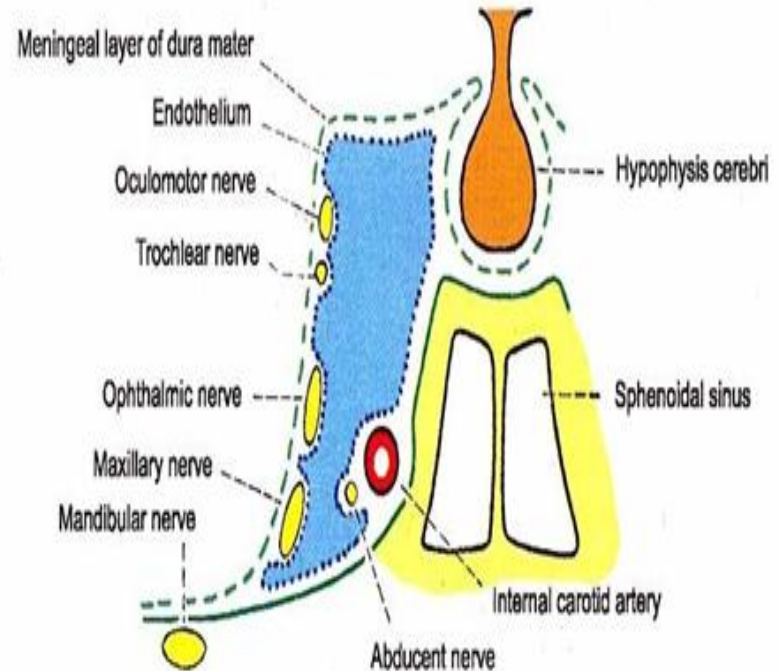
inf: ::::: f- lacerum

med: :::: hypophyseal cerebri, sphenoidal air sinuses

lat: ::::: temporal lobe with uncus

ant: ::::: sup-orbital fissure , apex of orbit

post: ::::: apex of petrous , crus cerebri of



Coronal section through the middle cranial fossa showing the relations of the cavernous sinus.

Contents

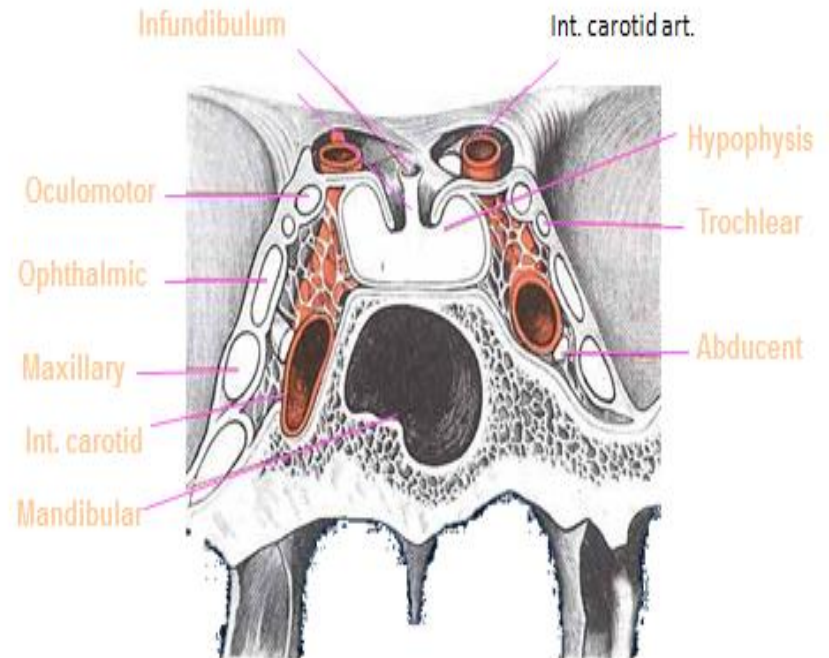
Structures at lateral walls , from above downwards

- * abducent n.
- * trochlear n.
- * Ophthalmic n.
(lacrimal n, frontal n , nasociliary n)
- * maxillary n at pterygo-palatine foss
- * trigeminal ganglia

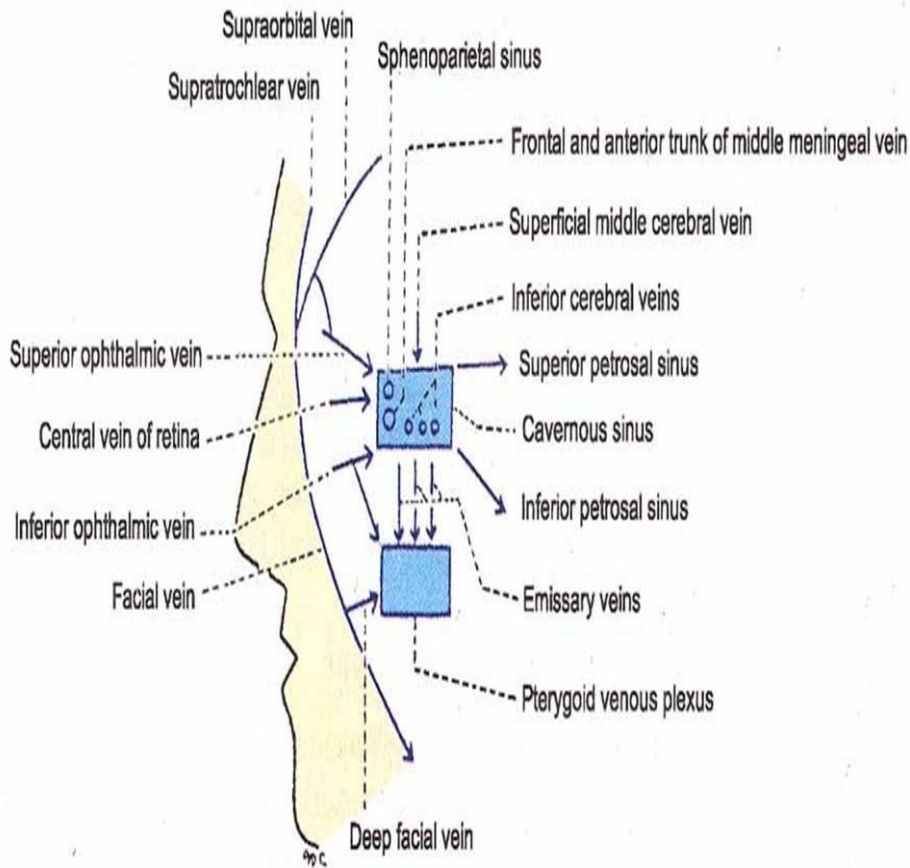
Structures at the center

- * internal carotid artery
- * abducent n.

