



Cranial cavity

Lecture 8

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-1 Falx cerebri

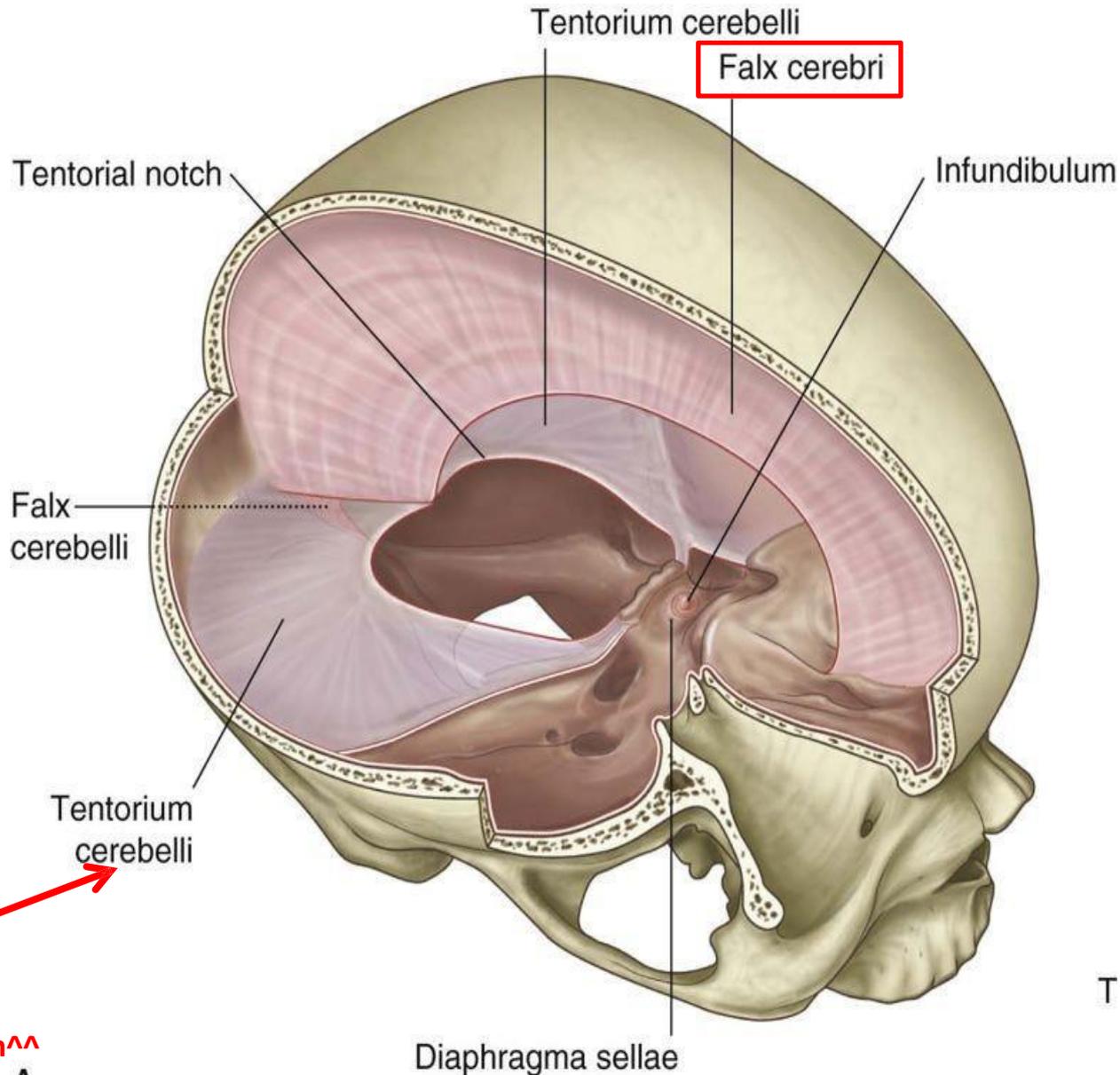
Is a sickle-shaped fold ➤
of dura mater

Lies in the midline ➤
between the two
cerebral hemispheres

In front is attached to ➤
the **crista galli and**
frontal crest

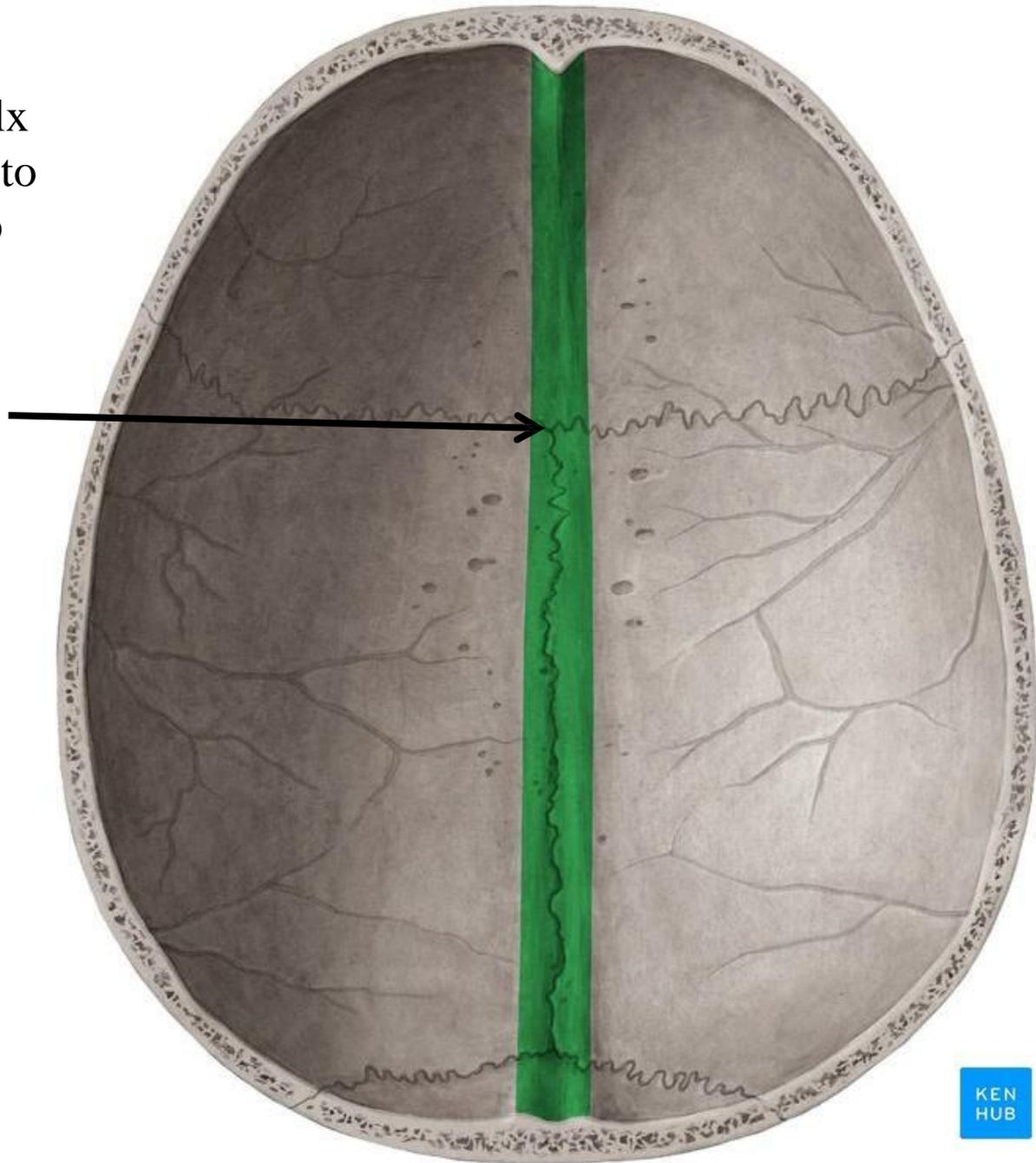
Its posterior part ➤
blends in the midline
with the upper surface of the
Tentorium cerebelli

Tentorium >> looks like a tent^^
cerebelli >> it roofs over the cerebellum^^



A

The upper fixed border of falx cerebri is attached at midline to internal surface of skull cap



Tentorium cerebelli

Is a tent-shaped fold of dura mater (horizontal projection) →
Roofs over the posterior cranial fossa →

Divides the cranial cavity into →

SUPRATENTORIAL ↘

INFRATENTORIAL ↙

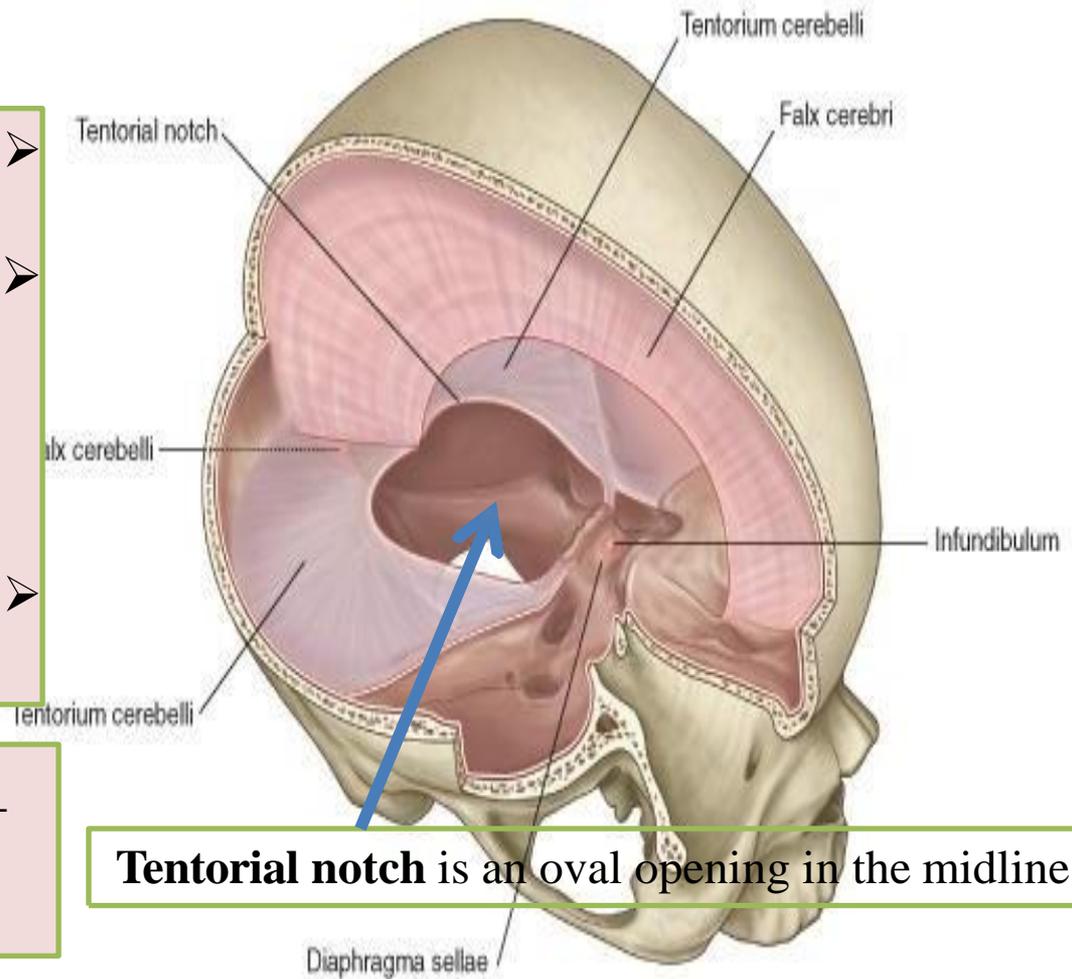
Separates the cerebellum from the occipital lobes →

Ends anteriorly at the anterior and posterior clinoid processes

It is attached by its convex border

behind: to the occipital bone along the grooves for the transverse sinuses

in front: to the superior border of the petrous part of the temporal bone on either side, enclosing the superior petrosal sinuses



Tentorial notch is an oval opening in the midline

Tentorial notch

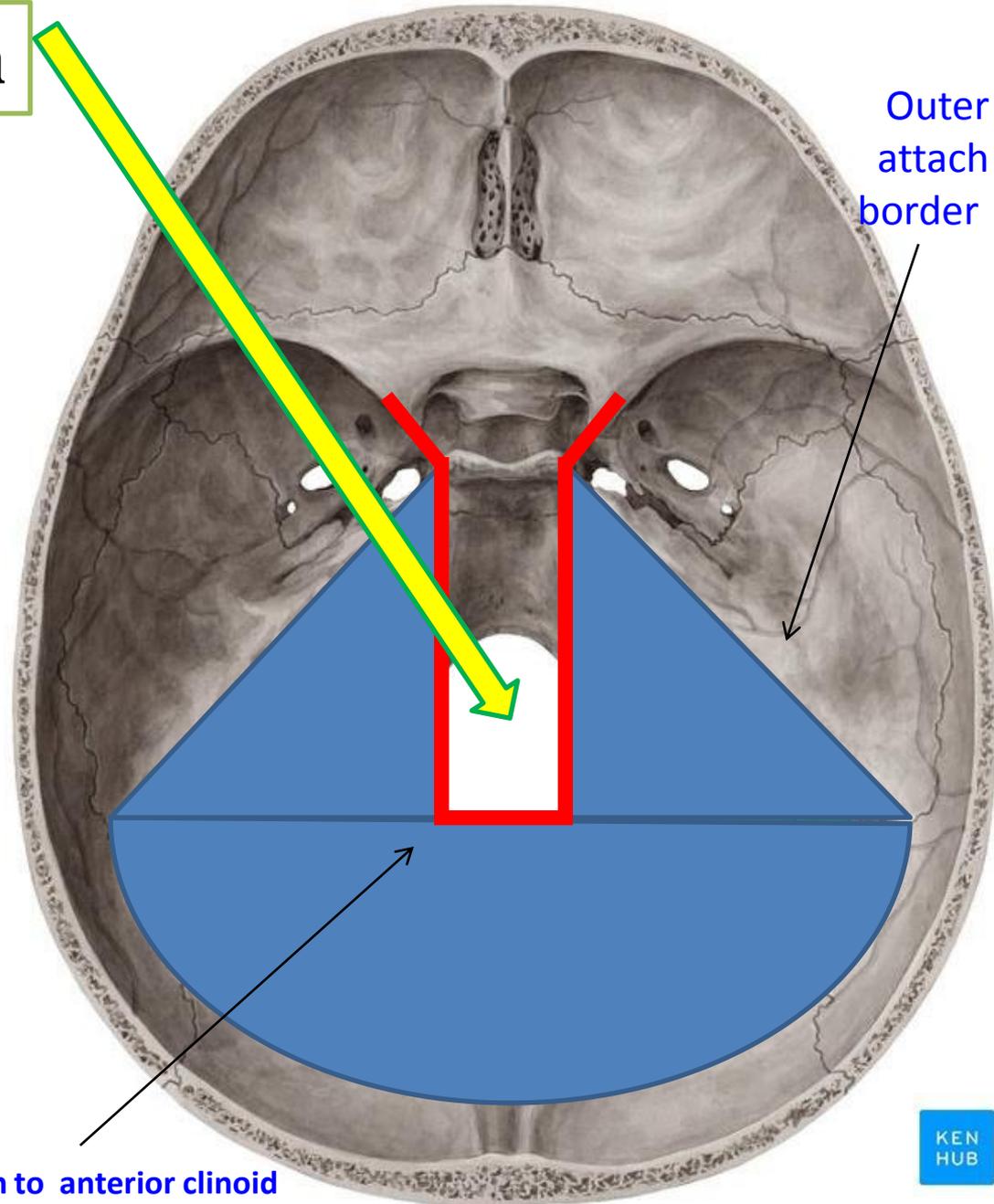
Tentorium cerebelli attachments

Anterior and posterior clinoid processes

Superior borders of the petrous part of the temporal bone (enclosing the superior petrosal (sinuses

Occipital bone
Grooves for the transverse)
(sinuses

Free Inner border :
Extend anteriorly to be attach to anterior clinoid forming a notch for the passage of brain stem



Falx Cerebelli -3

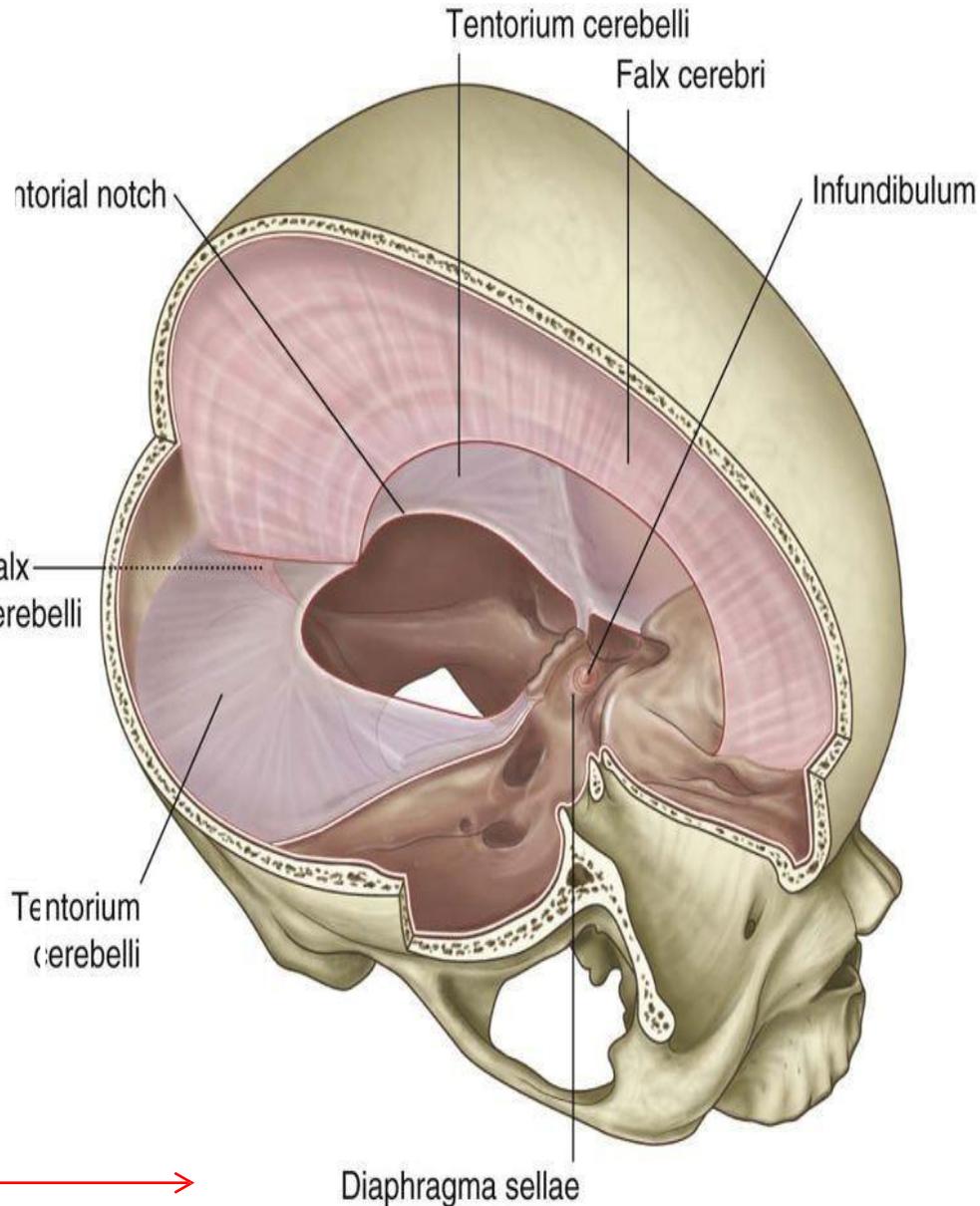
Is a small vertical fold of dura mater ➤

:Attached ➤

Posteriorly to internal occipital crest

Superiorly to tentorium cerebelli

Lies in the midline between the two ➤
cerebellar hemispheres



Looks like the diaphragm

It roofed sella turcica

Diaphragma sellae-4

Is a small horizontal fold of dura mater that forms the roof for **the sella turcica**

