

Neurocranium

Ivana Hradilová Svíženská

Neurocranium (8)

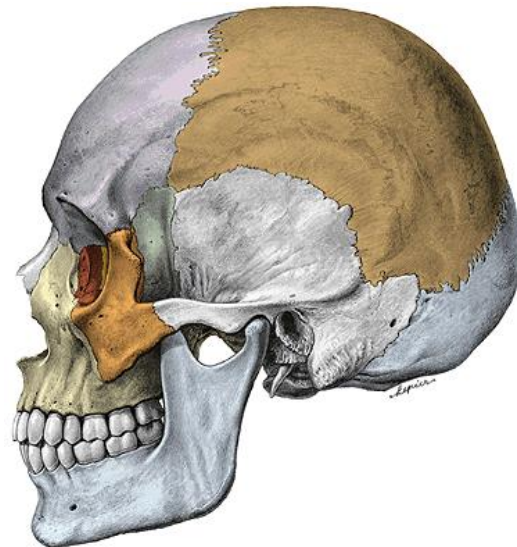
protection of the brain and the sense organ

Skull (22)

x

Viscerocranium (14)

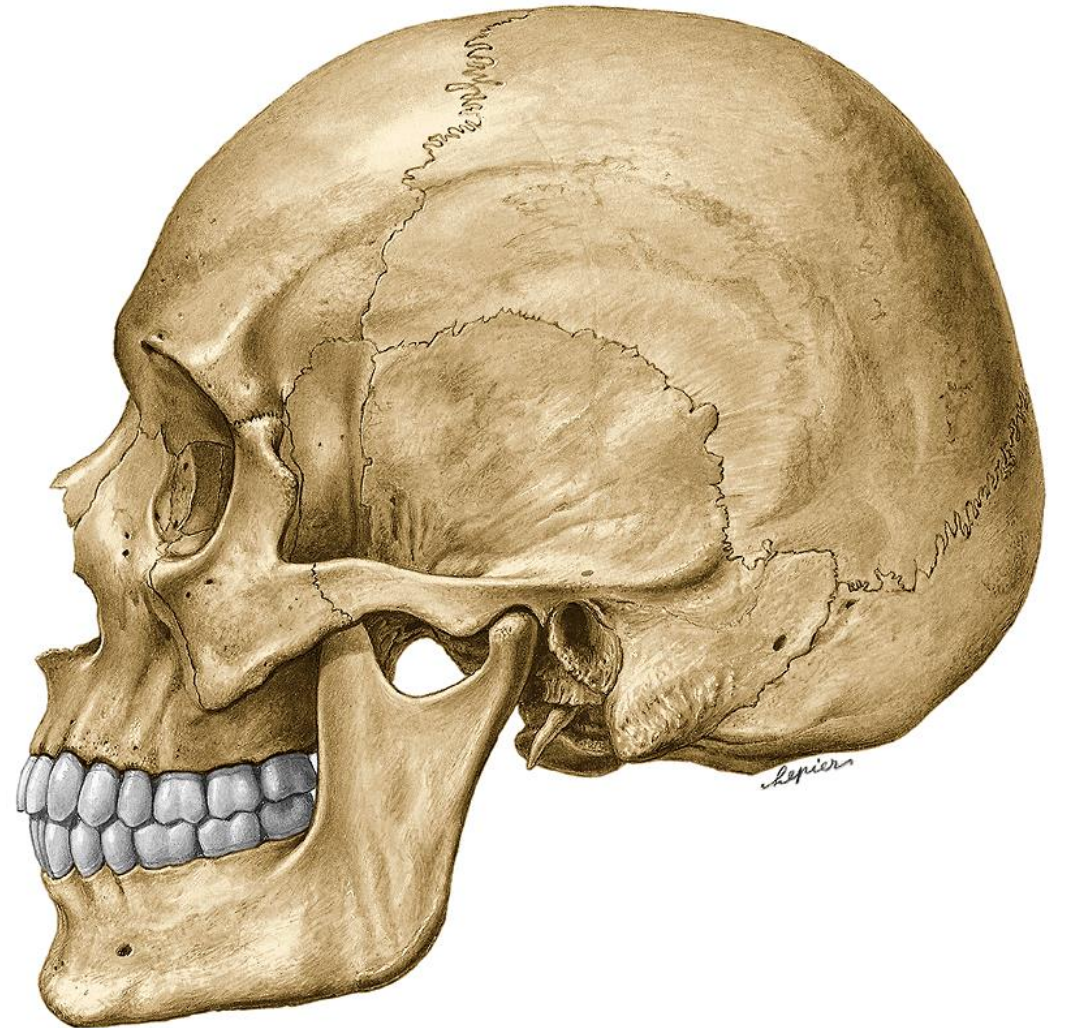
contains the initial portions of the gastrointestinal and respiratory tracts