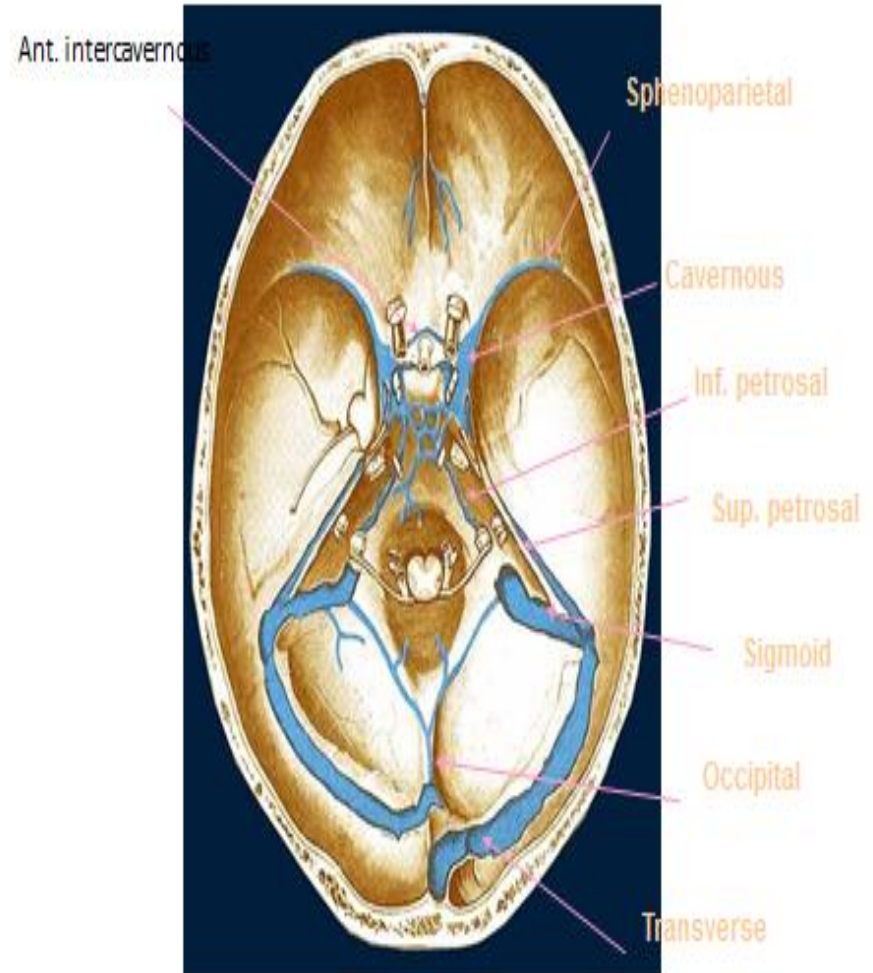
Structures at lateral wall and center are separated from the blood by endothelia lining