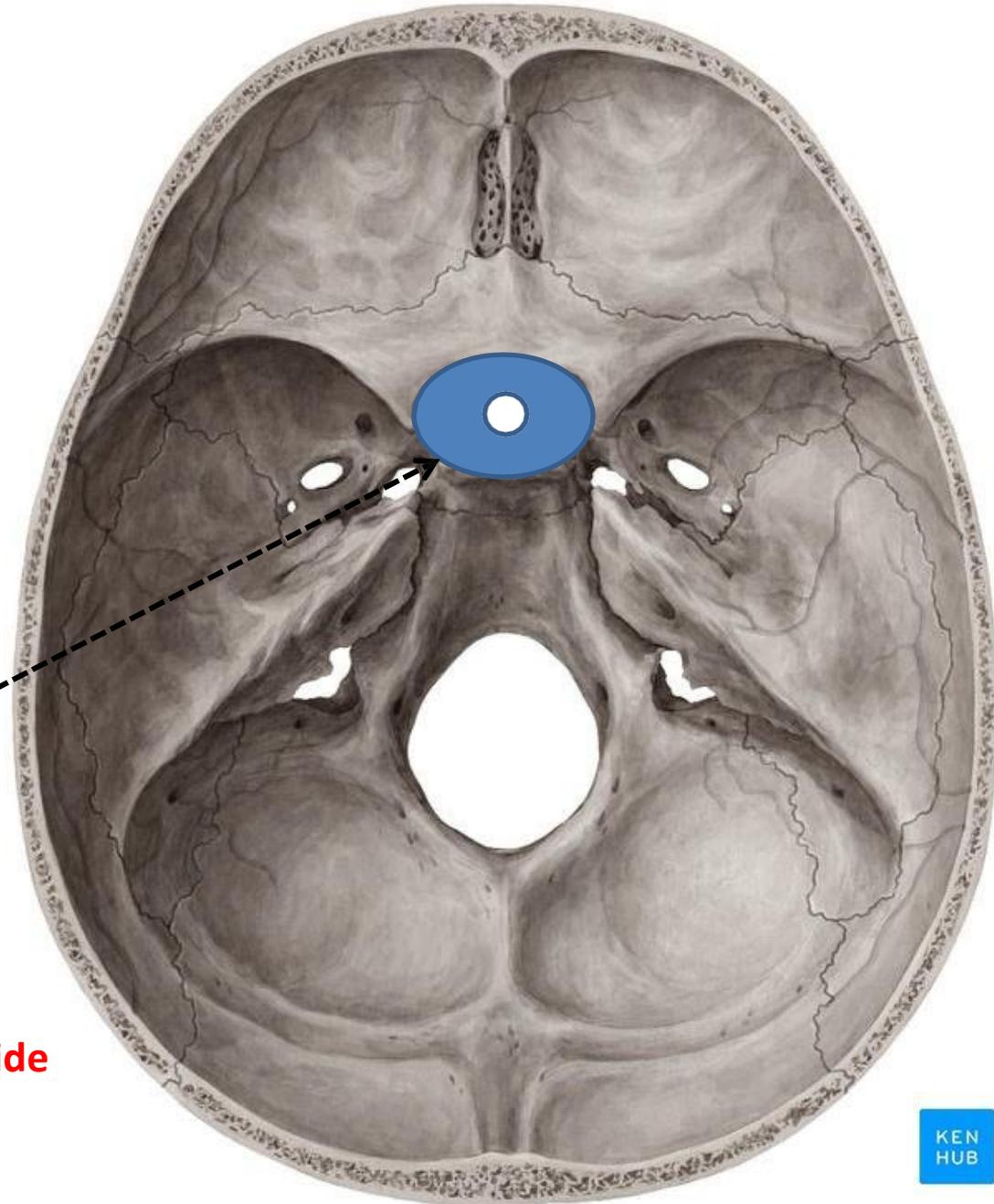
A small opening in its center allows ➤ passage of the **stalk of the pituitary gland** (connecting the pituitary gland (with the base of the brain

A

Diaphragma sellae

Sella turcica

Hypophyseal fossa

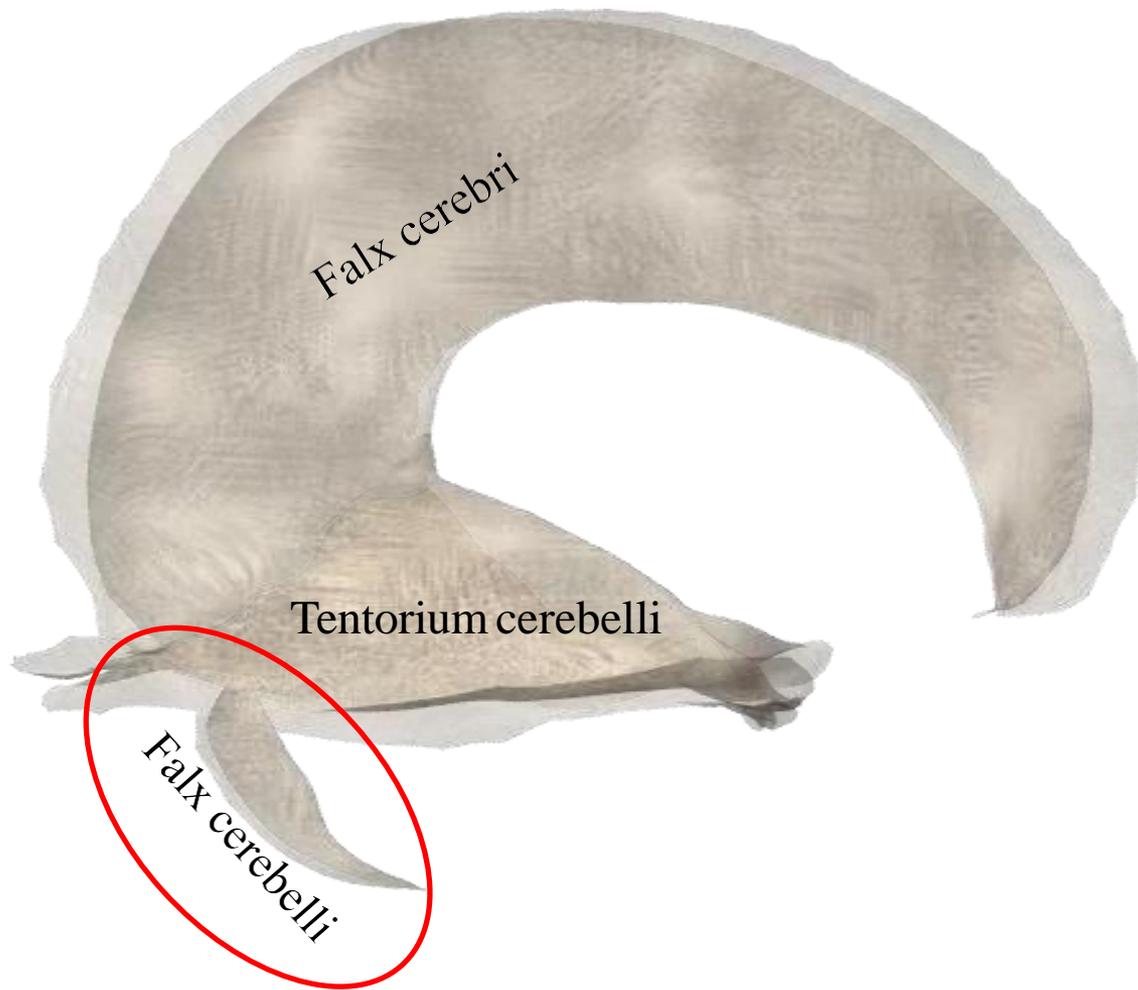


Circular in shape

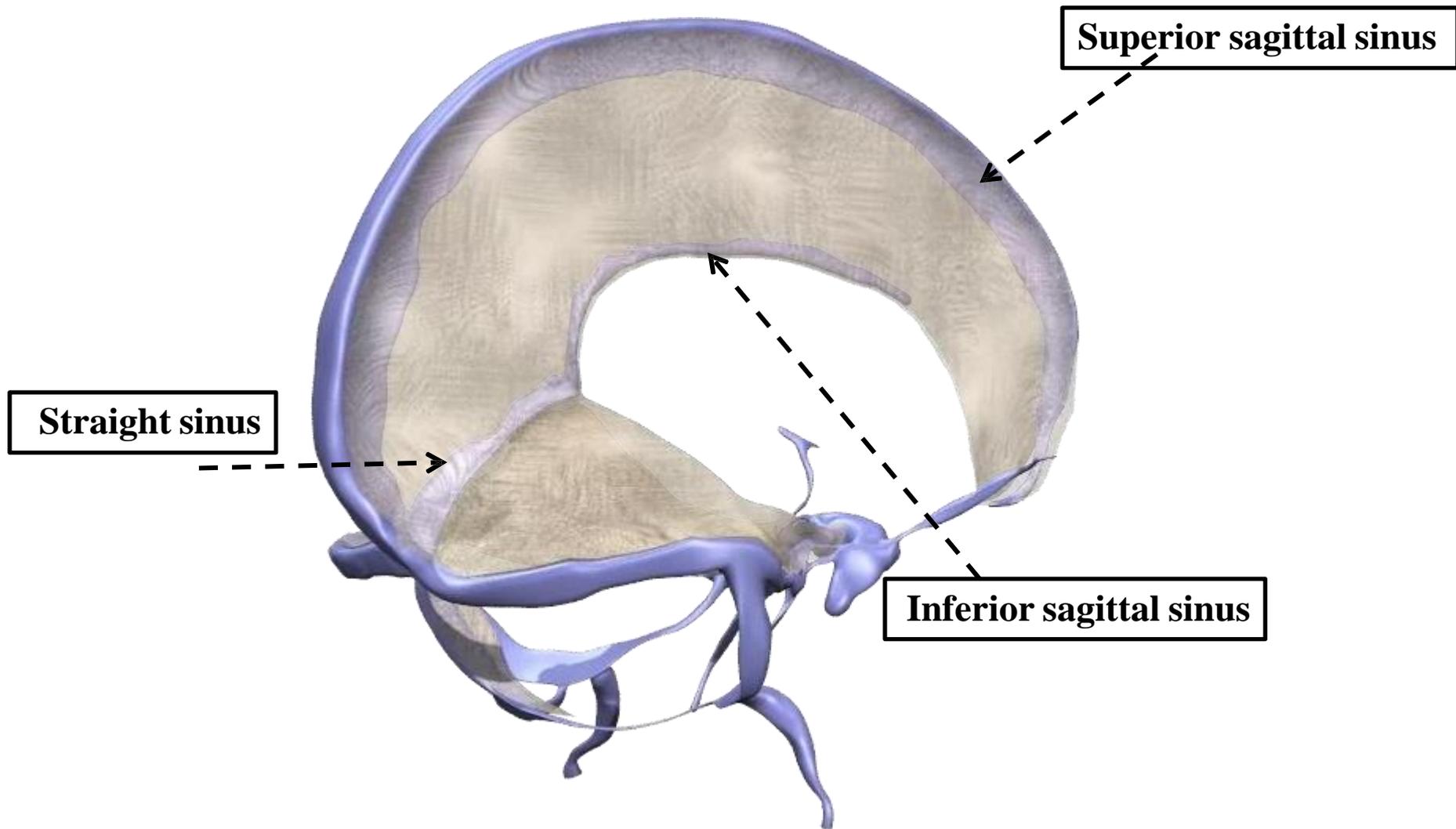
Diaphragma sellae

Is attached to the
clinoid processes

**Pituitary should be protected by this inside
sella turcica**



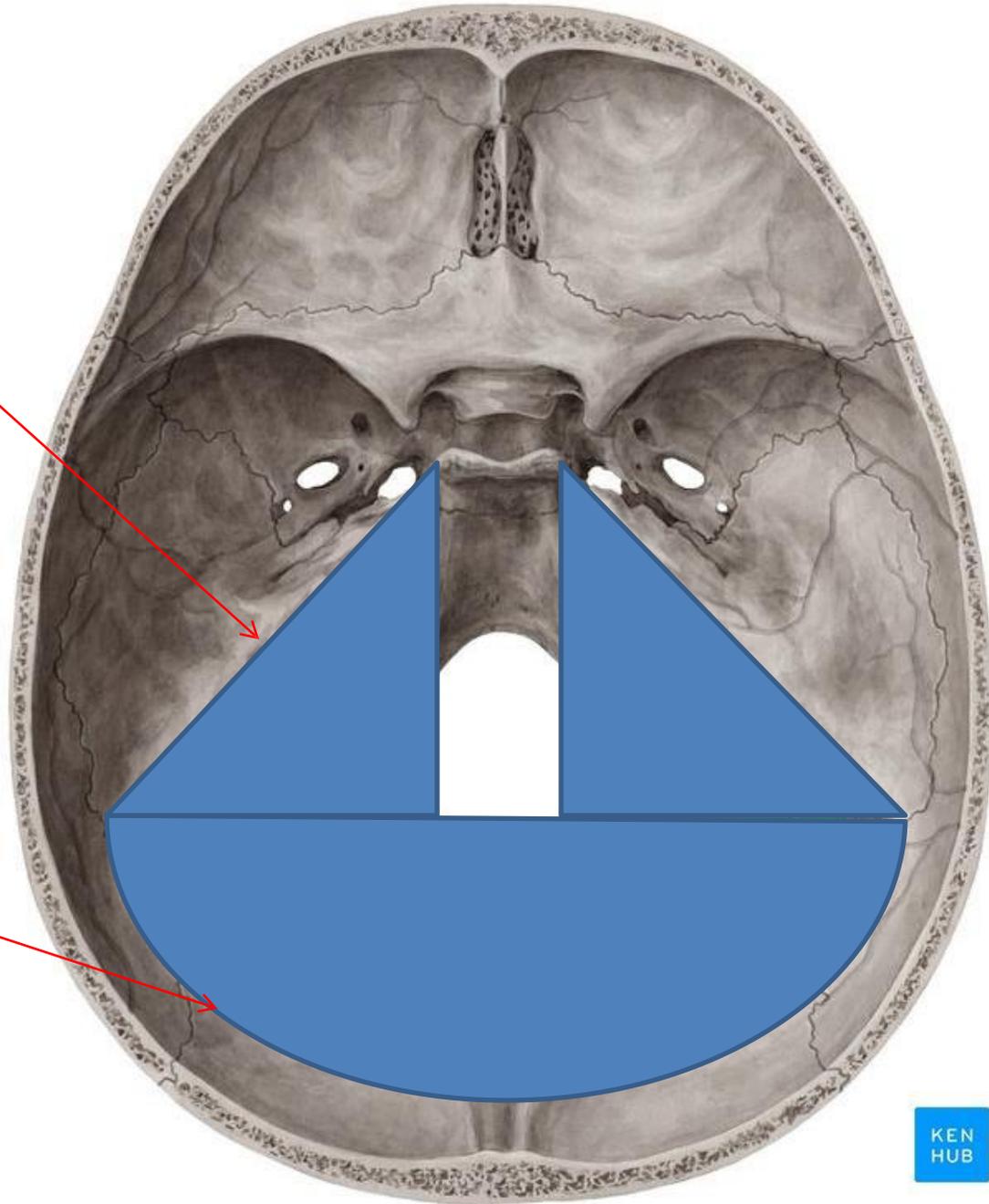
The falx cerebri and the falx cerebelli are attached to the upper and lower surfaces of the tentorium, respectively



The **superior sagittal sinus** runs in the **upper margin of falx cerebri** ➤
The **inferior sagittal sinus** runs in the **lower margin of falx cerebri** ➤
The **straight sinus** runs along the **falx cerebri attachment to the tentorium cerebelli** ➤

The **superior petrosal sinus** runs along the attachment of tentorium cerebelli to the superior border of petrous bone

The **transverse sinus** runs along the attachment of tentorium cerebelli to the occipital bone



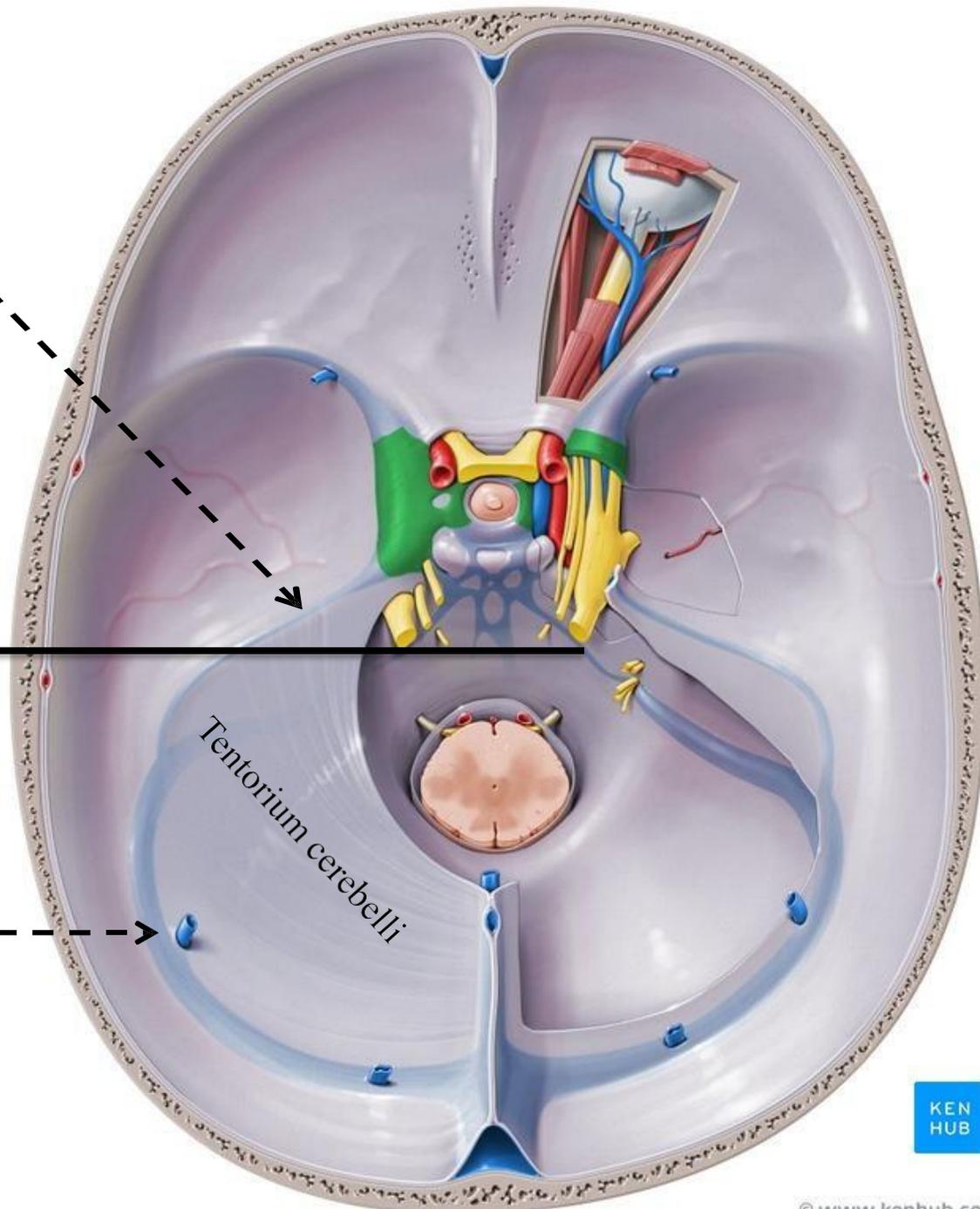
Superior petrosal sinus:

Since we have superior petrosal , we have inferior petrosal sinus

Inferior petrosal sinus : at the junction between the petrous bone and occipital bone and it passes through jugular foramen to drain into jugular vein outside the skull

Transverse sinus:

It continues as s shaped sinus called sigmoid which inter jugular foramen as internal jugular vein