Neurocranium: base + vault (calvarium)

Base: chondrocranium

Vault: desmocranium



Neurocranium:

Unpaired:

os frontale

os ethmoidale

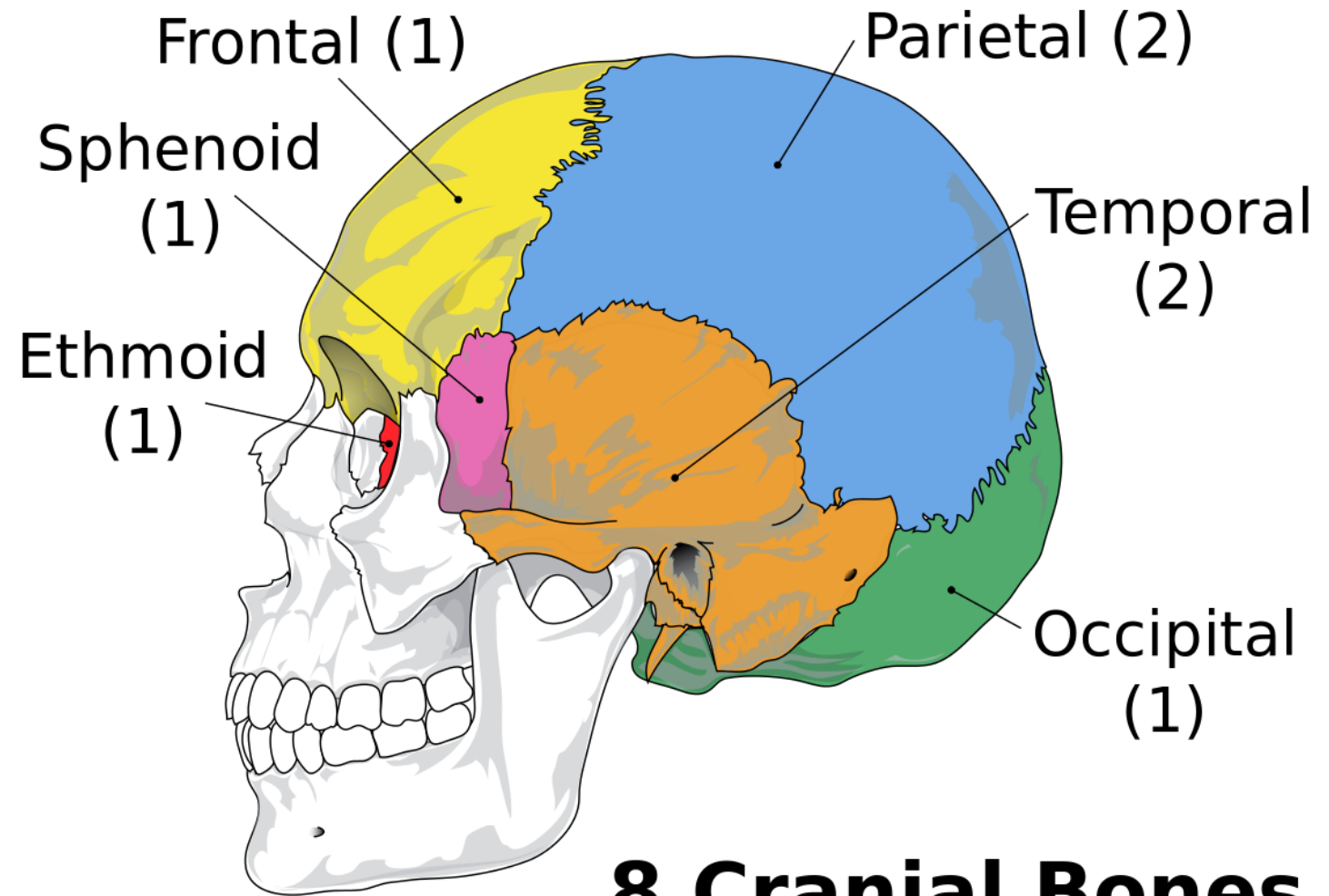
os sphenoidale

os occipitale

Paired:

os parietale

os temporale



Neurocranium:

Unpaired:

os frontale

os ethmoidale

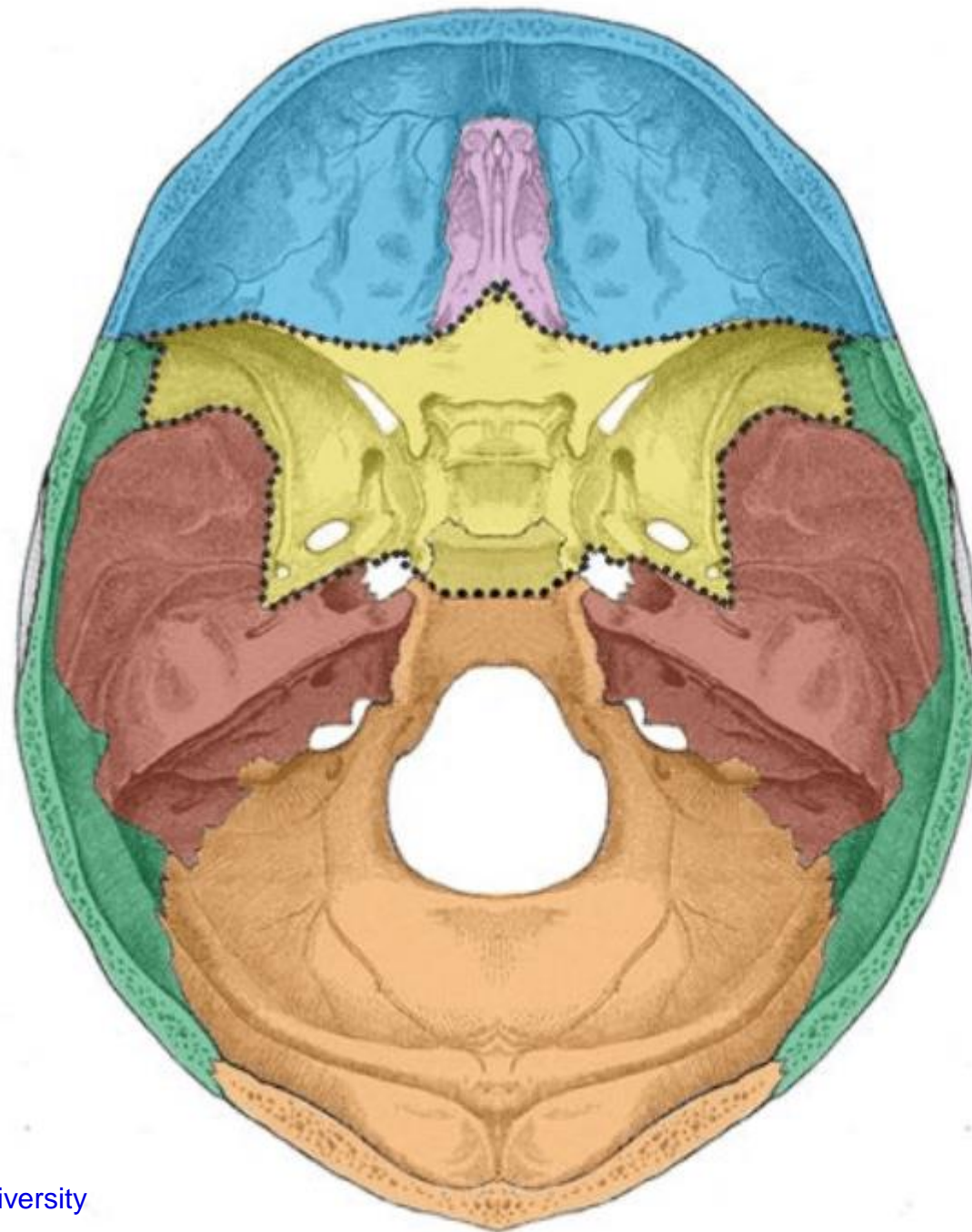
os sphenoidale

os occipitale

Paired:

os parietale

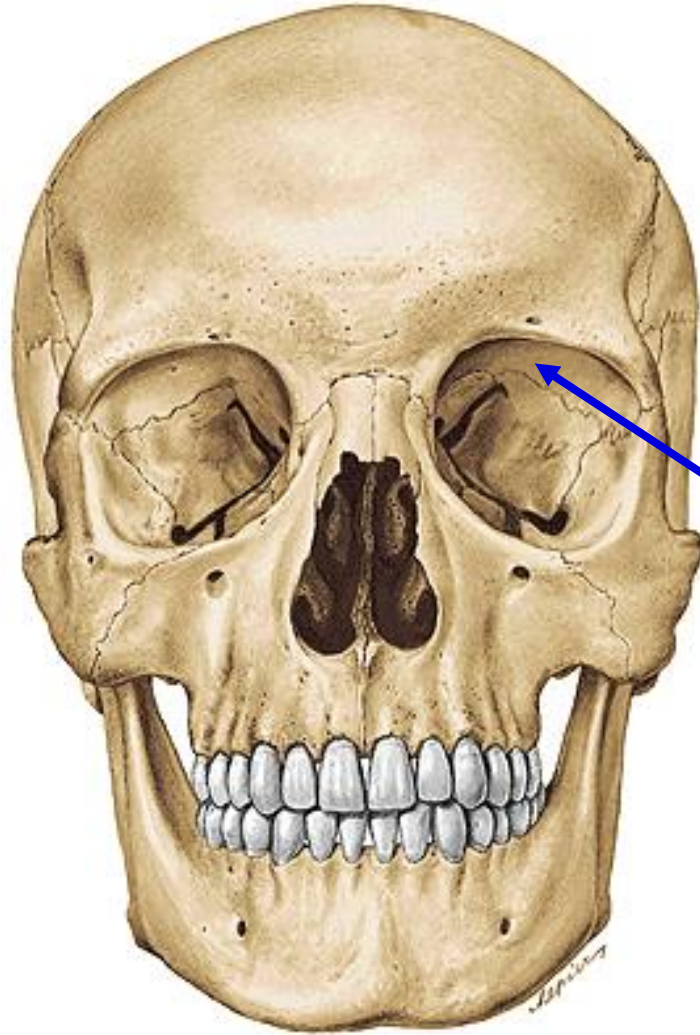
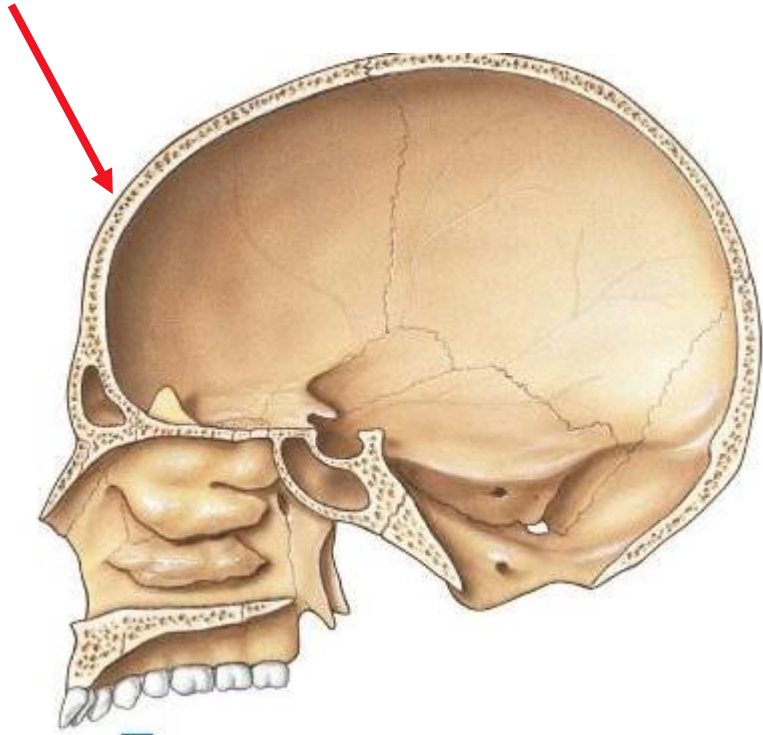
os temporale