Cavernous sinus

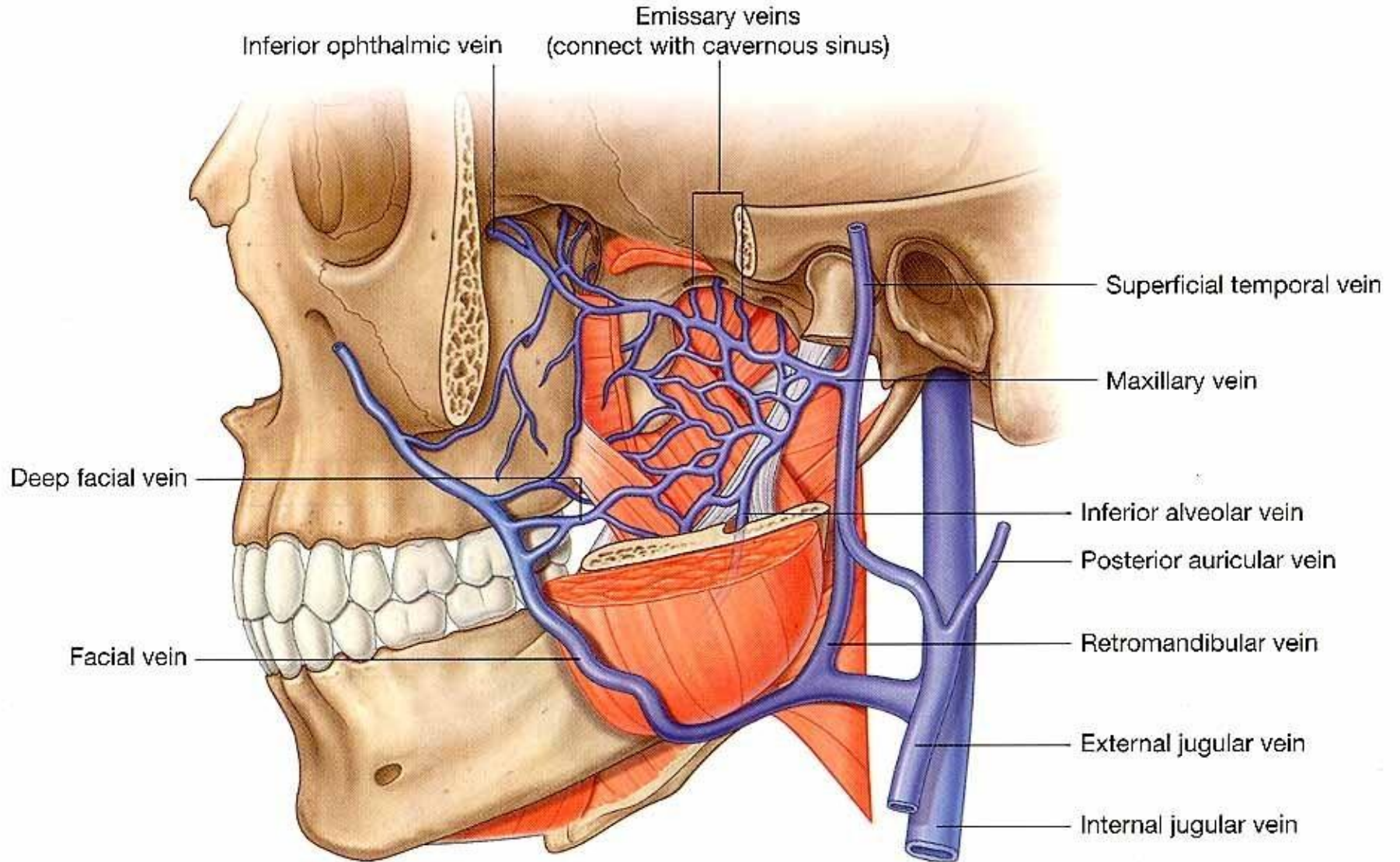


Side view of the tributaries and communication of the cavernous sinus.

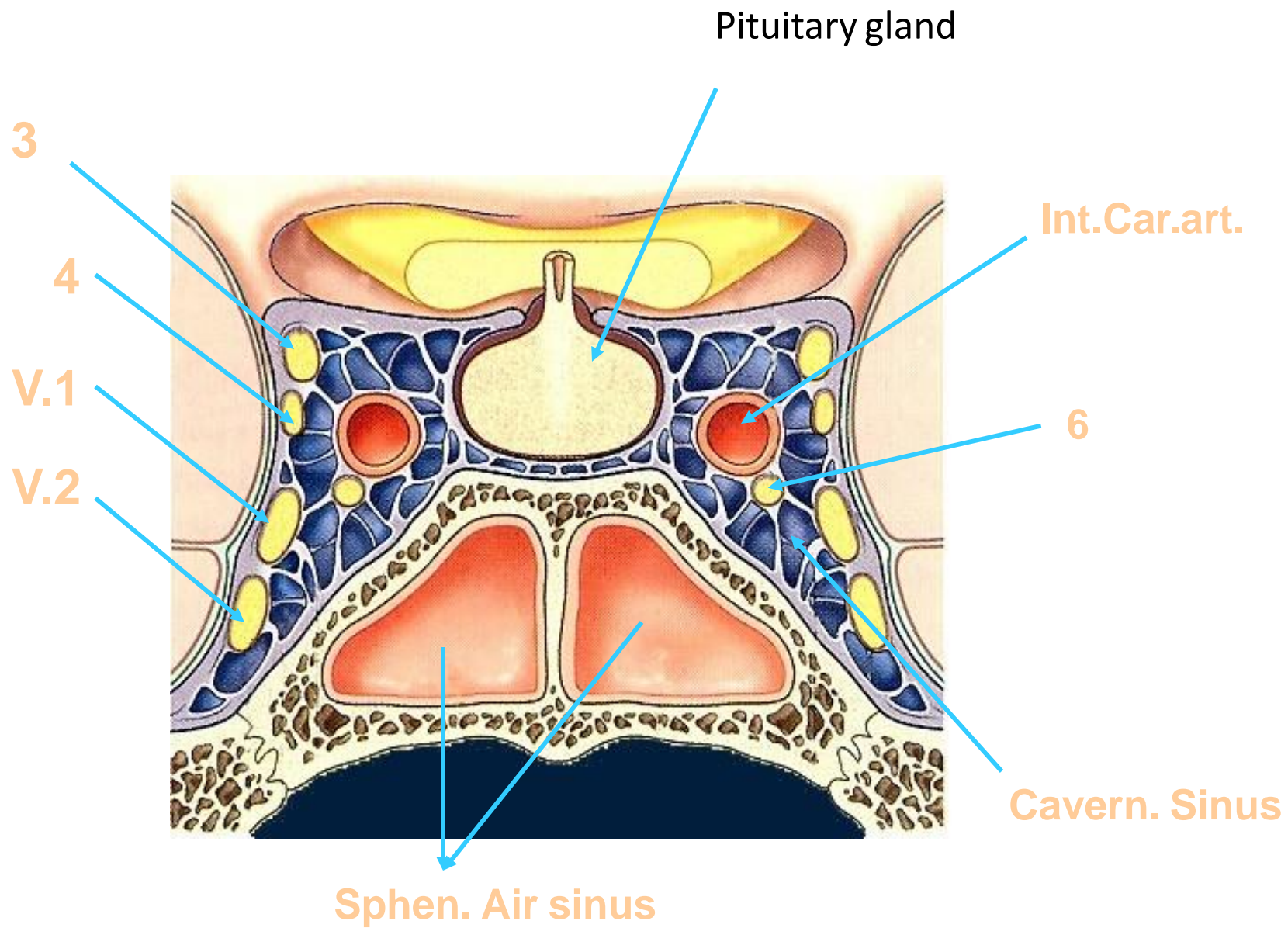


Communications

1. Transverse sinus via Sup. petrosal sinus
2. Int. Jugular vein **through** inf. petrosal sinus
3. Pterygoid venous plexus **through** emissary veins foramen ovale, spinosum and lacerum
4. Facial vein **through** sup. Ophthalmic vein & angular vein or pterygoid venous plexus and deep facial vein
5. Opp. Cavernous sinus **through** ant / post intercavernous sinuses
6. Sup. Sag. Sinus **through** Middle cerebral vein and vein & sup. Anastomotic vein