The Venous Blood Sinuses

Associated with this folds venous sinuses

They are **intracranial** blood filled spaces

Run **between** the layers of the **dura mater** **or** **the dural fold**

They are **lined by endothelium**

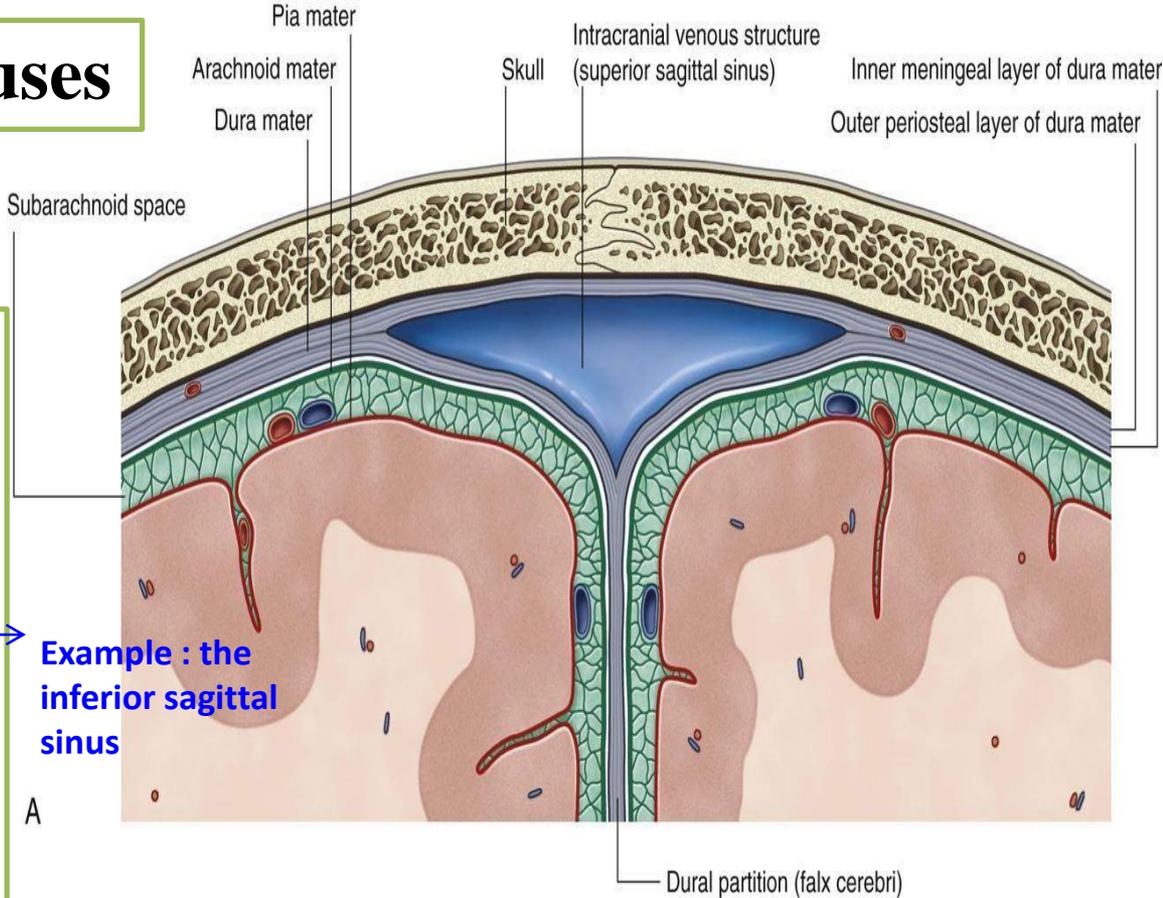
Their walls are thick and composed of fibrous tissue

Valveless → **Bidirectional movement**

They have no muscular tissue

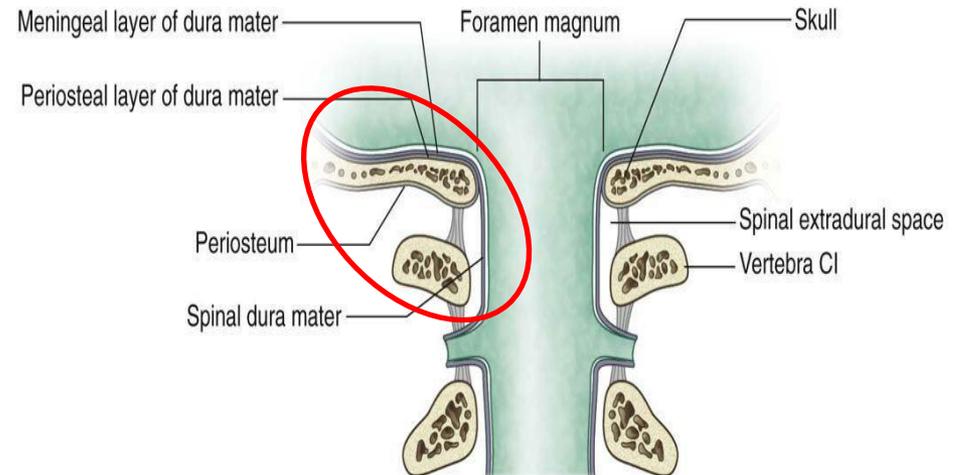
They receive tributaries from the brain, the diploe of the skull
Emissary veins, meninges, the orbit, and the internal ear

Eventually lead to internal jugular vein



Example : the inferior sagittal sinus

A



B

Some notes related to the previous slide :

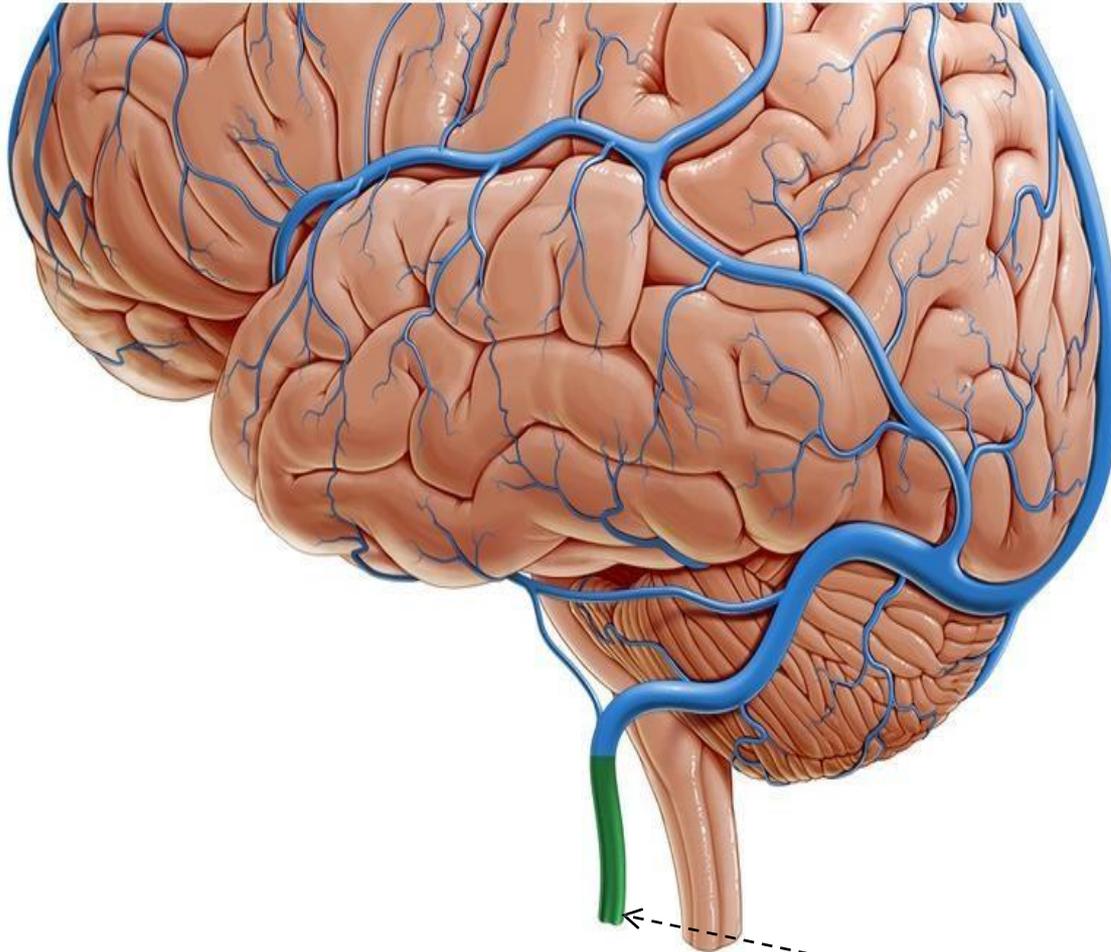
1) The periosteal layer of the dura mater at the level of foramen magnum continues with the periosteum covering the cranial bone

2)The meningeal layer of dura mater surrounds the spinal cords .

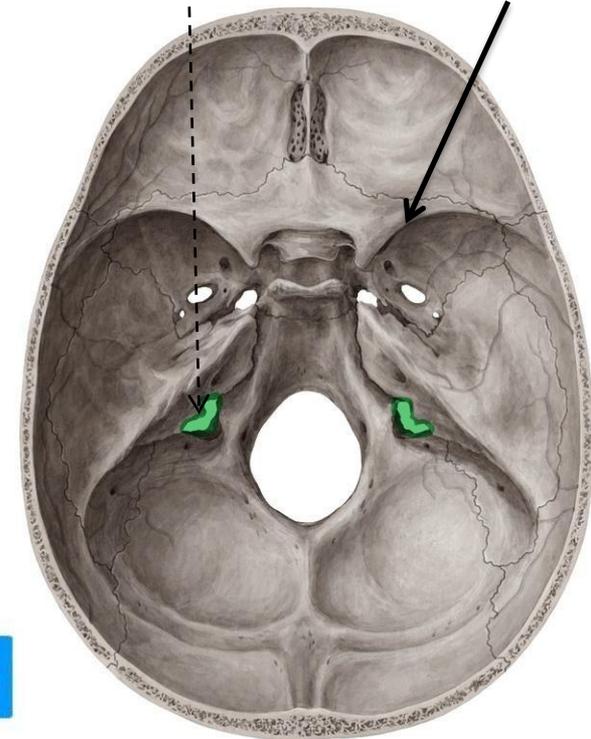
3) The cranial nerves have to peirce the three layer of meninges

**هدول الاعصاب بيسحبوا شوي من الطبقات هدول لمسافة قصيرة
بعدين الطبقات بكملاوا ك connective tissue**

The internal jugular vein leaves the skull by passing through jugular foramen



along the lesser wing of sphenoid there is a Sphenoparietal sinus



The internal jugular vein

We have cranial nerves passes through jugular foramen : 9/10/11

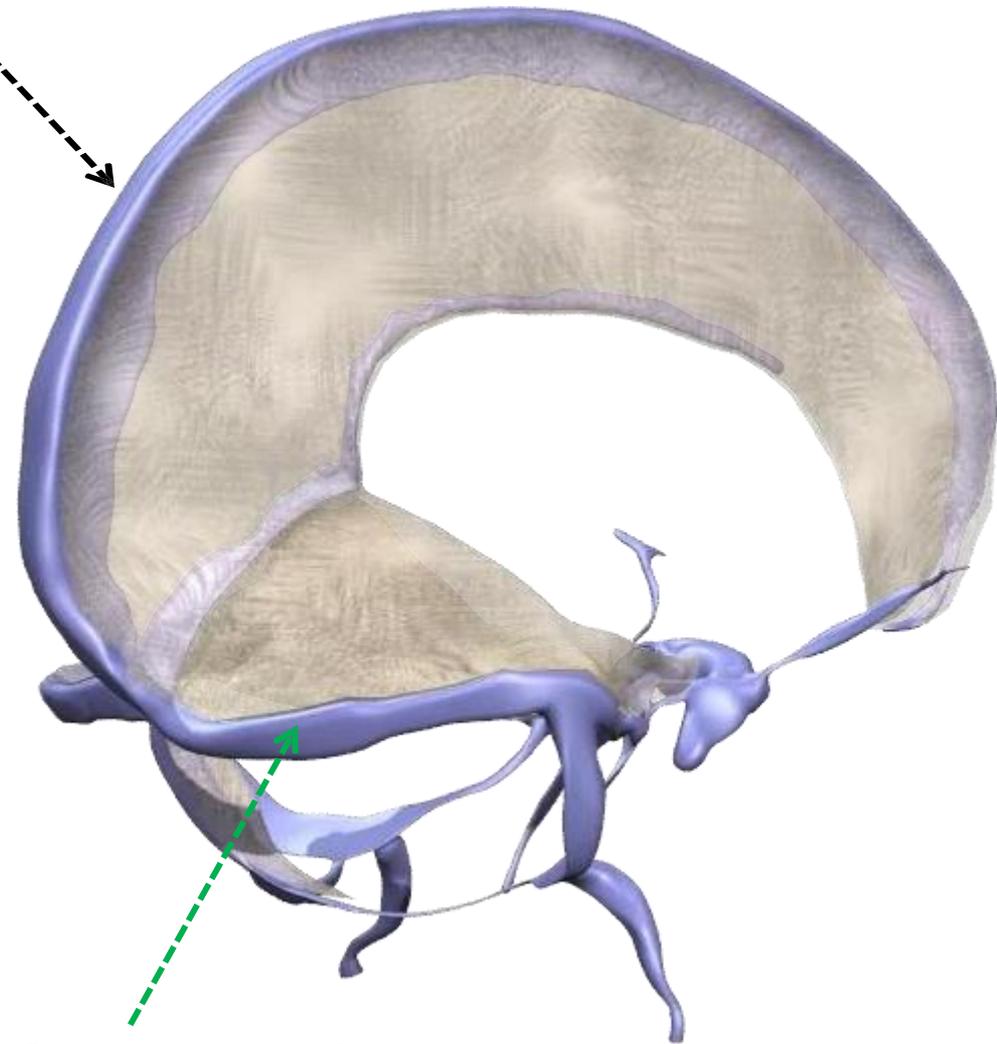
حتى ما تنسوهم تزكروا عمي ابو كرش وهو بعد للحد عش : تسعة عشرة احد عش بياكل ما بشبعش الا الساعة احد عش
Dr. Heba Kalbouneh

The superior sagittal sinus

It extends from crista galli to internal occipital protuberance

Lies in the upper fixed border of the falx cerebri

It becomes continuous with the right transverse sinus

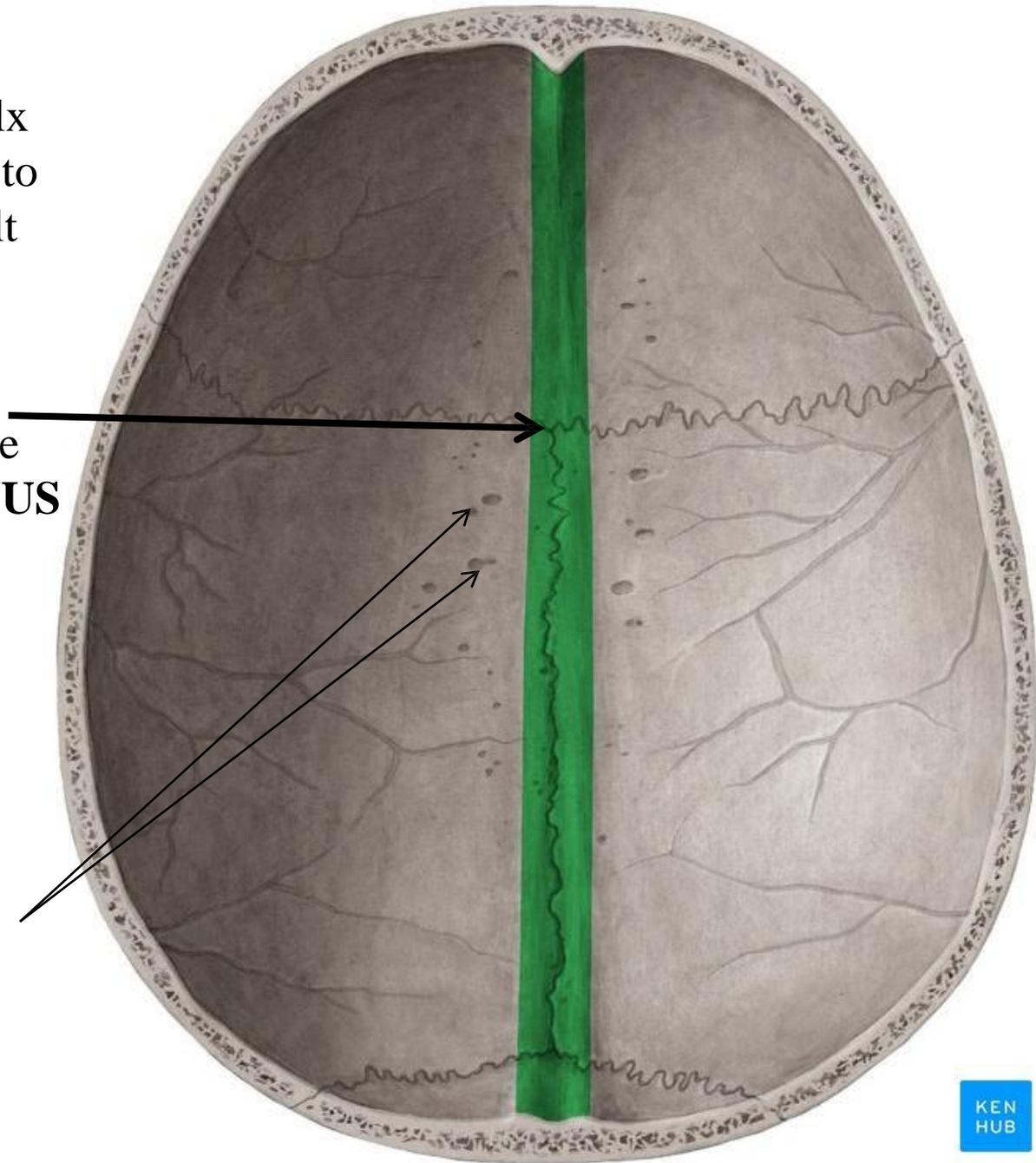


Right transverse sinus

The upper fixed border of falx cerebri is attached at midline to internal surface of skull vault

In the midline is a shallow sagittal groove containing the **SUPERIOR SAGITTAL SINUS**