Superior sagittal sinus

Falx cerebri

Inferior sagittal sinus

Straight sinus

Cavernous sinus

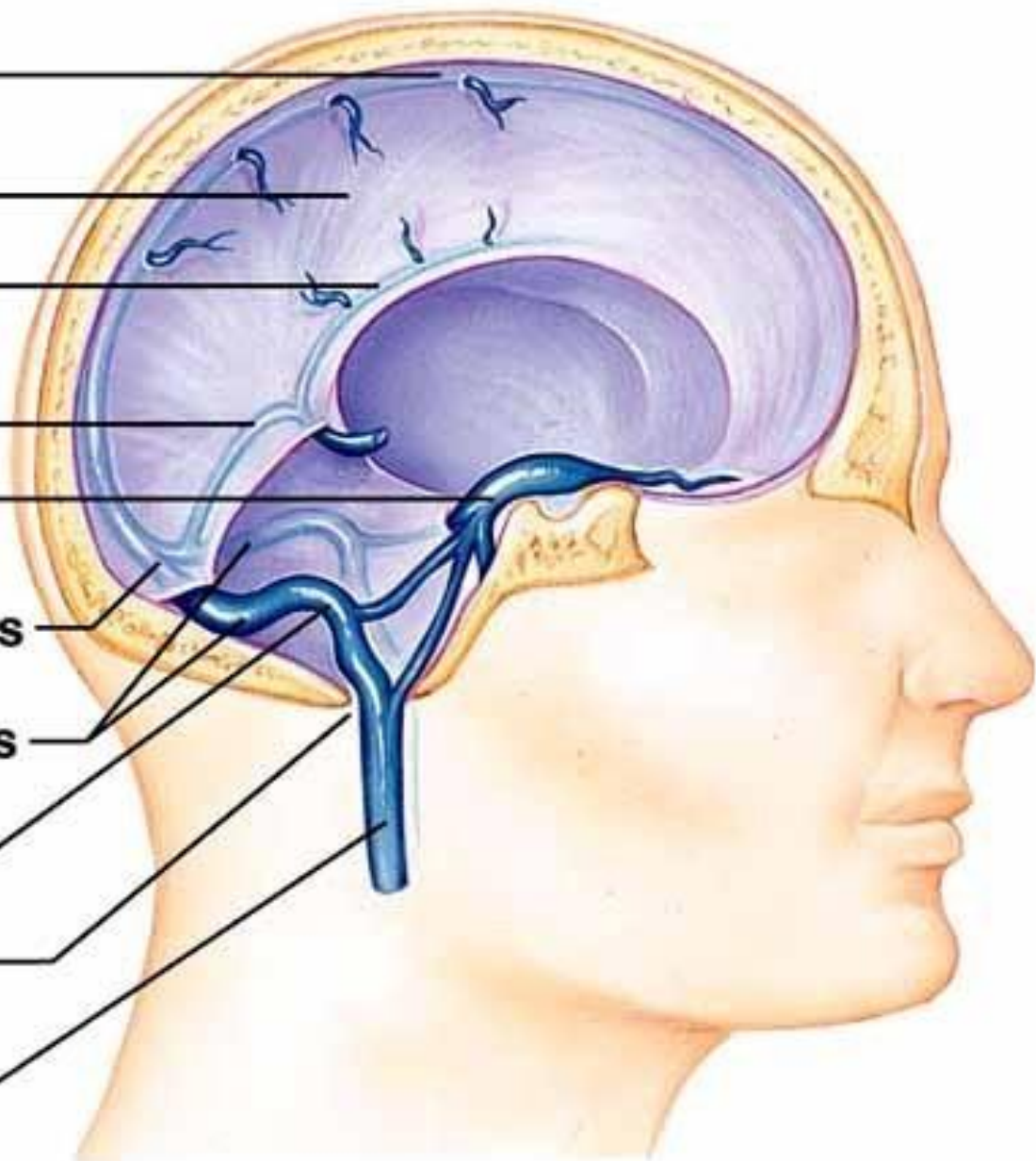
Junction of sinuses

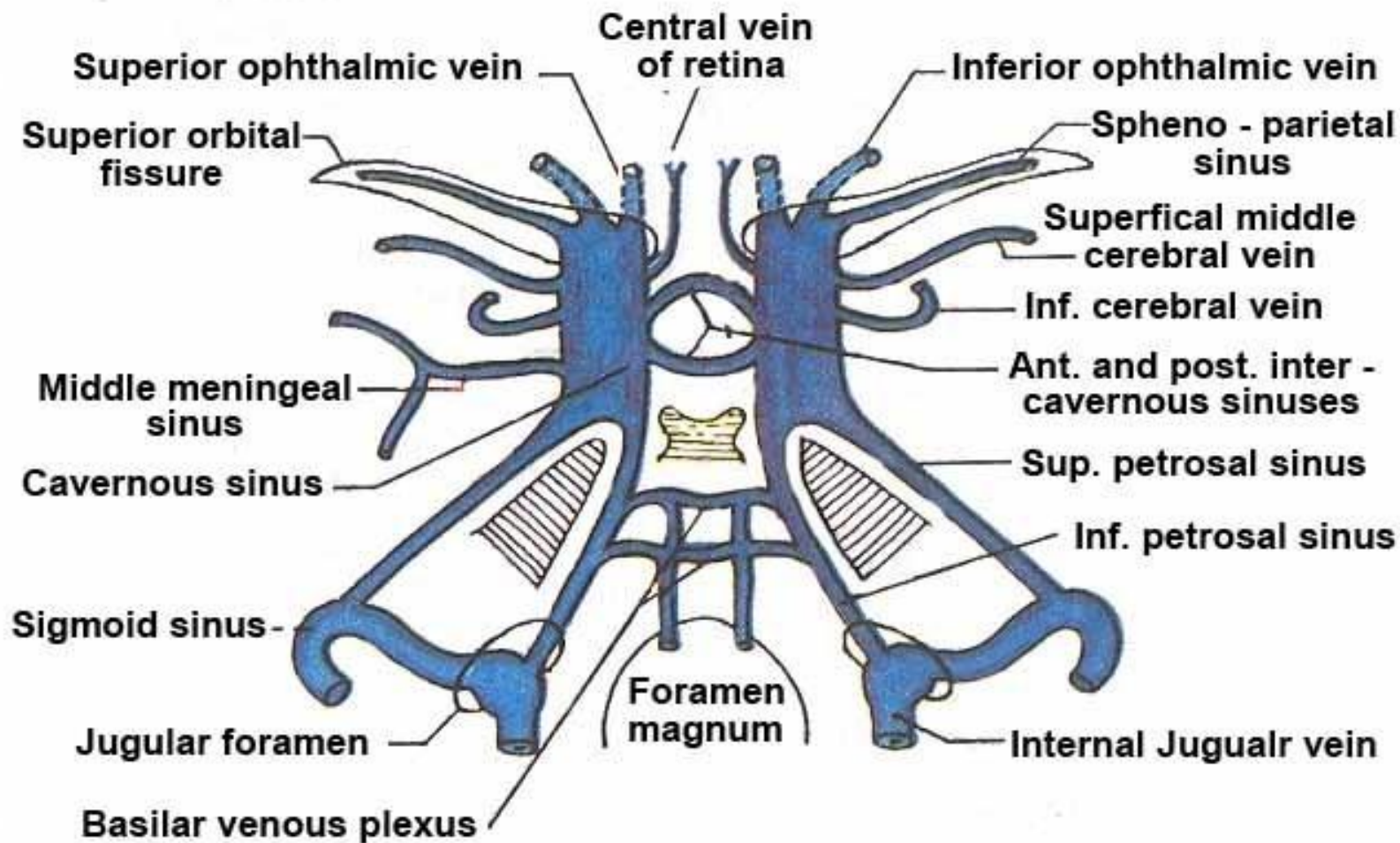
Transverse sinuses

Sigmoid sinus

Jugular foramen

Right internal jugular vein





Cavernous sinus with tributaries and communications

Cavernous sinus thrombosis

Cause : Sepsis ,
dangerous area a of face, paranasal sinuses, nasal cavity

Neurological – severe pain/ eye , forehead / Ophthalmic n.

Paralysis of ocular muscles–

- 3rd, 4th and 6th n.

Venous block – oedema of eye lids, cornea, nose /exophthalmos

Injury causing communication between cavernous sinus and carotid leads to pulsating exophthalmos

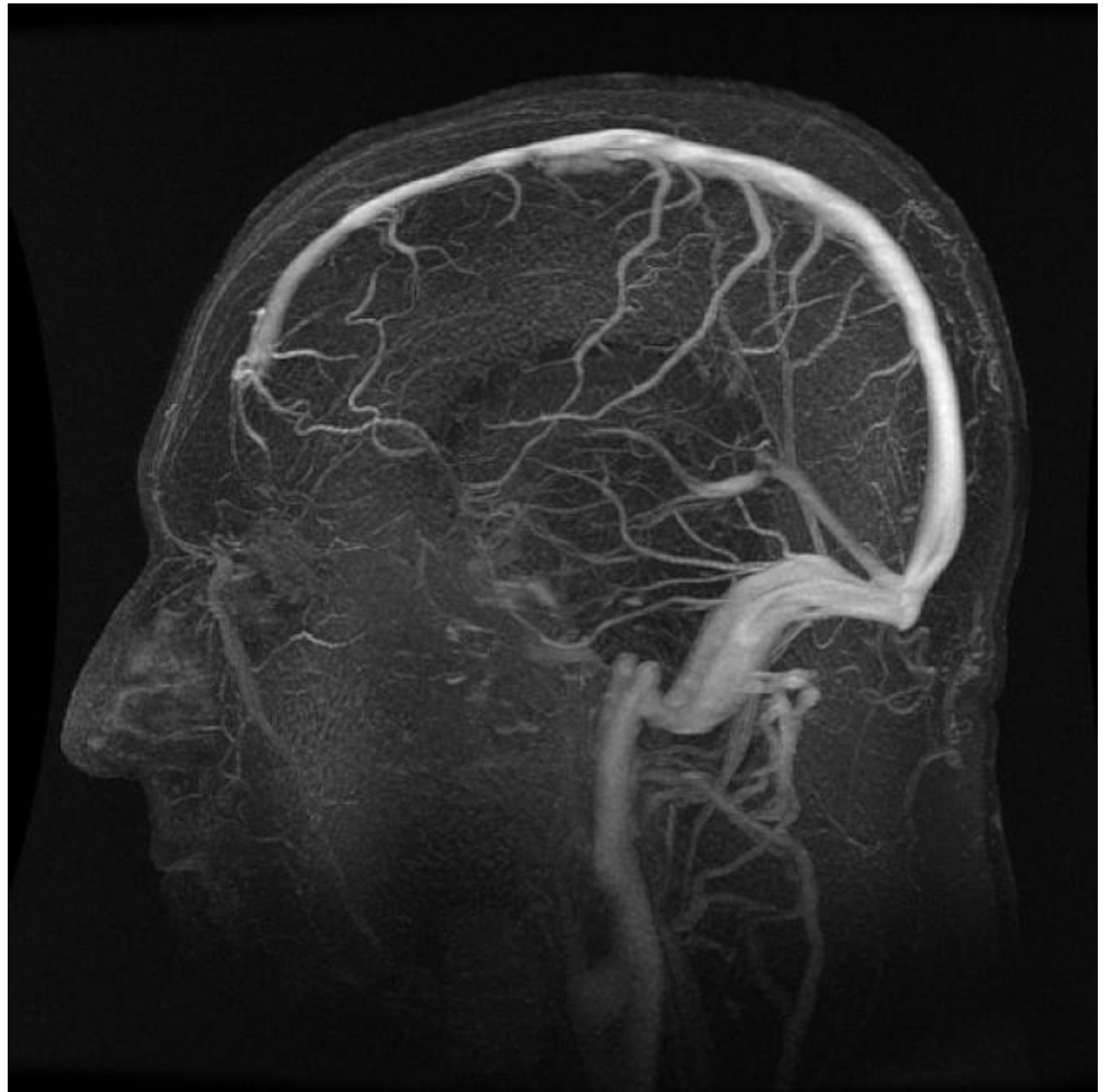
Cavernous sinus thrombosis



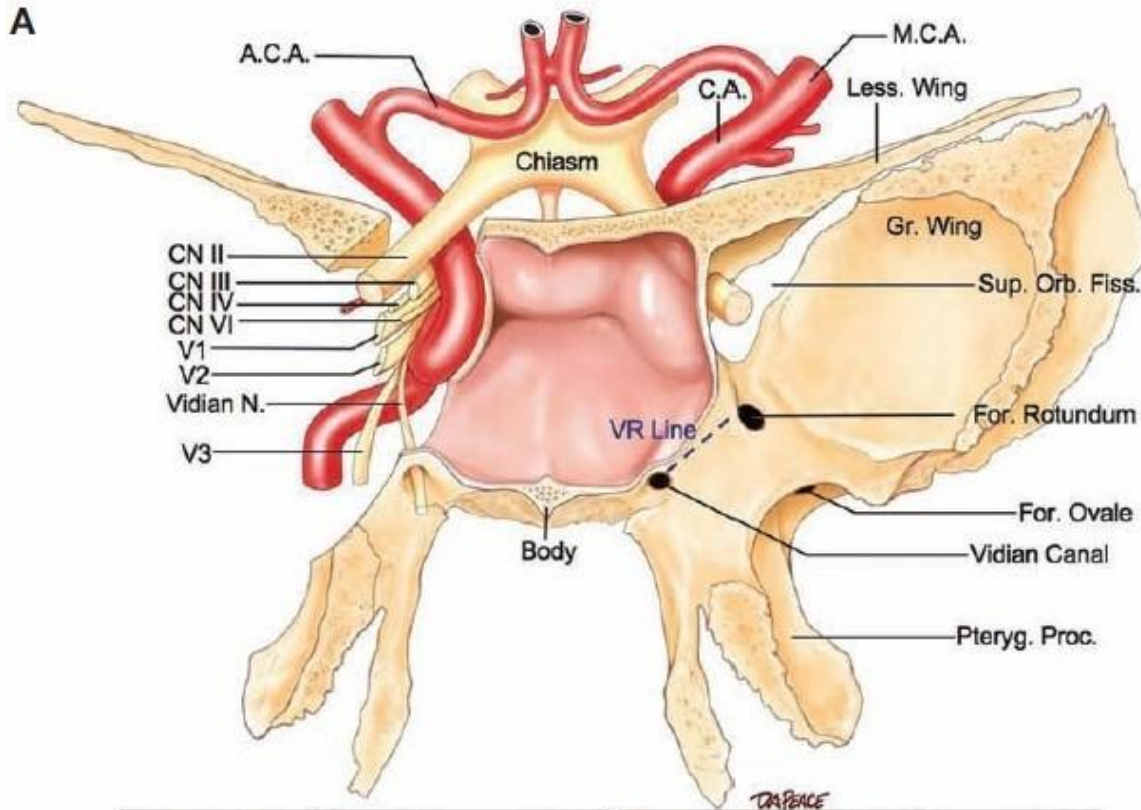
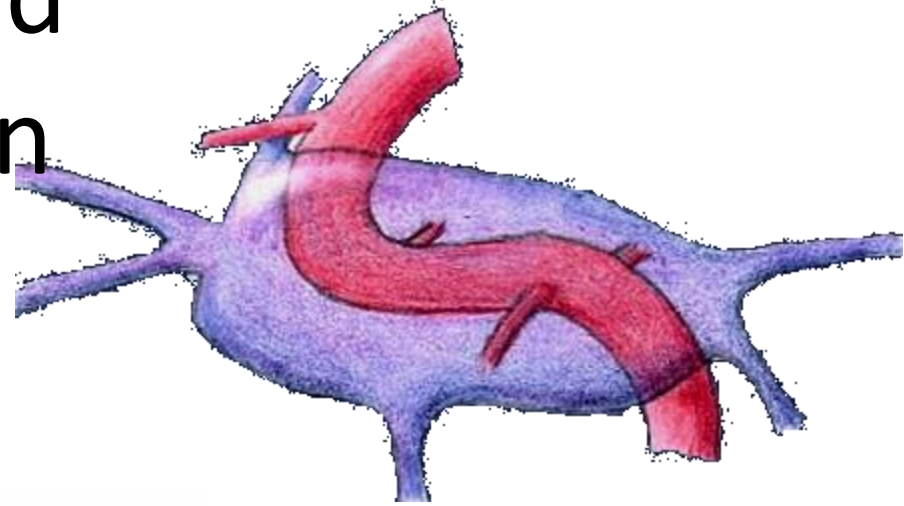
Cavernous sinus thrombosis