On each side of the groove are several small pits, called **GRANULAR PITS**



The tributaries /venous drainages come from surrounding structure

The superior sagittal sinus

Receives

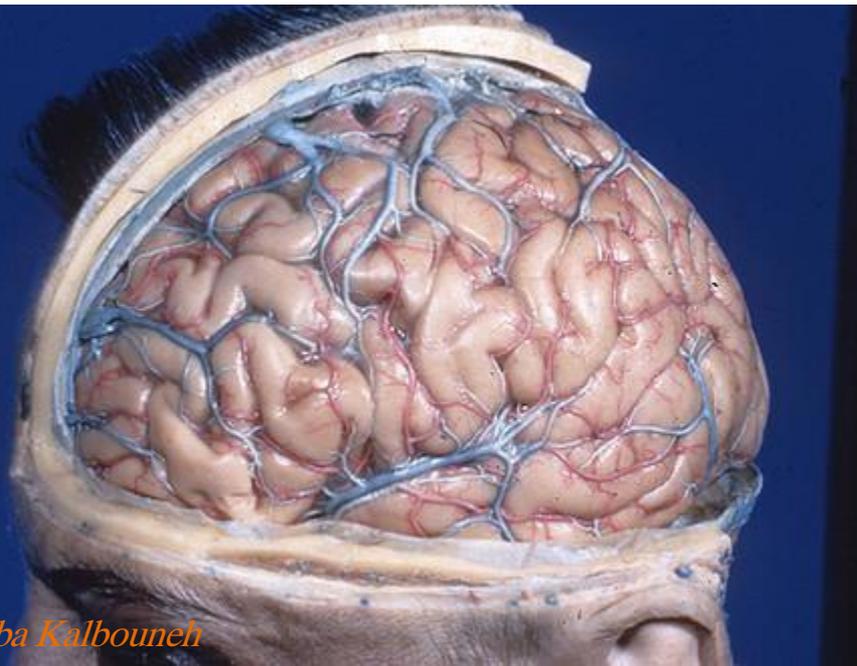
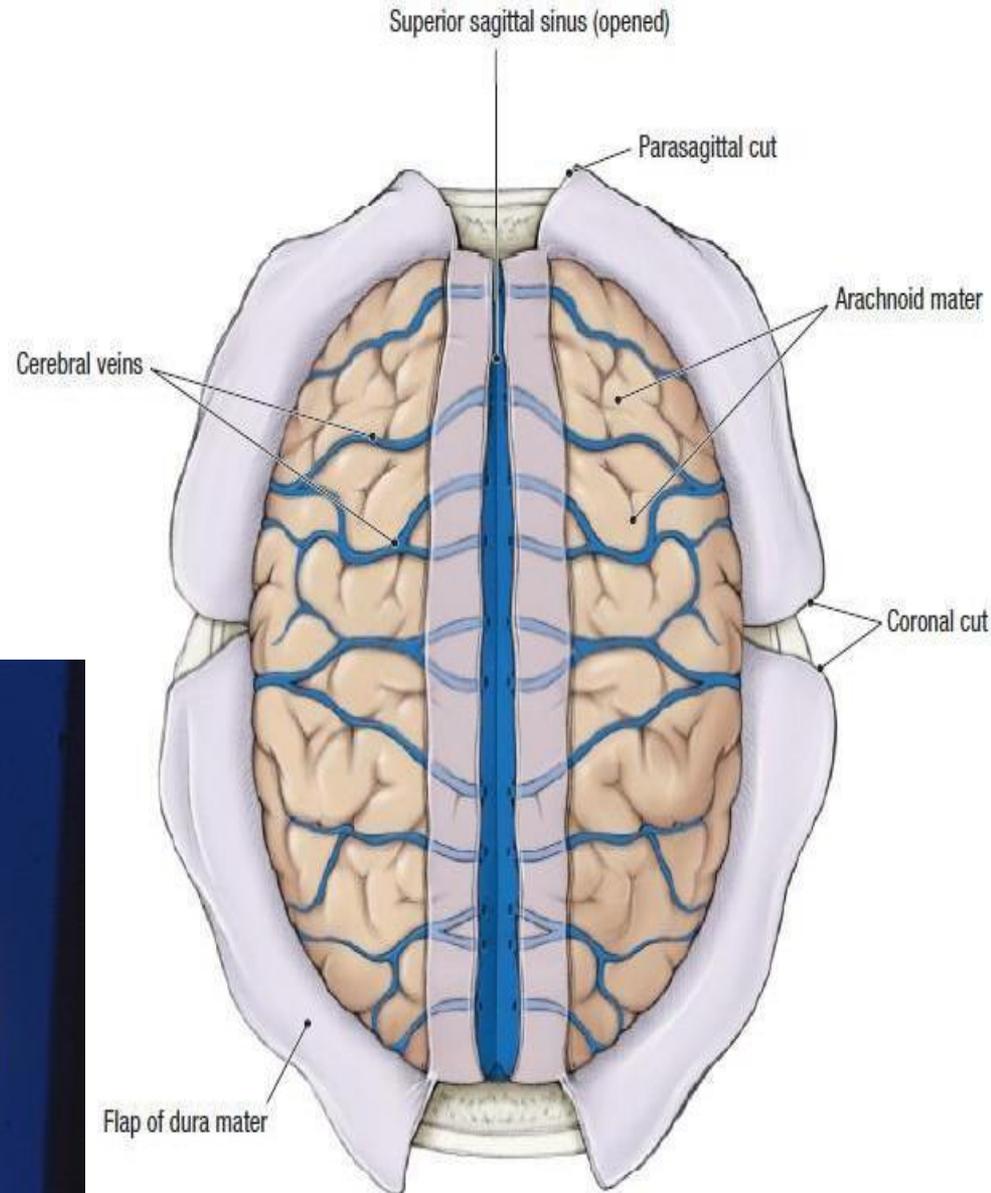
Superior cerebral veins -1

- Meningeal veins 2

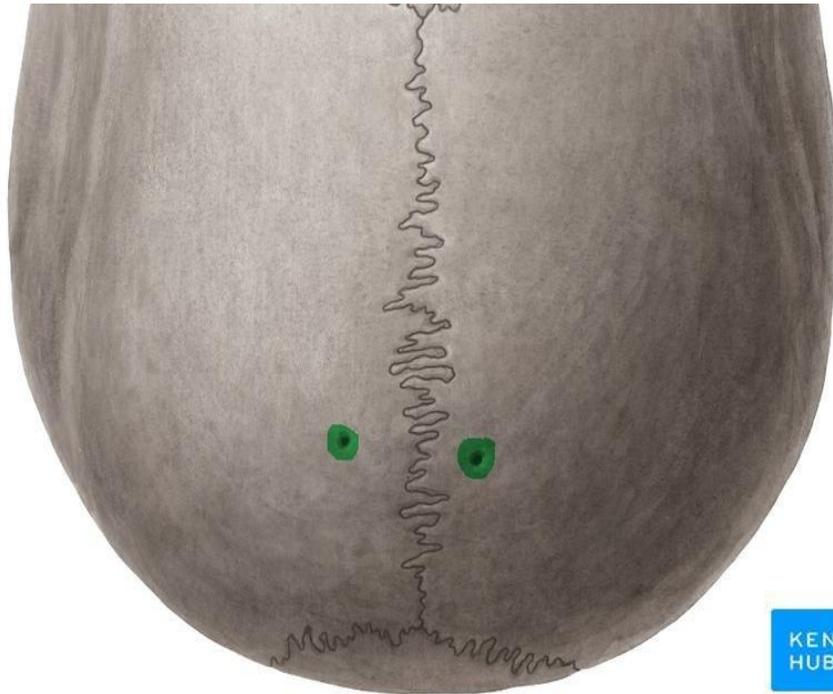
Two parietal emissary veins -3

- Emissary vein through foramen
cecum

Arachnoid villi -4

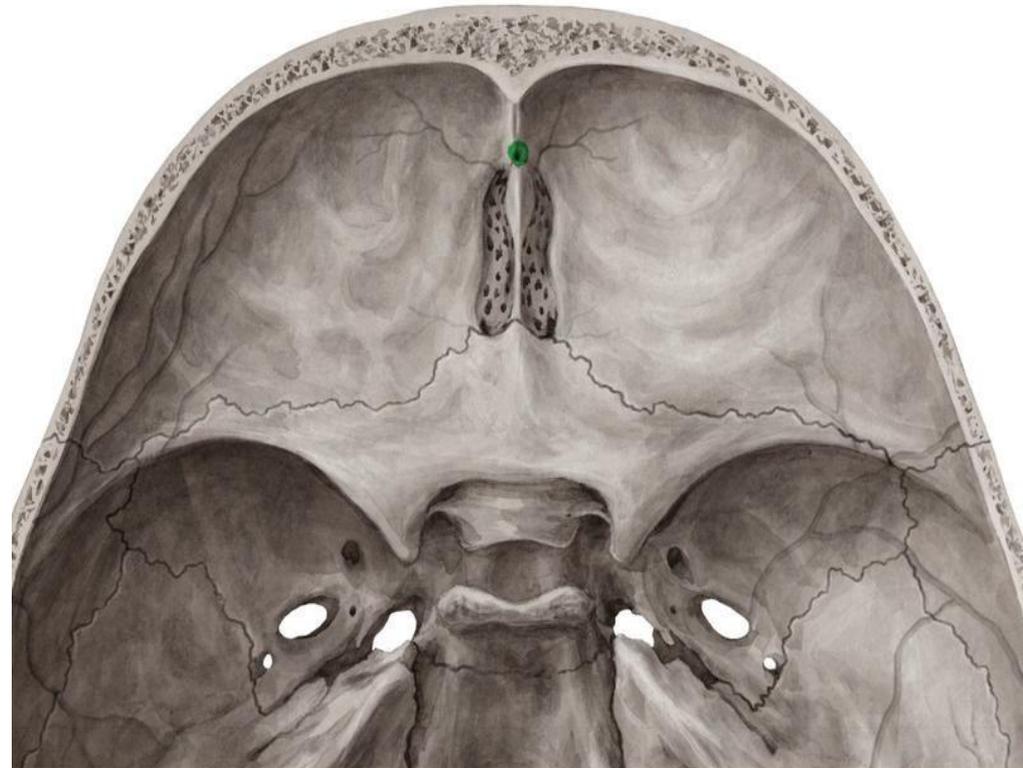


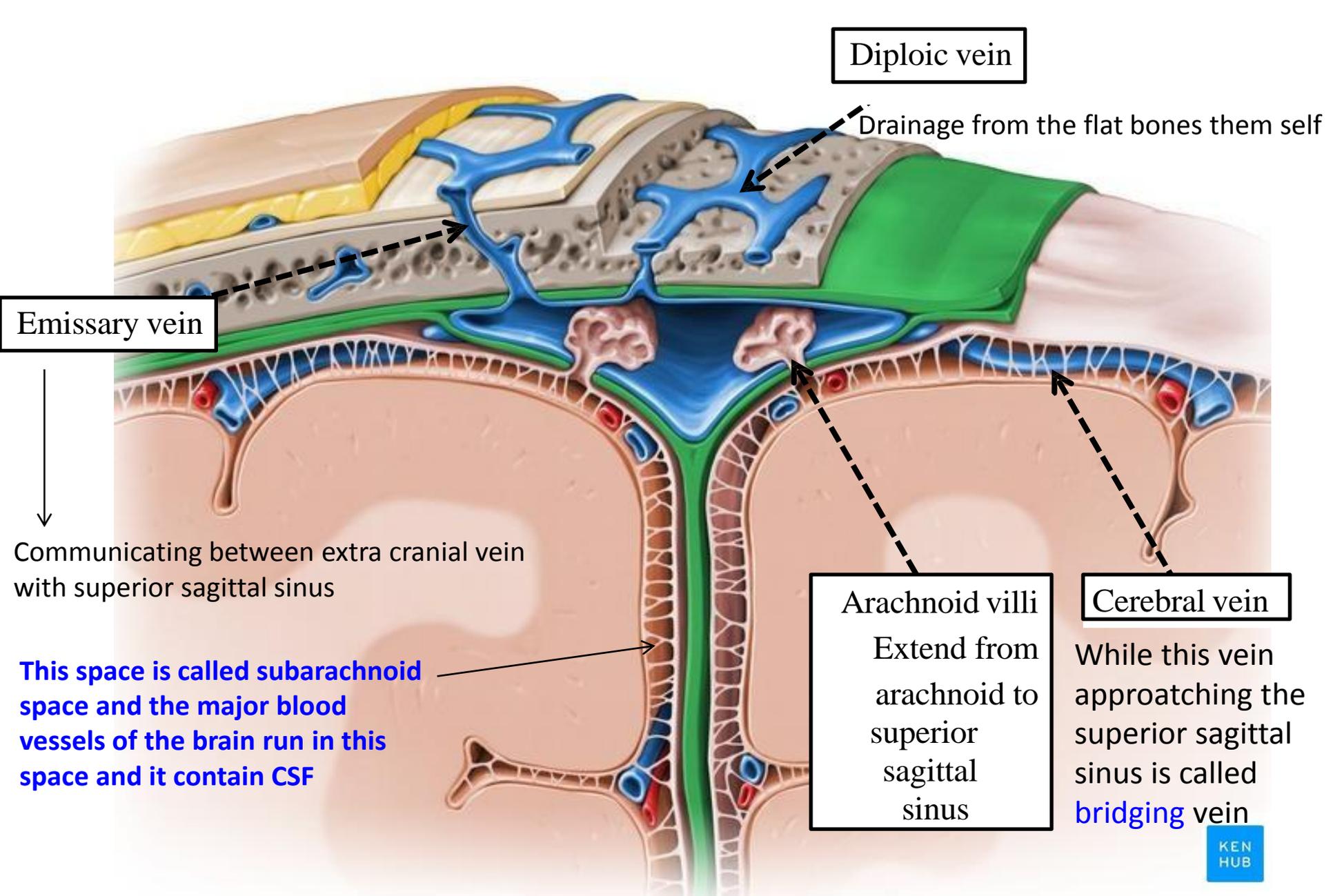
Parietal foramina transmit **emissary veins** from scalp to the superior sagittal sinus



Foramen caecum: may transmit emissary vein from the nose to the superior sagittal sinus (Cecum: blind)

سبب تسميتها لانه بالعادة بتكون مغلقة

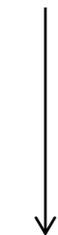




Diploic vein

Drainage from the flat bones them self

Emissary vein



Communicating between extra cranial vein with superior sagittal sinus

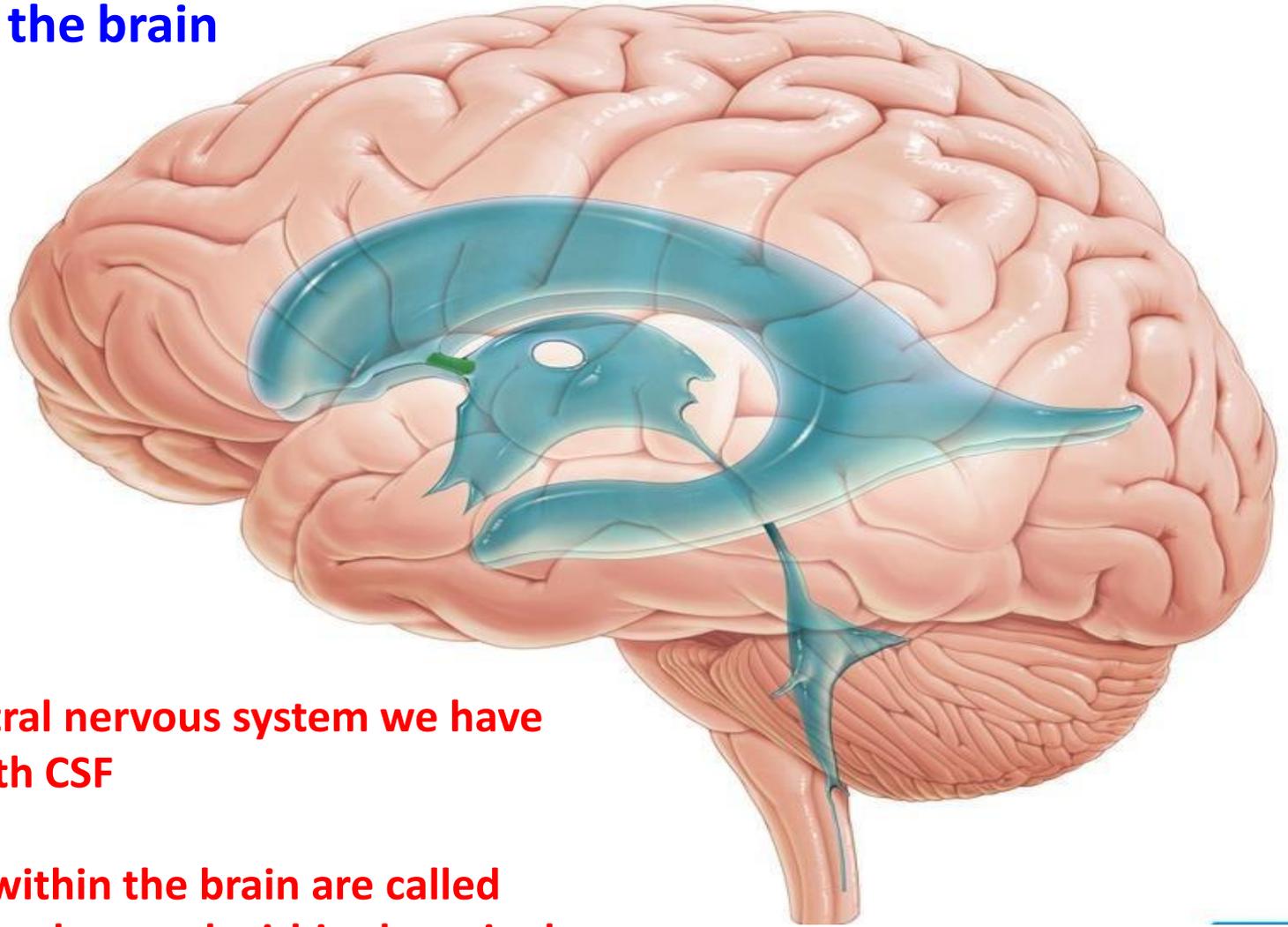
This space is called subarachnoid space and the major blood vessels of the brain run in this space and it contain CSF

Arachnoid villi
Extend from arachnoid to superior sagittal sinus

Cerebral vein
While this vein approaching the superior sagittal sinus is called **bridging vein**



Ventricles of the brain



Within our central nervous system we have spaces filled with CSF

**** the cavities within the brain are called ventricles , while the canal within the spinal cord is called central canal .**

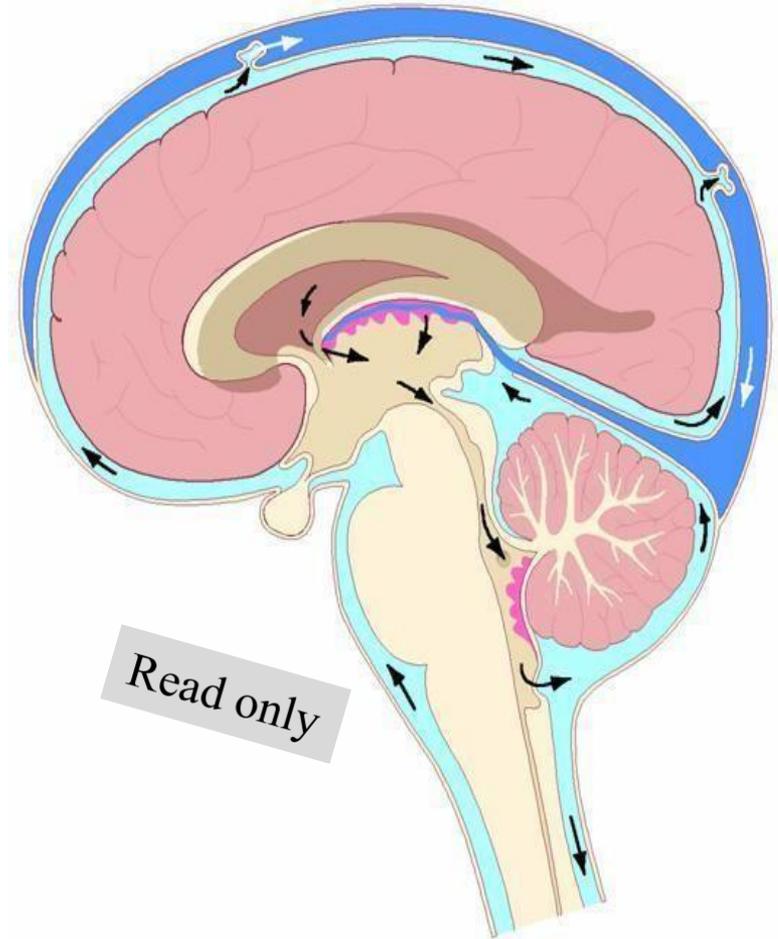
The cerebrospinal fluid (CSF) is produced within the ventricles of the brain.