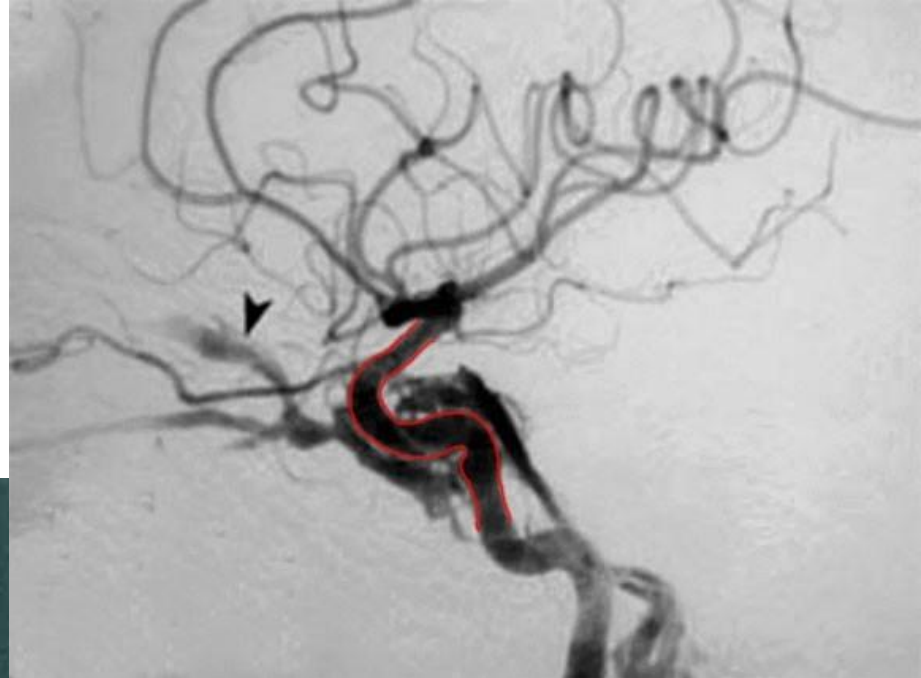
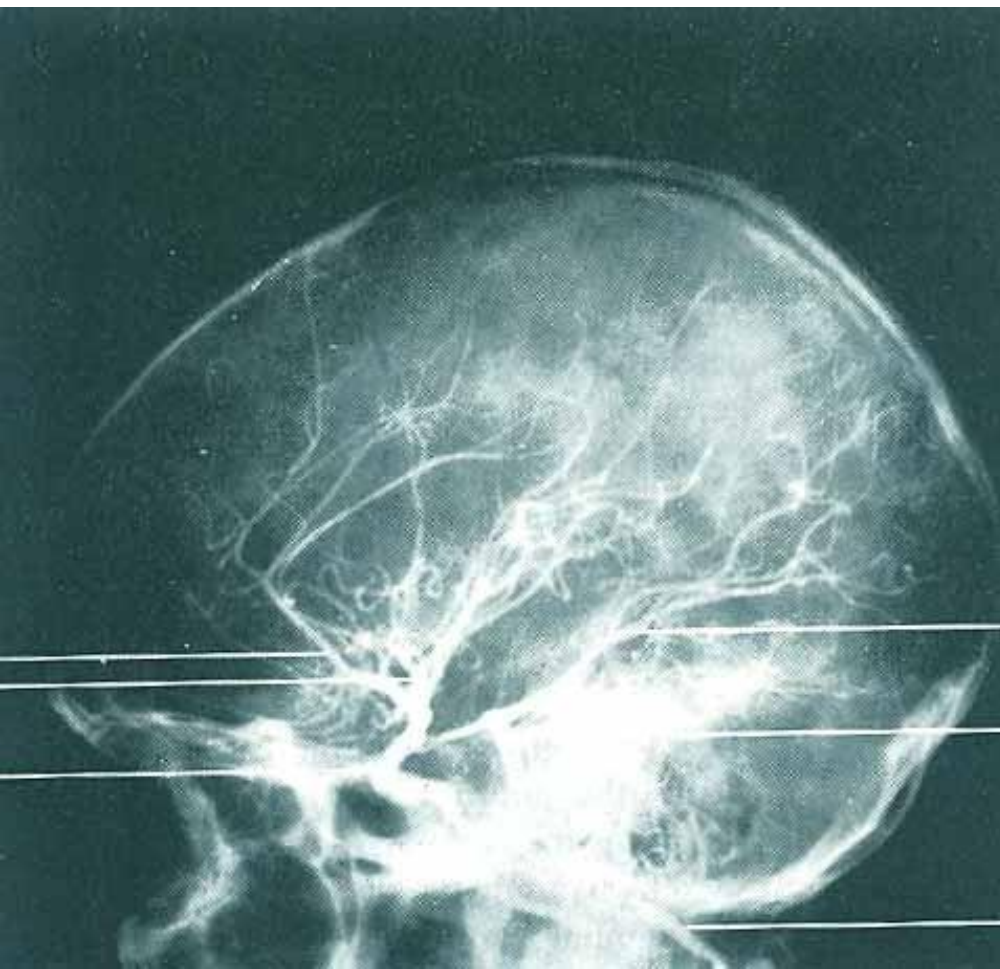