It escapes from the ventricular system of the brain through the three foramina and so enters the subarachnoid space

It now circulates both upward over the surfaces of the cerebral hemispheres and downward around the spinal cord

Eventually, the fluid enters the bloodstream by passing into the arachnoid villi and diffusing through their walls

The spinal subarachnoid space extends down as far as the second sacral vertebra



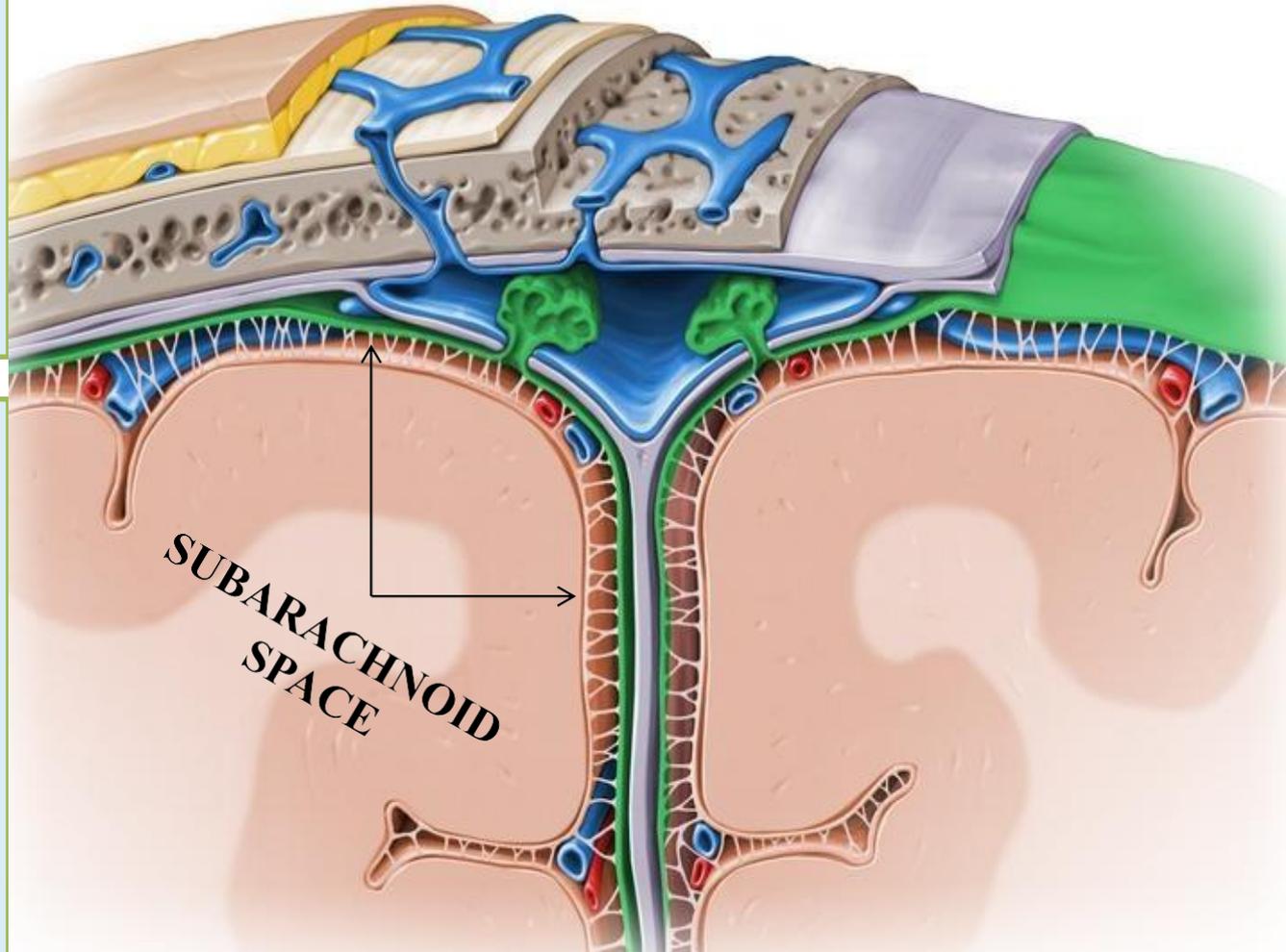
Notice that there is a communication between the subarachnoid space and the brain

- We produce CSF three times and drain it three times

Arachnoid Mater of the Brain

The arachnoid mater ➤ is a delicate membrane covering the brain and lying between THE PIA MATER INTERNALLY And THE DURA MATER EXTERNALLY

It is separated from the dura by a potential space THE SUBDURAL SPACE and from the pia by THE SUBARACHNOID SPACE which is filled with cerebrospinal fluid



Arachnoid Mater of the Brain

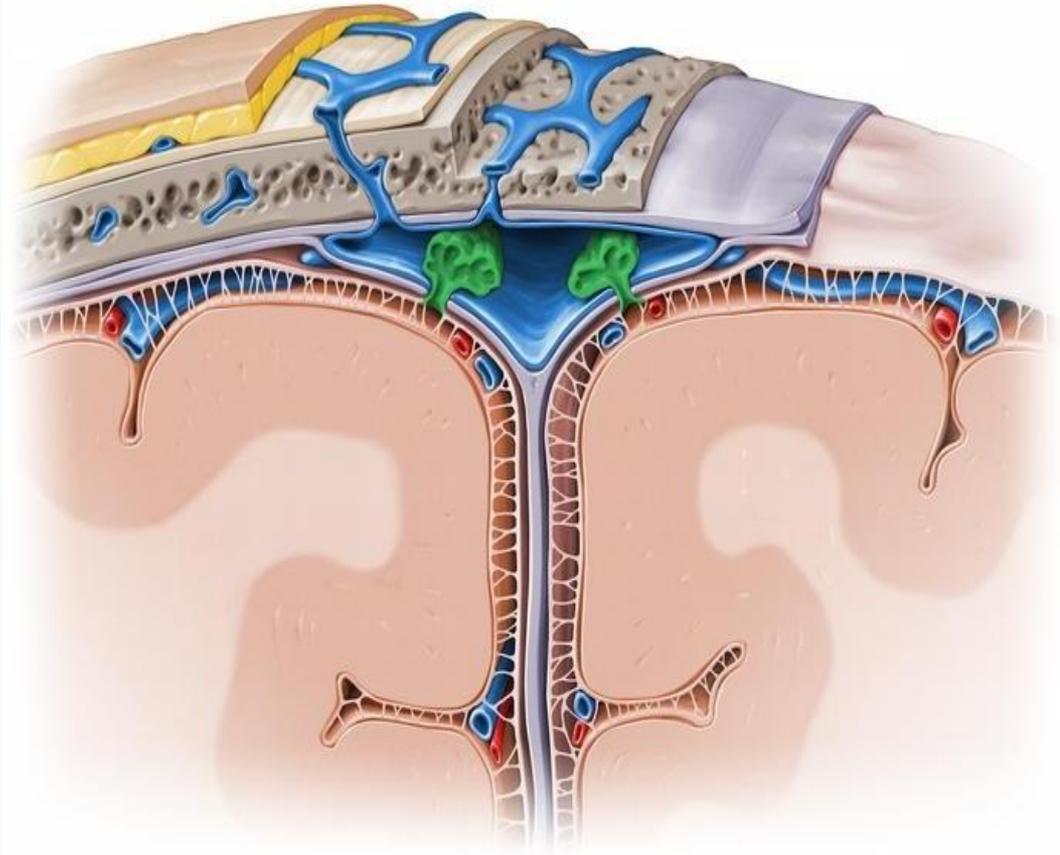
In certain areas the arachnoid projects into the venous sinuses to form arachnoid villi

The arachnoid villi are most numerous along the superior sagittal sinus

Aggregations of arachnoid villi are referred to as **arachnoid granulations**

Arachnoid villi serve as sites where the cerebrospinal fluid diffuses into the bloodstream

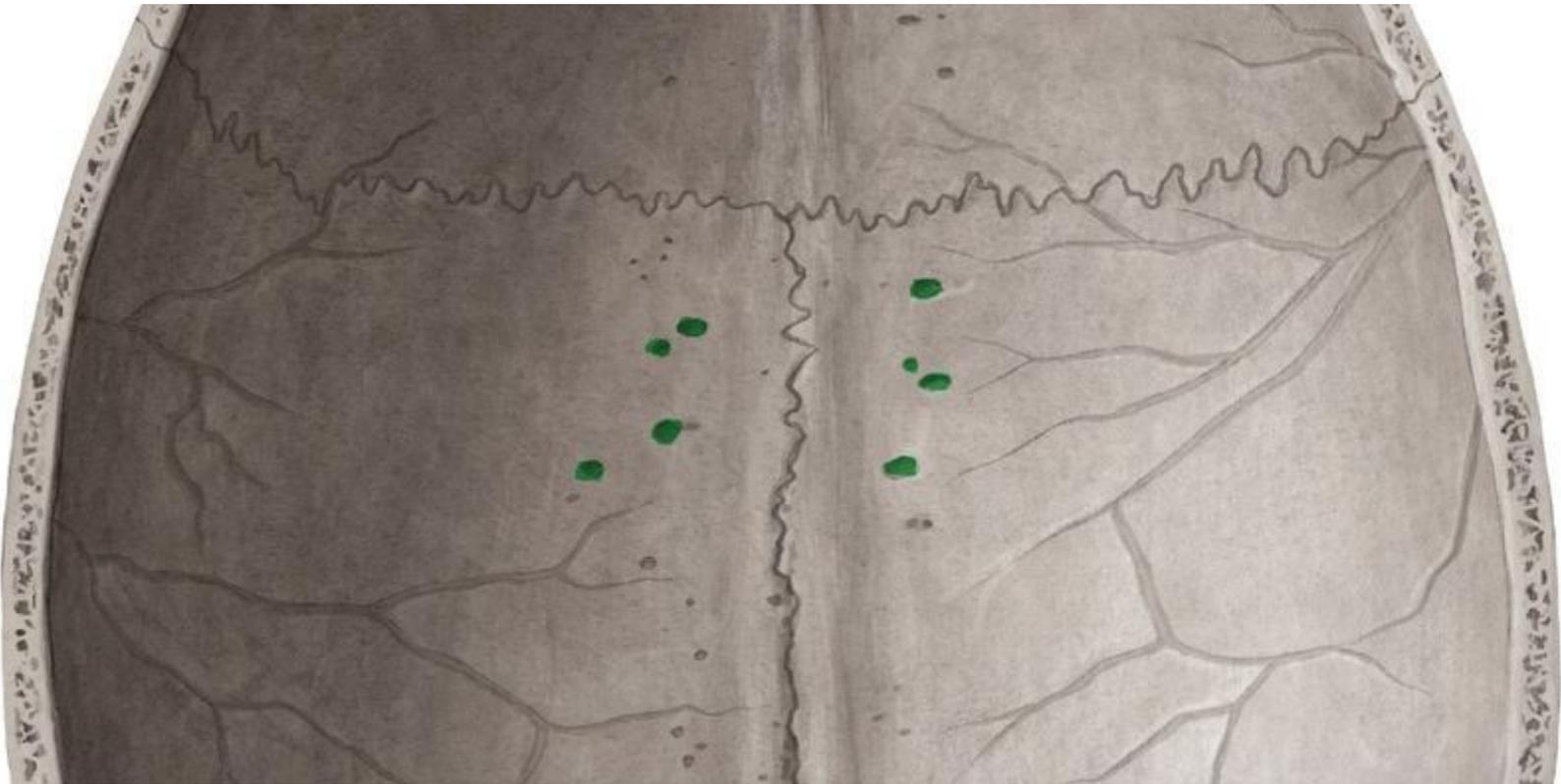
These granulations allow the movement of CSF from subarachnoid space to the superior venous sinus **but** they don't allow the movement of blood from the superior venous sinus to subarachnoid space.



On each side of the superior sagittal groove are
several small pits, called

GRANULAR PITS (Foveolae)

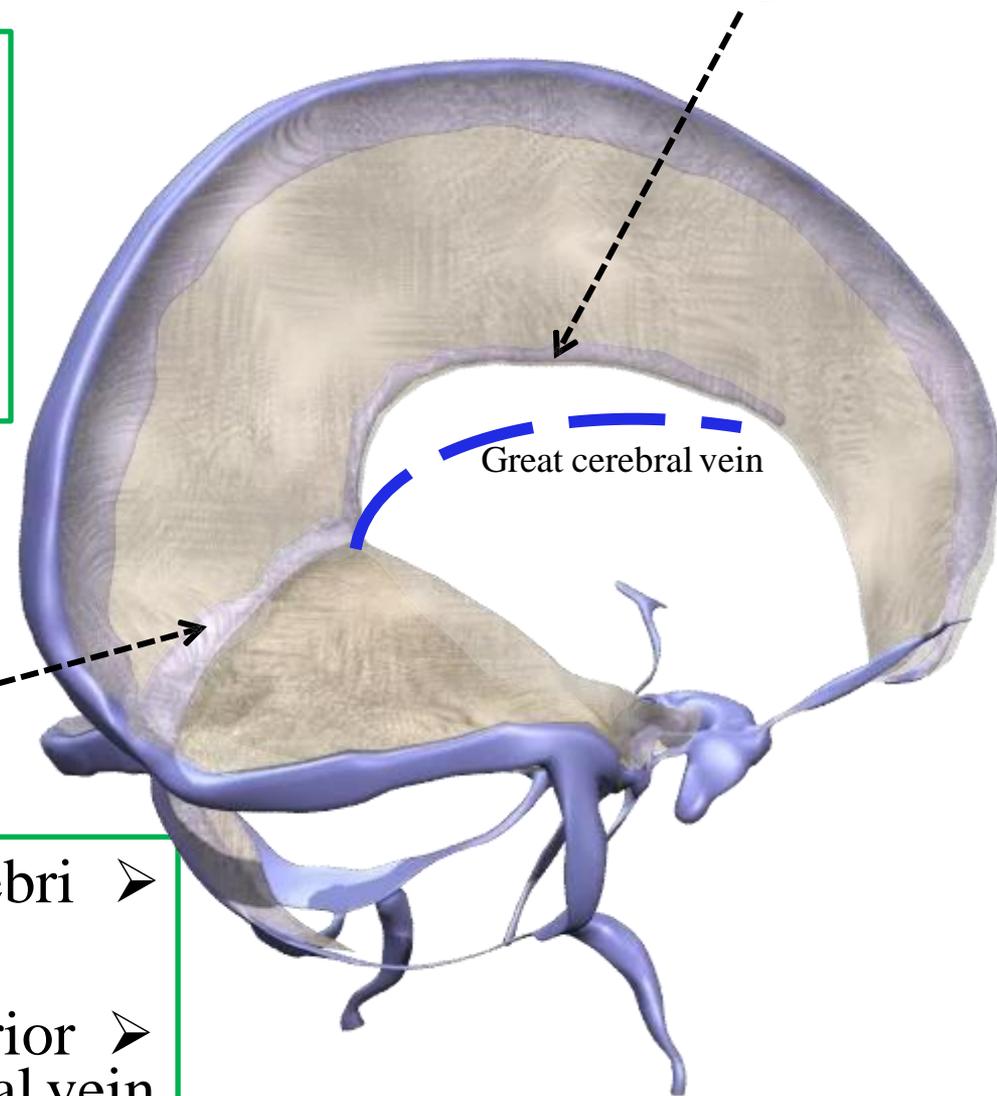
GRANULAR PITS are indentation of the
skull formed by arachnoid granulations



The inferior sagittal sinus

- Lies in the free lower margin of the falx cerebri
- It runs backward and joins the great cerebral vein to form the straight sinus

Inferior sagittal sinus



Great cerebral vein

The straight sinus

- Lies at the junction of the falx cerebri with the tentorium cerebelli
- Formed by the union of the inferior sagittal sinus with the great cerebral vein
- It drains into the left transverse sinus

The transverse sinus

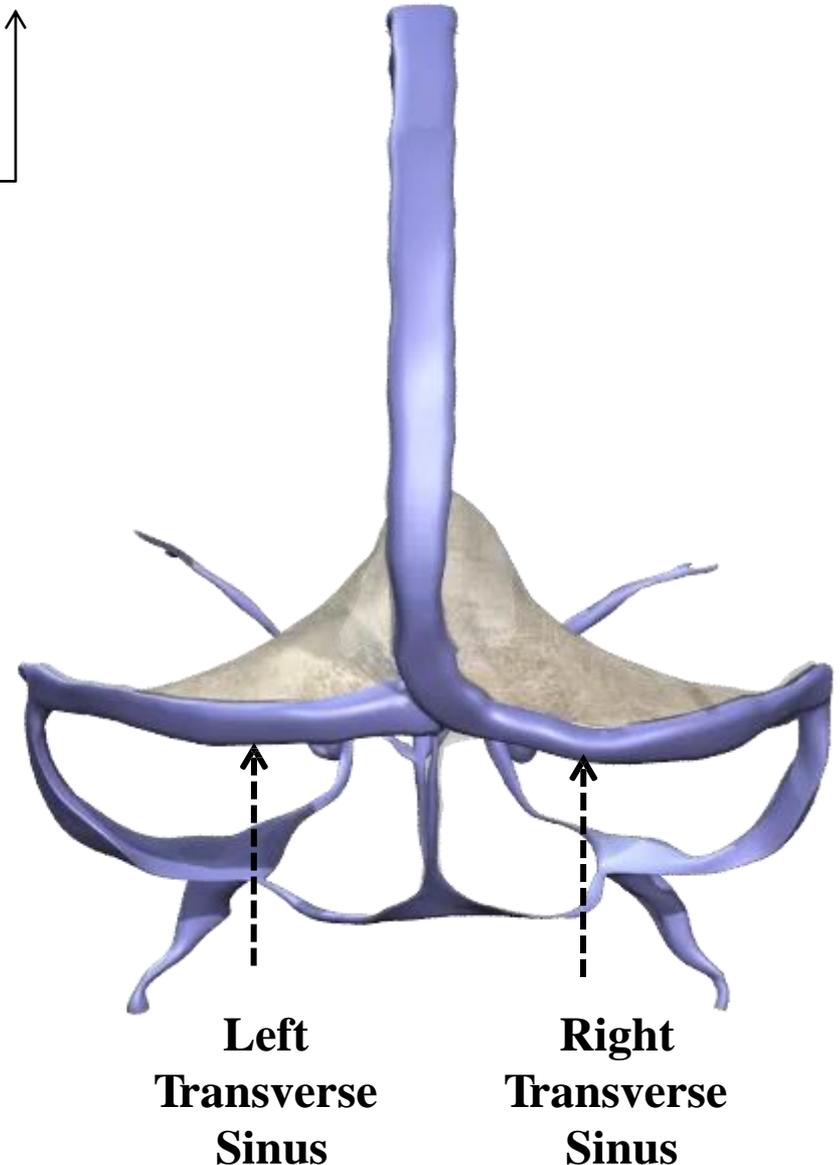
these two scenarios are the most common but there are other scenarios which are not important related to the high variation in venous circulation .