Sinogram



Carotid siphon





Emmissary veins

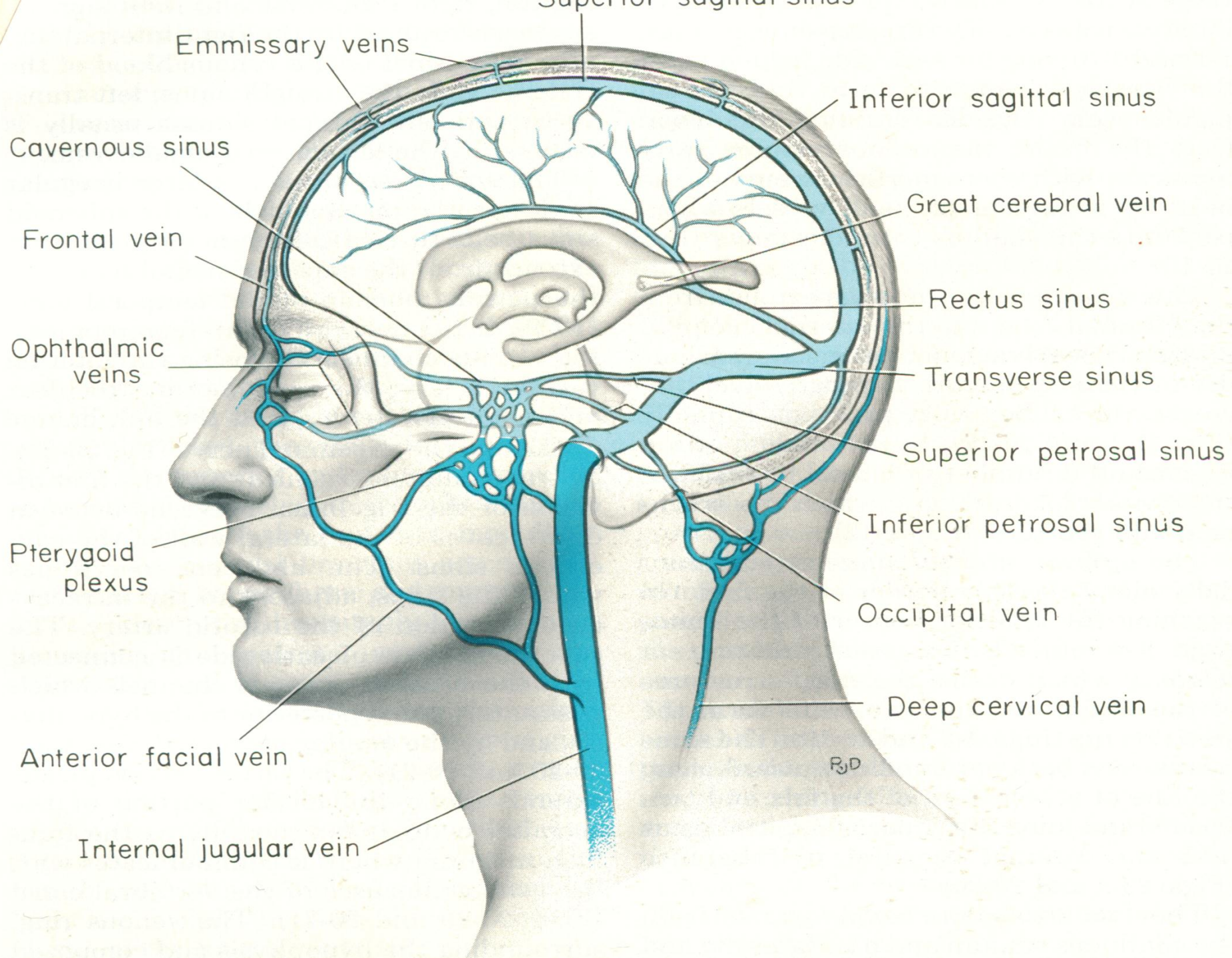
Def:

*** **valveless** veins which connect the dural sinuses inside the skull with the veins outside the skull.

- *** They pass through foramina in the walls of
- the skull.

Clinical importance:

1. They serve to **equalize** blood pressure between dural sinuses and veins outside the skull.
2. **Infection** outside the skull may pass along these routes to reach cranial cavity.



Connections:

1. With dural sinuses:

a. With superior sagittal sinus through

1. **parietal** foramen joining the sinus with occipital sinus
2. foramen **ceacum** joining the sinus with veins of the nose

b. With sigmoid sinus through

1. **mastoid** foramen joining with occipital veins
2. **post-condylar foramen** joining with sub-occipital plexus of veins

- c. With **cavernous sinus** through
1. **foramen-ovale** joining with **pterygoid** plexus of veins
 2. **carotid canal** joining a **pharyngeal** plexus of veins
 3. **ophthalmic veins** , may be considered as emissary veins by connecting **cavernous** with **cutaneous** veins of forehead and upper part of the face.

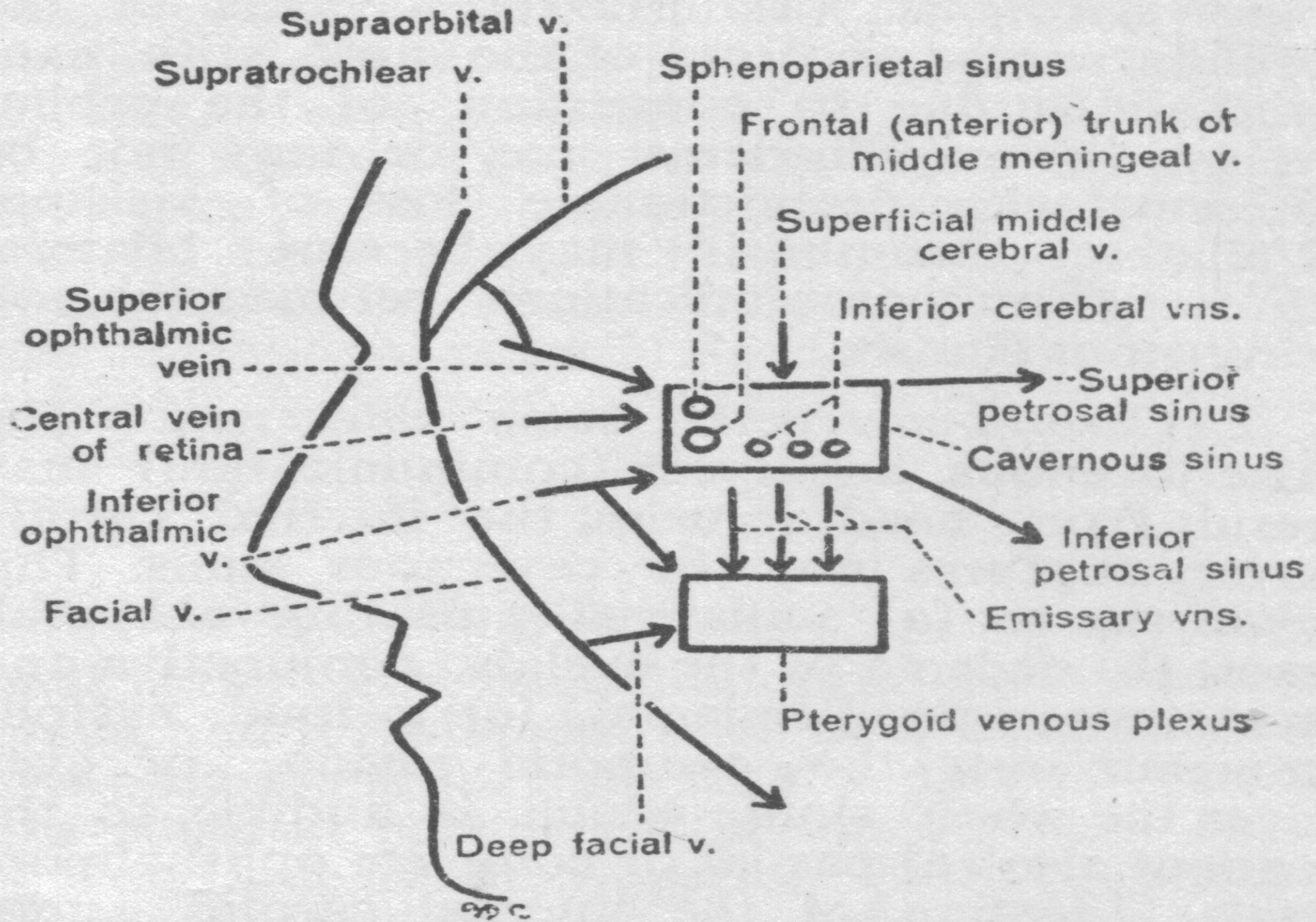


Fig. 38 Side view of the tributaries and communications of the cavernous sinus.