The **right transverse sinus** is **usually** a continuation of **superior sagittal sinus**

The **left transverse sinus** is **usually** a continuation of the **straight sinus**

Each transverse sinus lies along the attachment of tentorium cerebelli to the occipital bone

Each sinus ends by becoming the sigmoid sinus



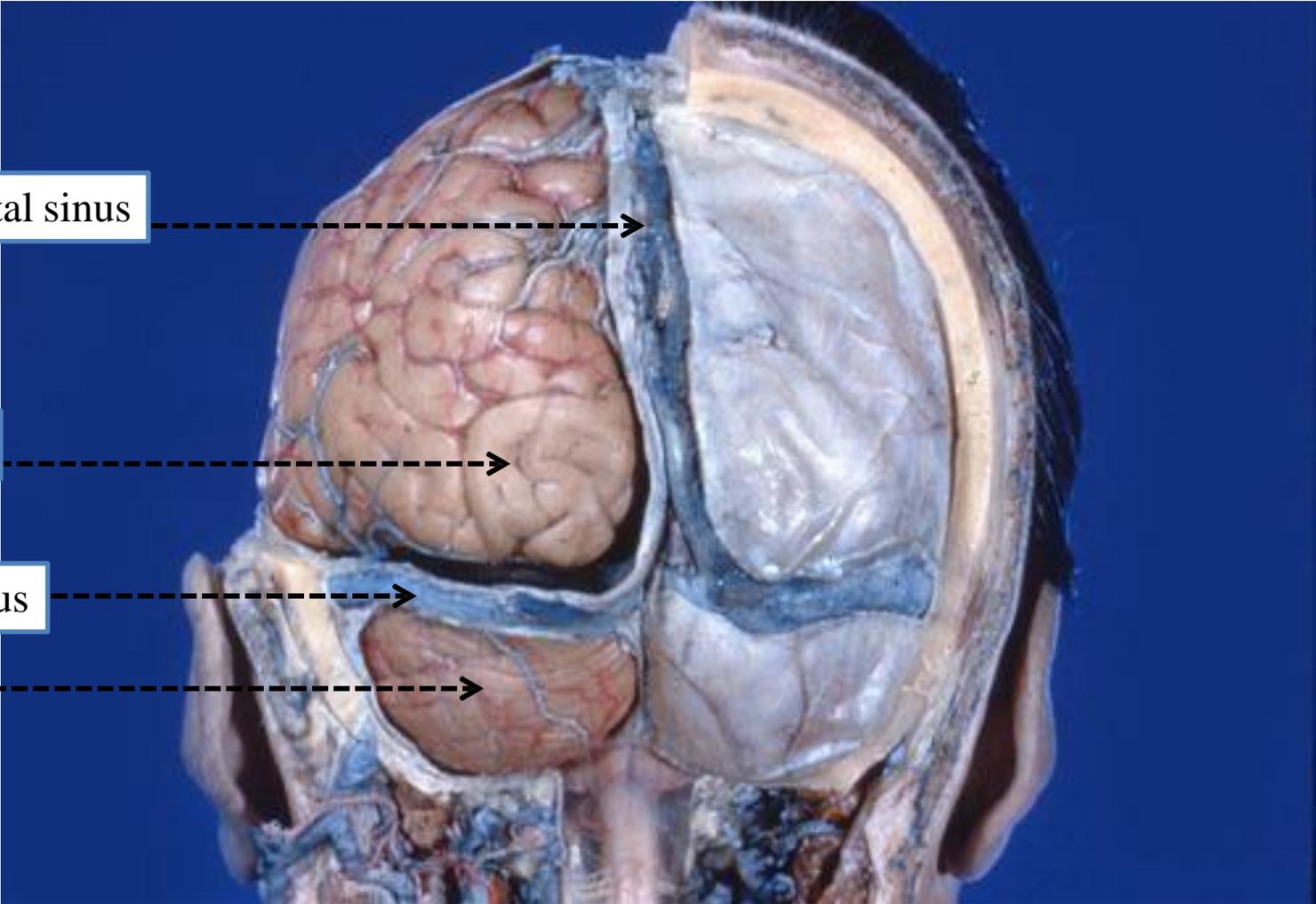
Posterior view

Superior sagittal sinus

Occipital lobe

Transverse sinus

Cerebellum

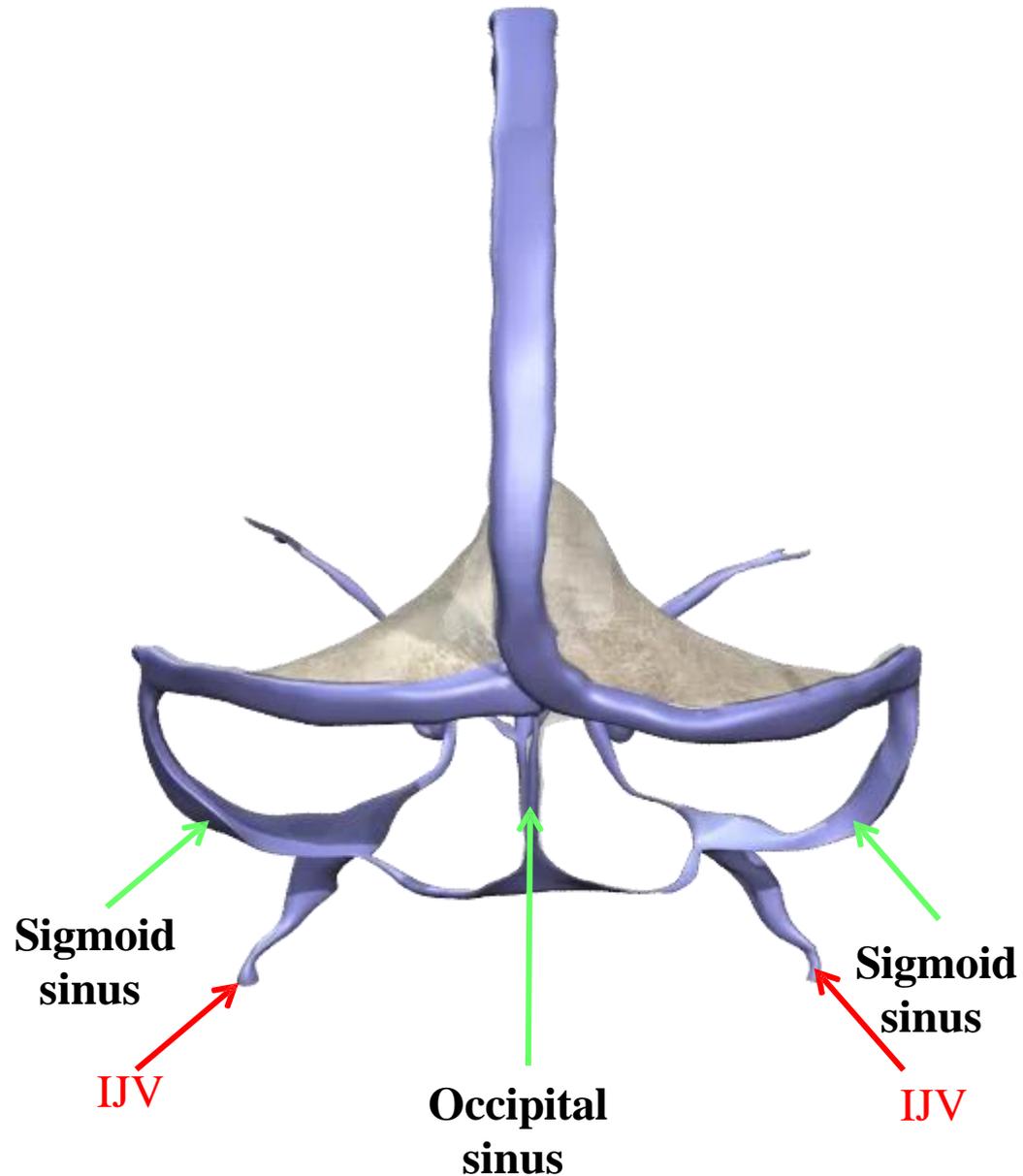


The sigmoid sinus

Left & Right ➤
Drains from the ➤
transverse sinus and superior
petrosal sinus and continues
as **internal jugular vein**

The occipital sinus

Lies in the attached margin
of the falx cerebelli



Sulcus for the Inf. Petrosal sinus

(Inferior border of petrous bone)

Sulcus for the Sup. Petrosal sinus

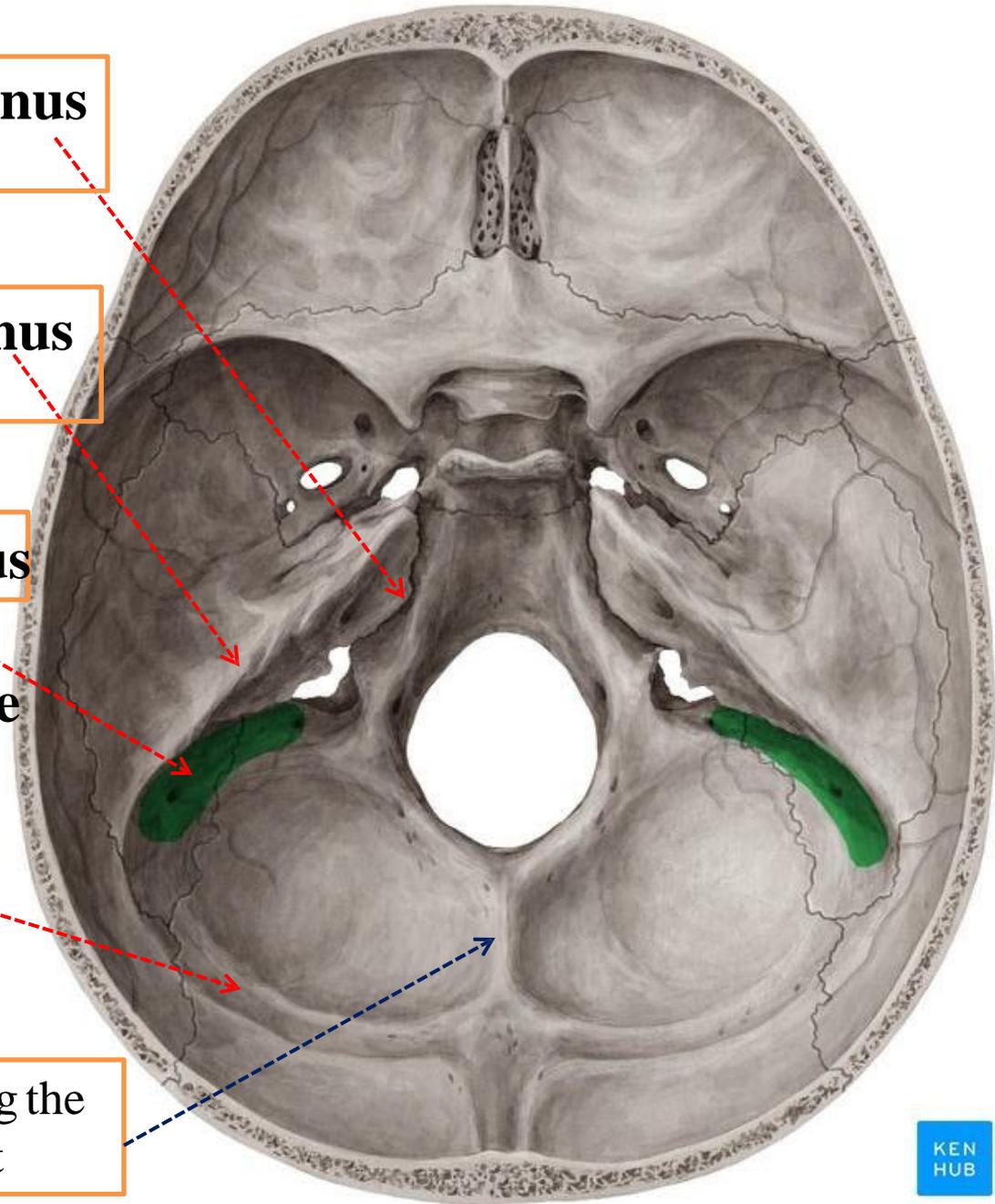
(Superior border of petrous bone)

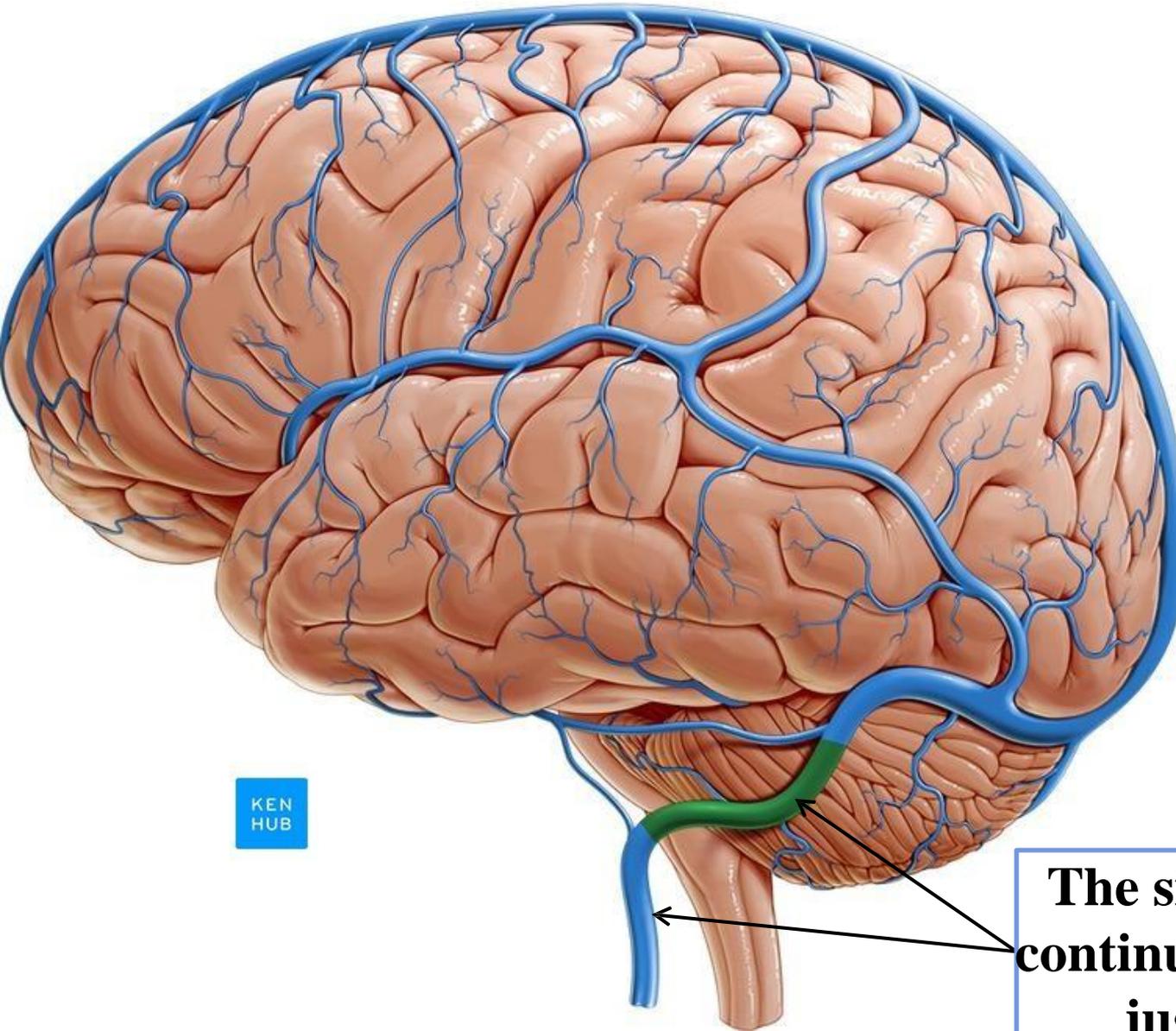
Groove for the sigmoid sinus

Groove for the transverse sinus

(On each side of the internal occipital protuberance)

Occipital sinus runs along the internal occipital crest

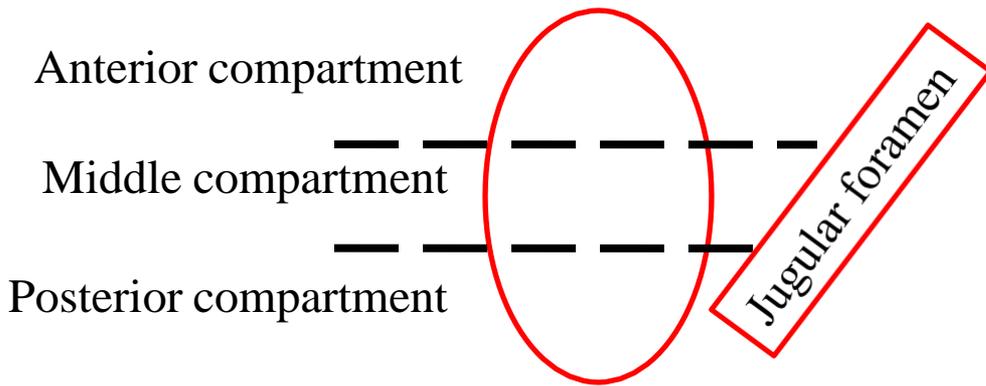




KEN
HUB

- Superior sagittal sinus----right transverse sinus
- -Inferior sagittal sinus straight sinus---- left-- transverse sinus
- Transverse sinus + =superior petrosal sinus sigmoid sinus
- Inferior petrosal sinus drains directly into internal jugular vein

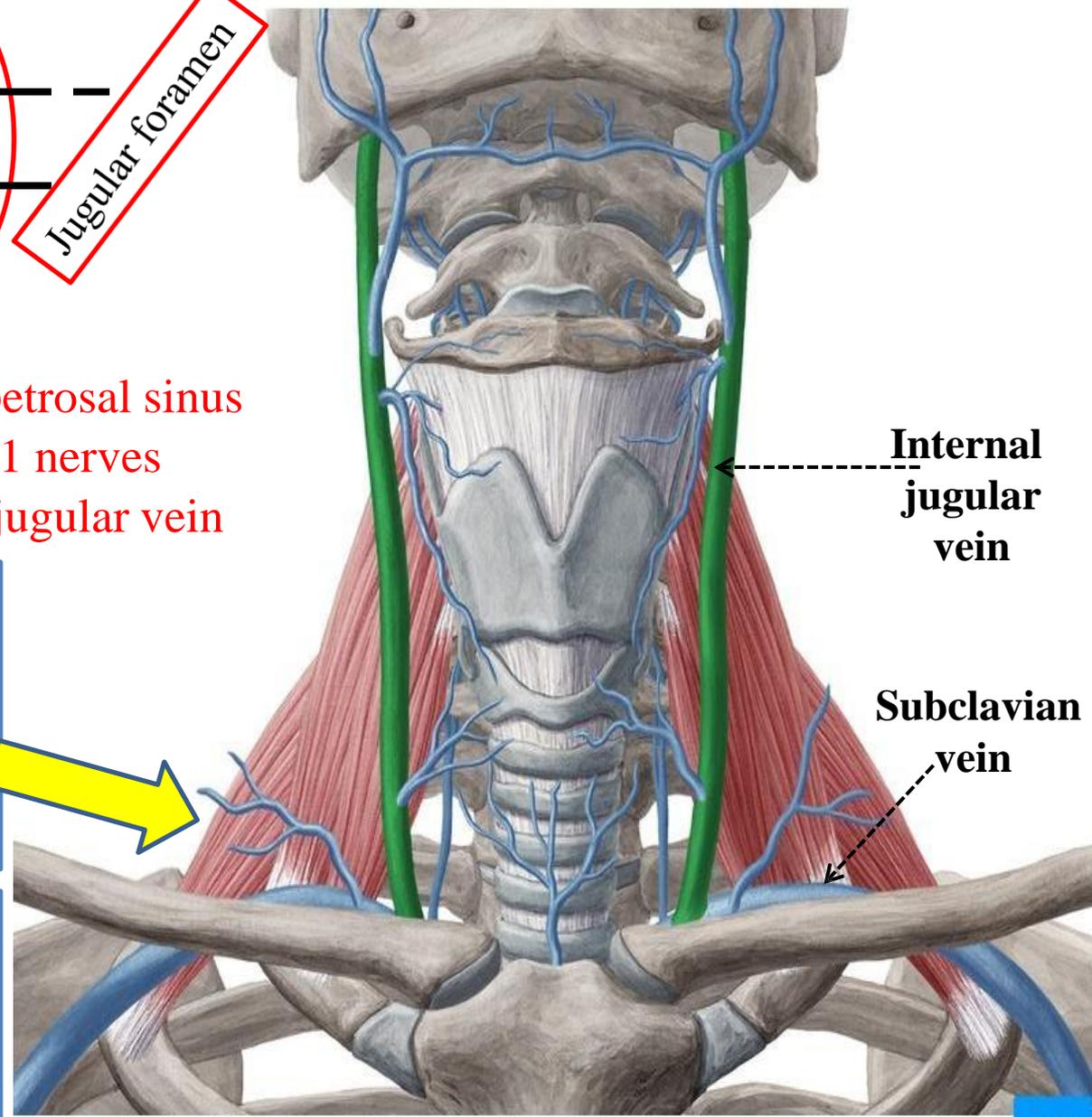
The sigmoid sinus continues as internal jugular vein

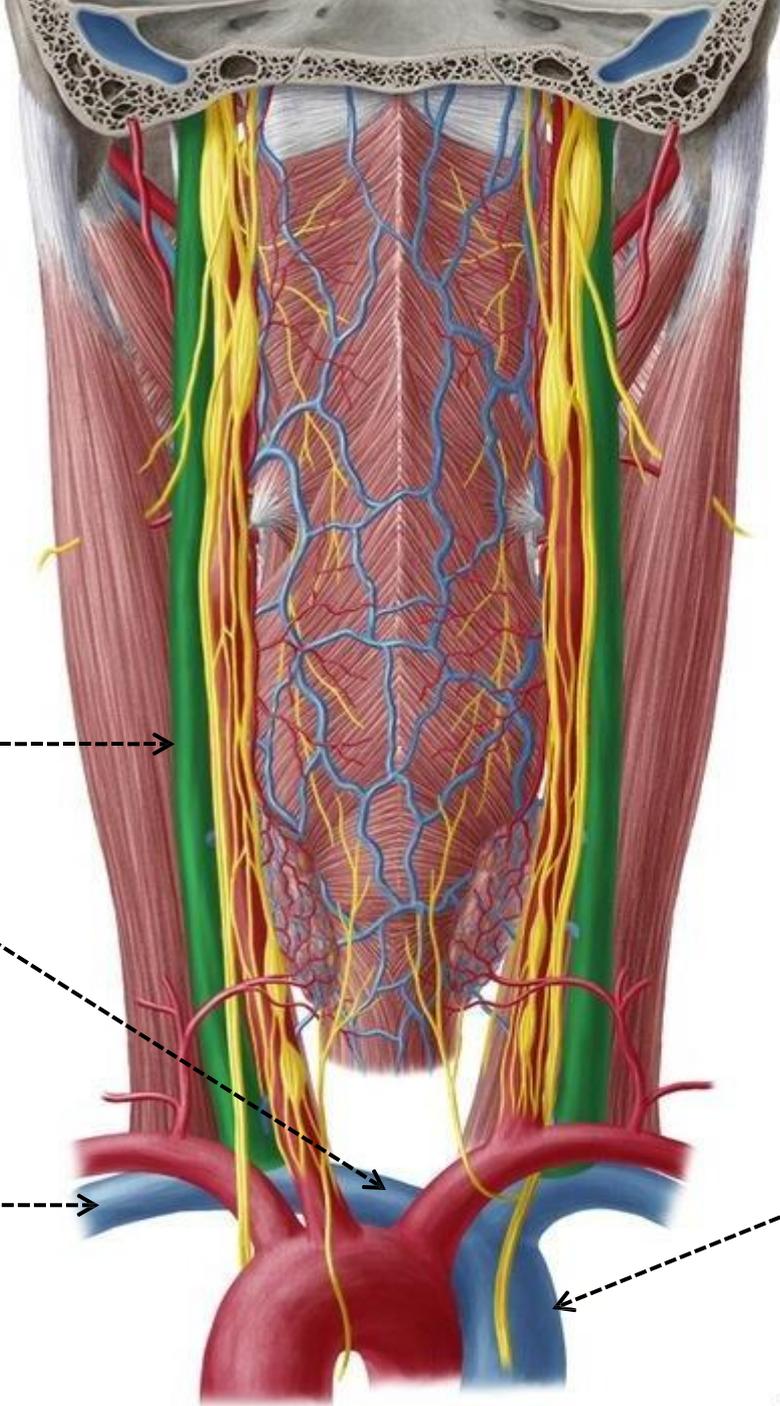


Anterior compartment : inferior petrosal sinus
 Middle compartment : 9,10 and 11 nerves
 Posterior compartment : internal jugular vein

At the root of the neck,
 internal jugular vein unites
 with the subclavian vein
 to form the
brachiocephalic vein

Right and left
 brachiocephalic veins unite
 to form the **superior vena
 cava**

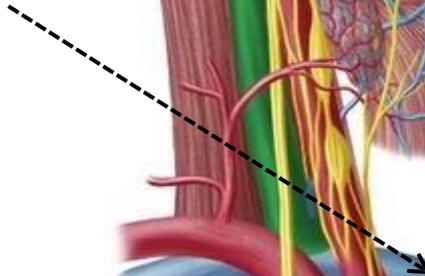




Internal jugular vein



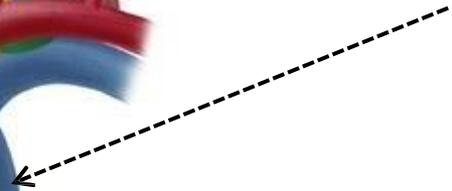
Brachiocephalic vein

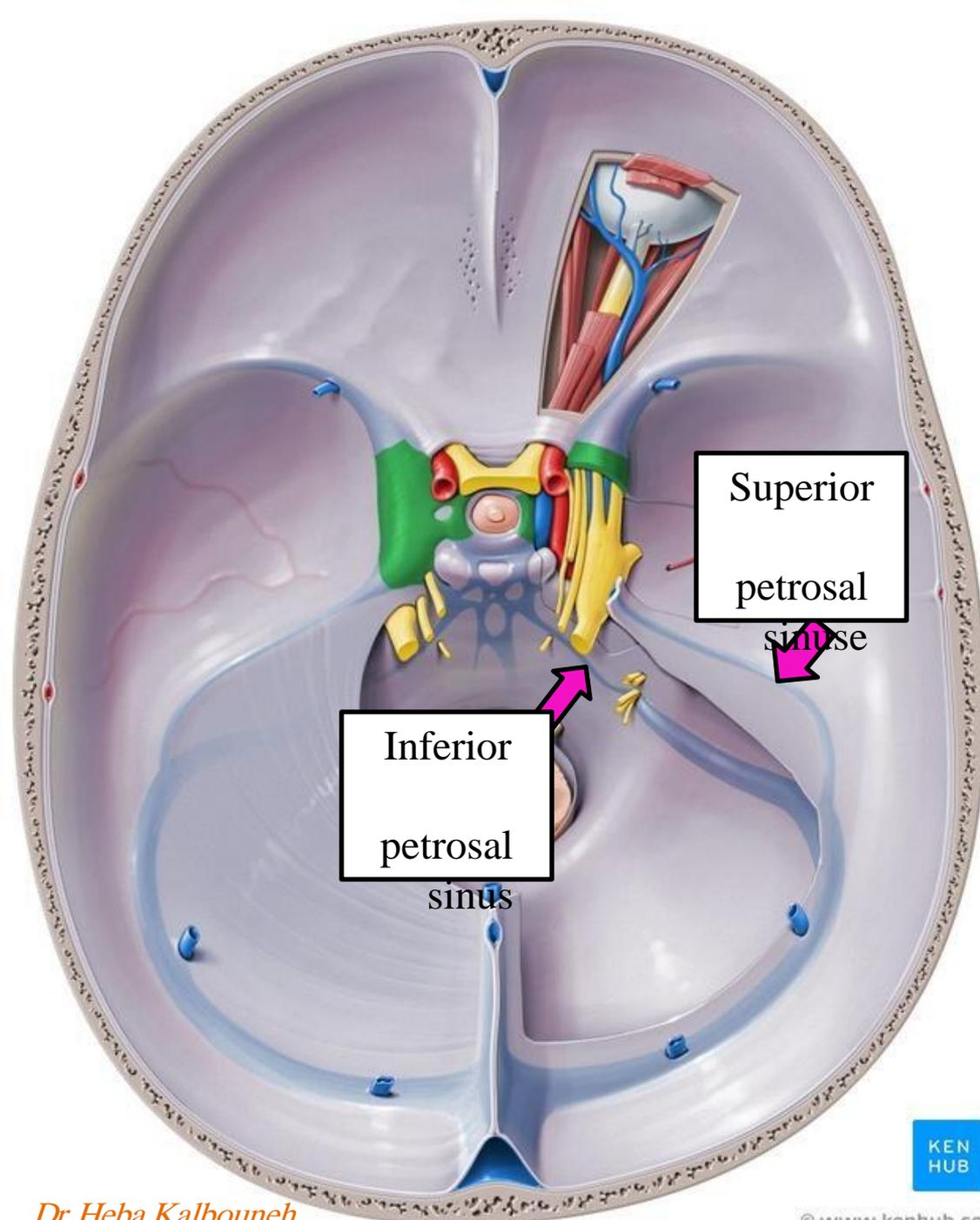


Subclavian vein



Superior vena cava





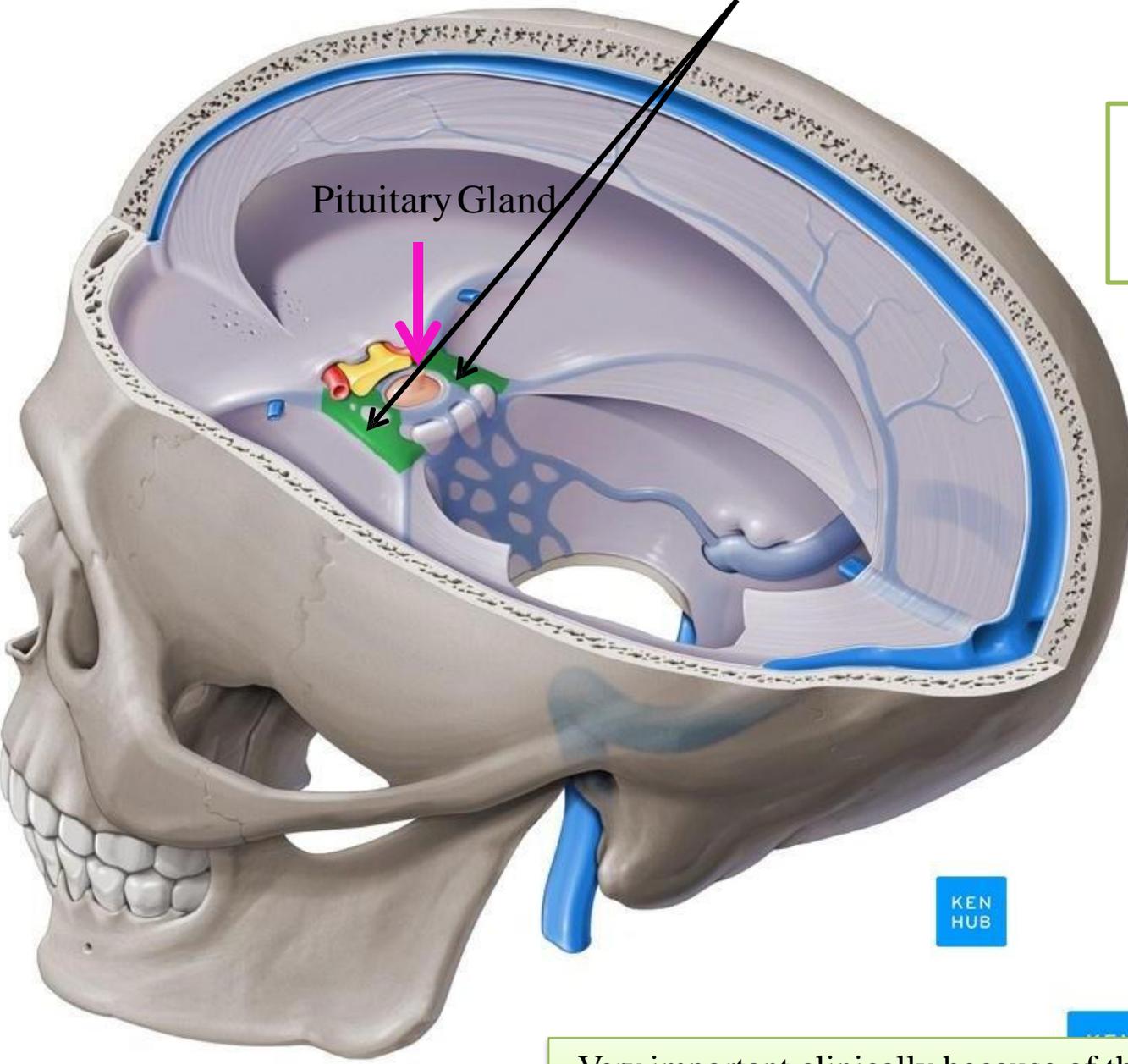
Note

The **superior petrosal sinus** runs along the upper border of the petrous part of the temporal bone

The **inferior petrosal sinus** runs along the lower border of the petrous part of the temporal bone

Most important intracranial venous sinuses

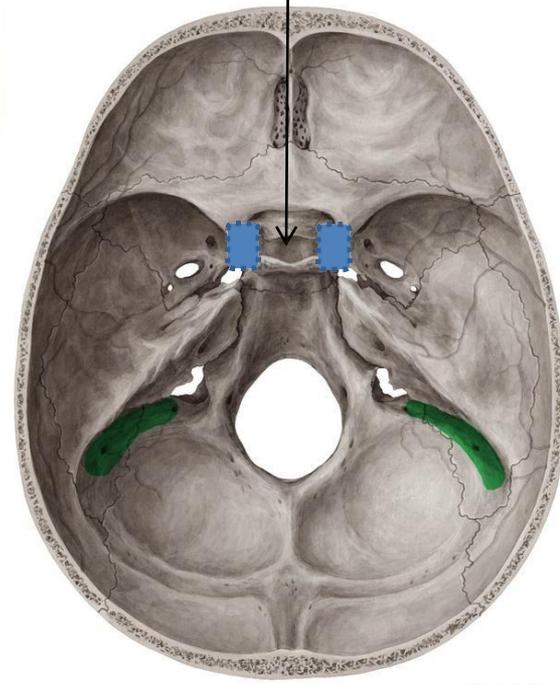
Cavernous sinuses



Pituitary Gland

KEN HUB

Lies on the lateral side of the **body of the sphenoid bone**

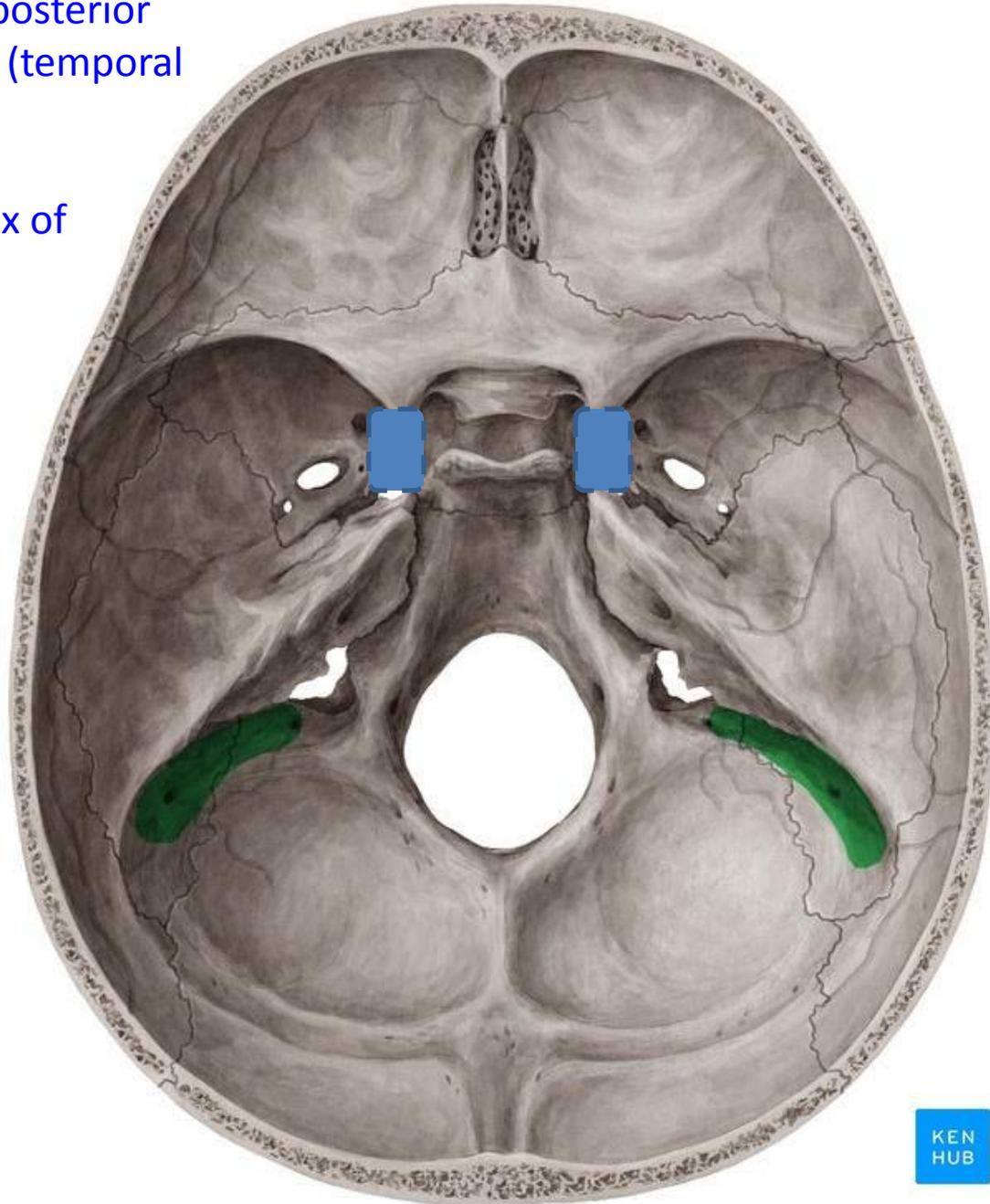


Very important clinically because of their connections and the structures pass through them

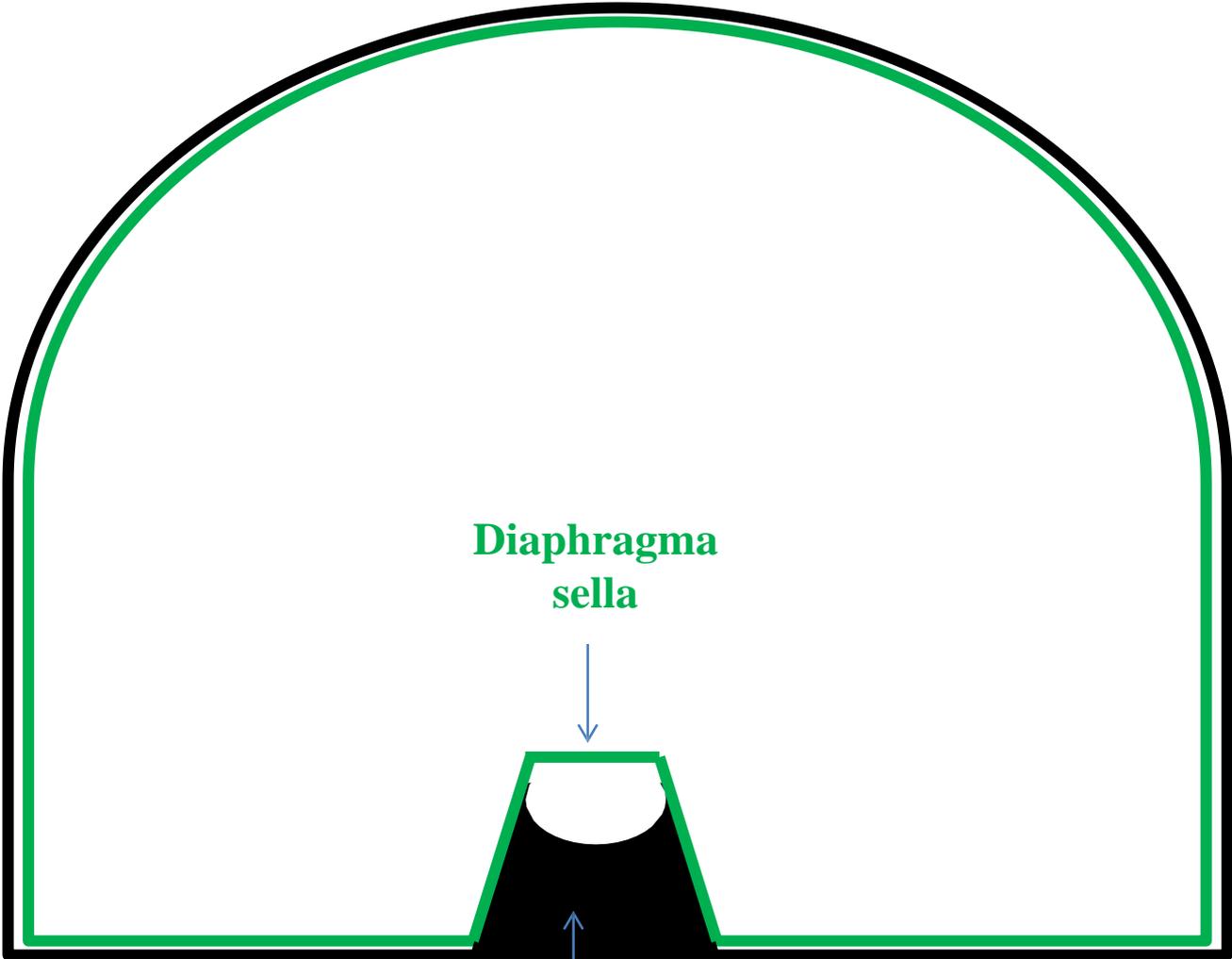
It looks like a room : it has anterior wall,posterior wall ,medial wall (pituitary) , lateral wall (temporal lobe) , roof and floor

Extend from apex of the orbit to the apex of petrous bone

Cavernous sinuses lie on the lateral side of the body of the sphenoid bone



Coronal section

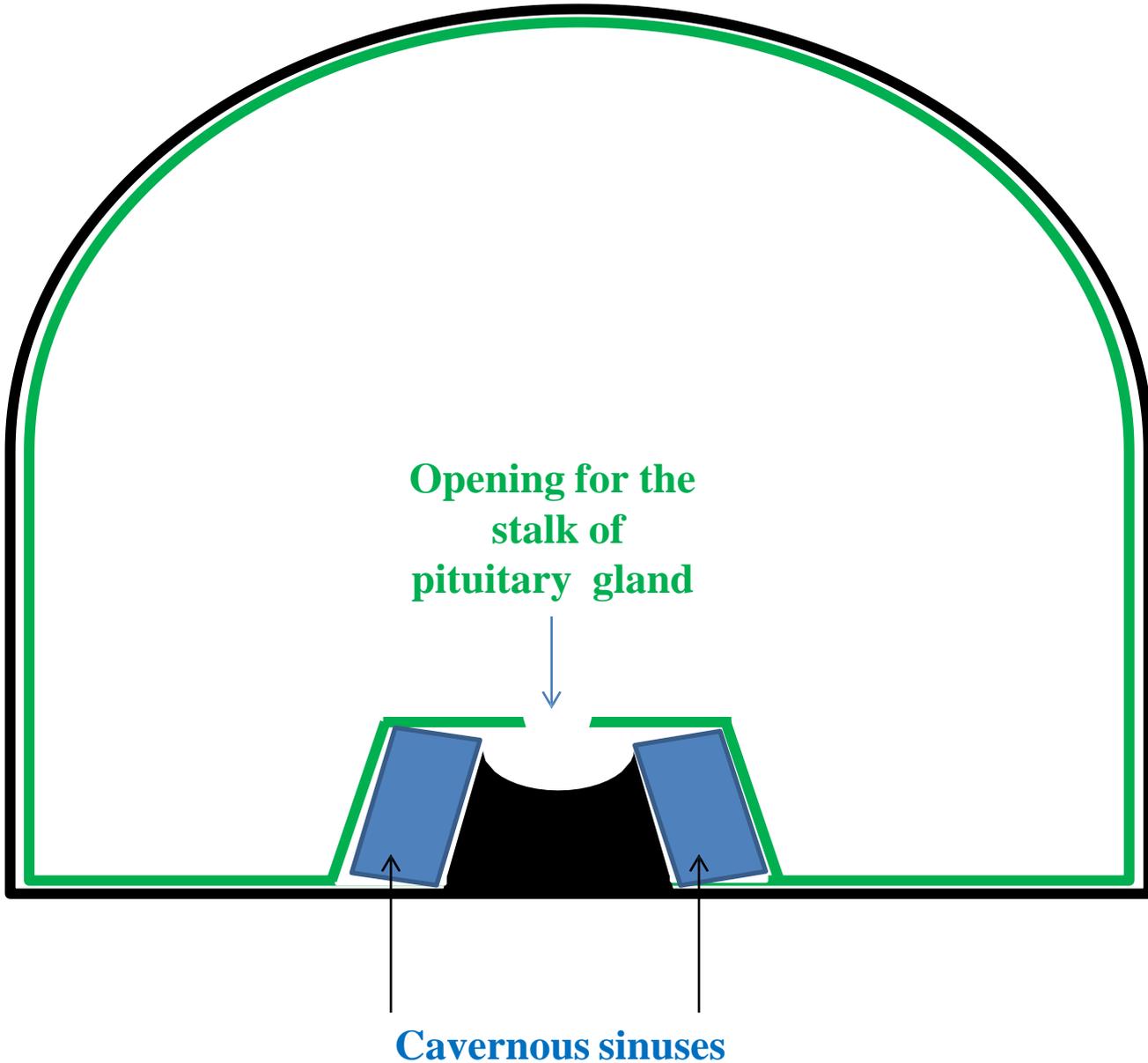


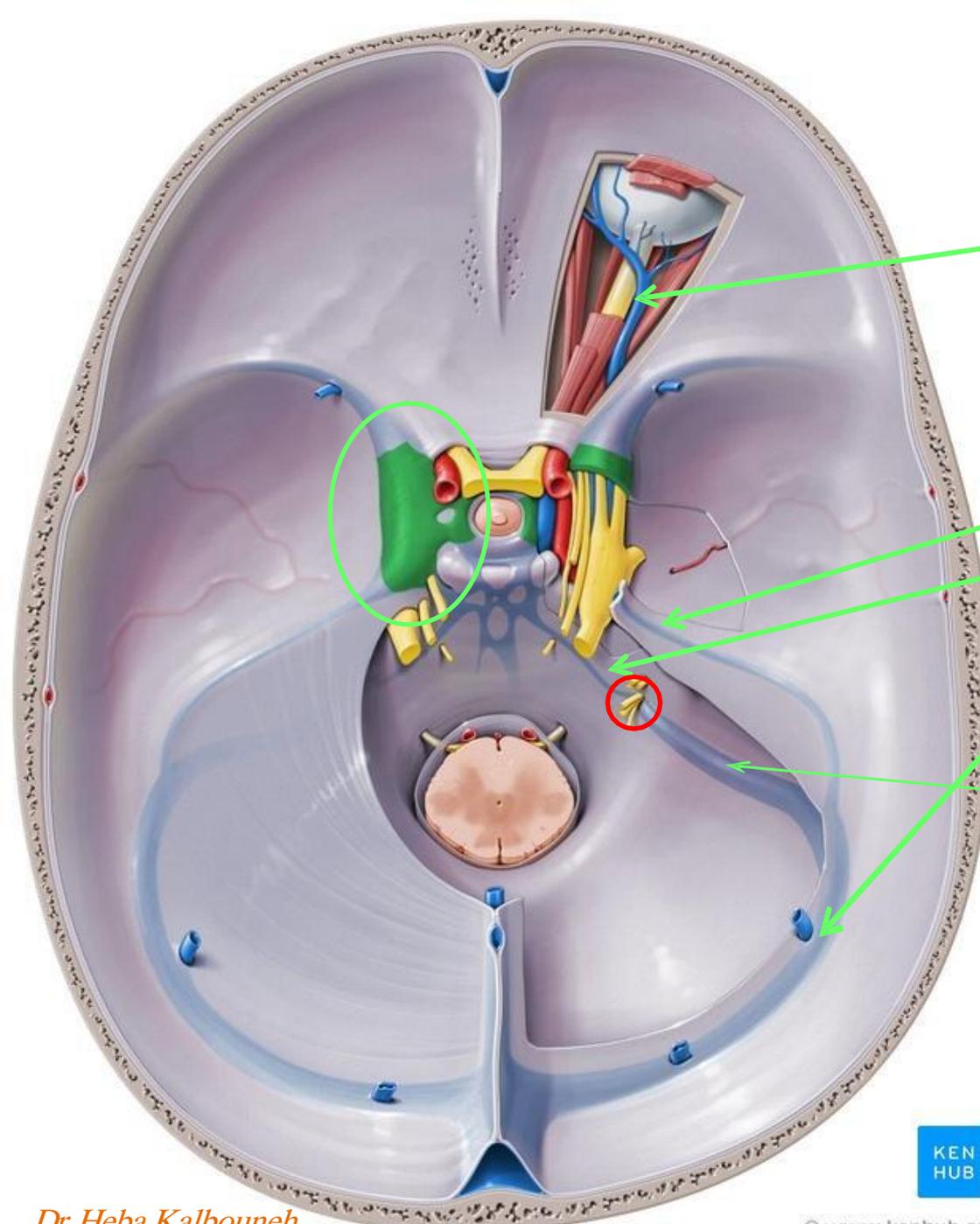
**Meningeal
layer of
dura mater**

**Diaphragma
sella**

Body of sphenoid with sella turcica

When the meningeal layer separates from the periosteal layer this creates spaces and these spaces are filled with venous blood forming cavernous sinuses





Anteriorly, the sinus receives

- 1-Ophthalmic veins**
- 2-Central vein of retina**

The sinus drains posteriorly into:

- Superior petrosal sinus**
- Inferior petrosal sinus**

then

- Superior petrosal sinus**
- and

Transverse sinus drain into
sigmoid sinus

Inferior petrosal sinus passes through
jugular foramen to drain directly
into **Internal jugular vein**



Intercavernous sinuses

CONNECTIONS OF CAVERNOUS SINUS

These two connections are an important route for the spread of infection from the face

Superior and inferior-**Ophthalmic veins** connect cavernous sinus with the facial vein

Emissary veins -2 connect cavernous sinus with pterygoid plexus of veins in the infratemporal fossa

Facial vein

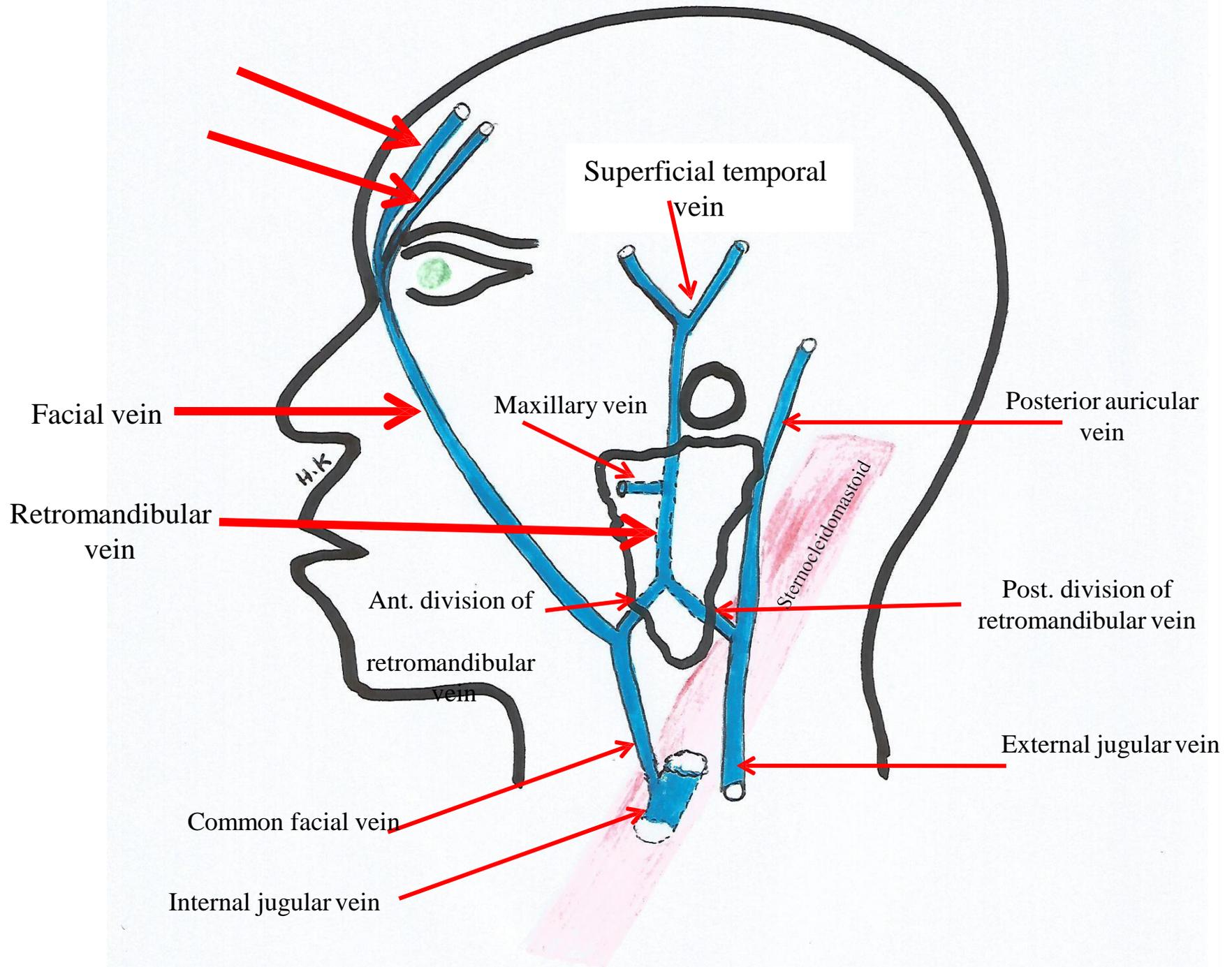
deep facial vein

Emissary vein

Infratemporal fossa

Pterygoid plexus

These veins are valvless , if there is an infection in the face , it will be transmitted to cavernous sinus



What are the structures within the parotid gland

????????

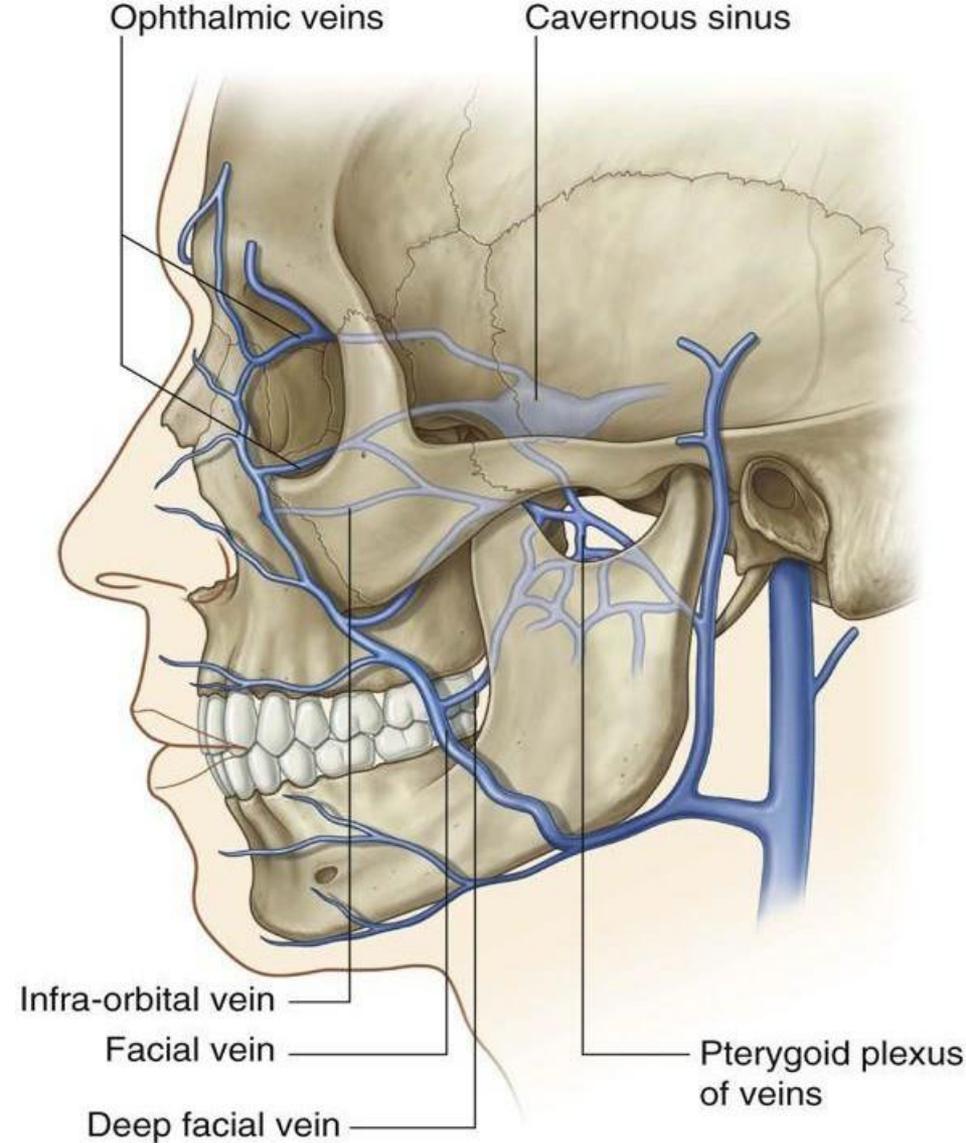
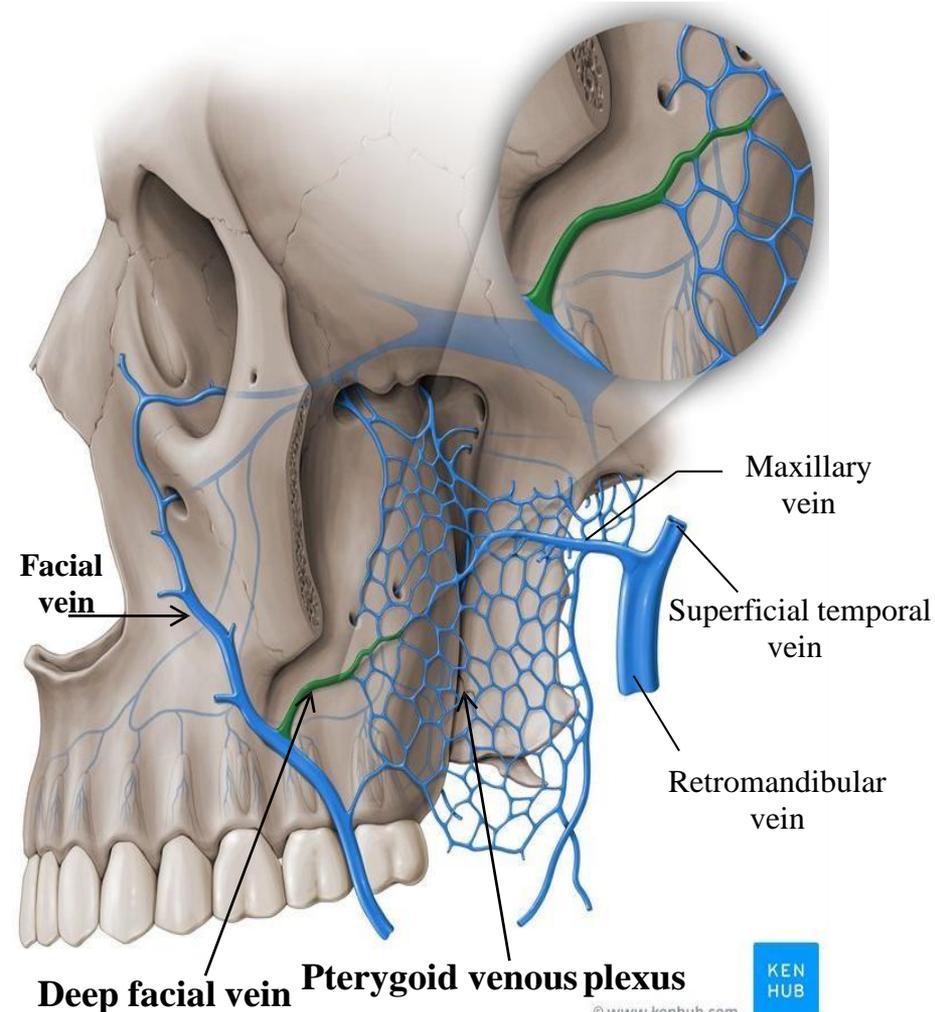
1) facial nerve and its five terminal motor branches

**2) External carotid artery with its two terminal
branches**

3) Retromanibular vein with its two tributaries

Pterygoid venous plexus forms the maxillary vein

Maxillary vein unites with superficial temporal vein to form retromandibular vein within the parotid gland



The deep facial vein connects the facial vein with the pterygoid venous plexus