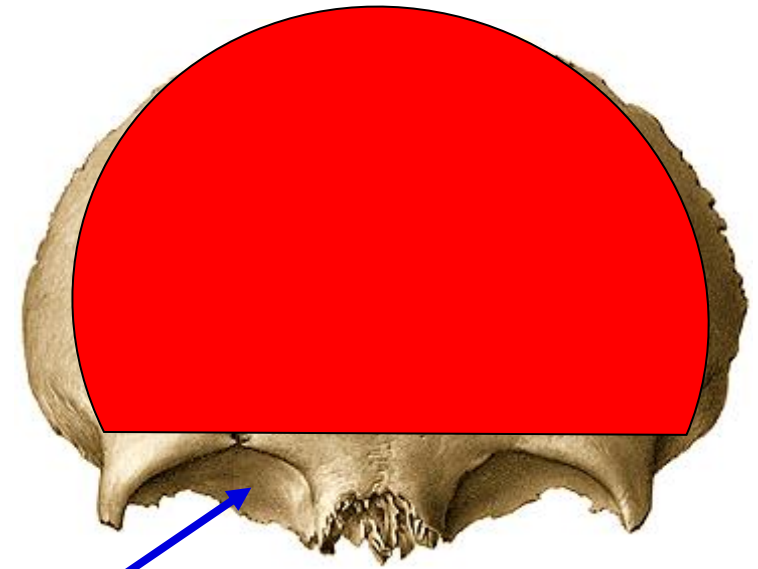
- Frontal
- Ethmoid
- Sphenoid
- Temporal
- Parietal
- Occipital
- Zygomatic

Squama frontalis
Pars orbitalis
Pars nasalis

Os frontale

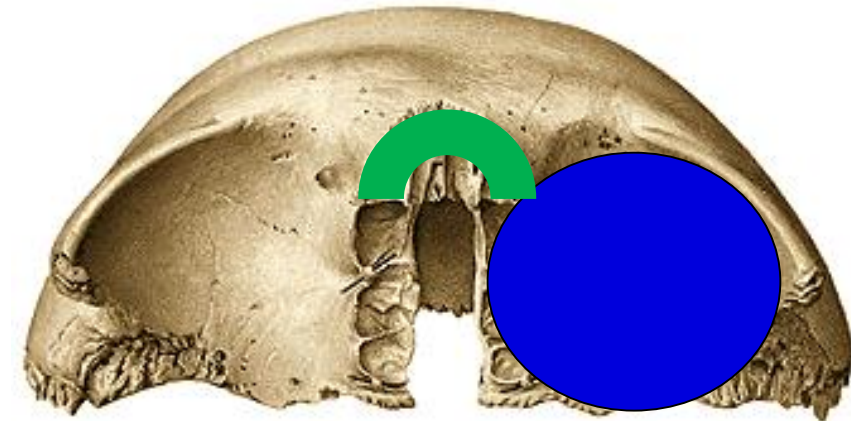


(anterior view)



(inferior view)

A



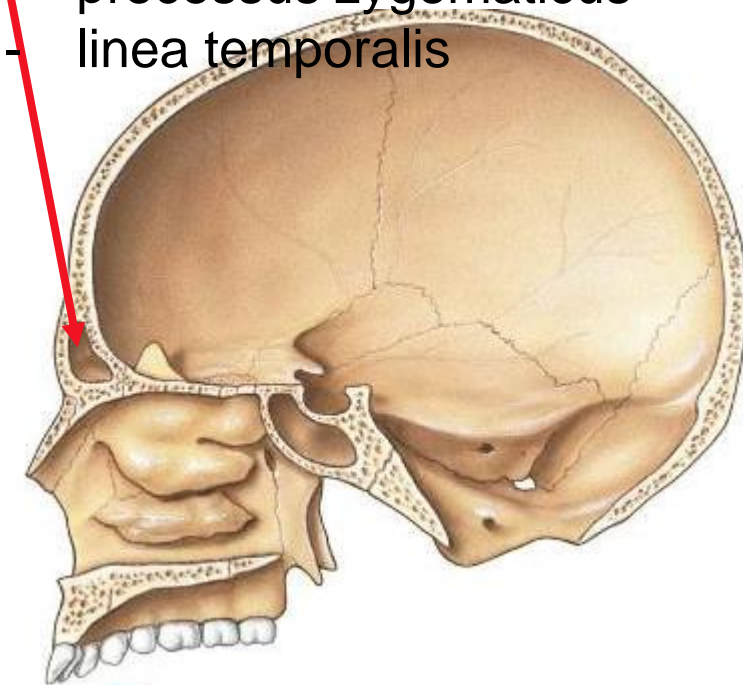
P

M E D

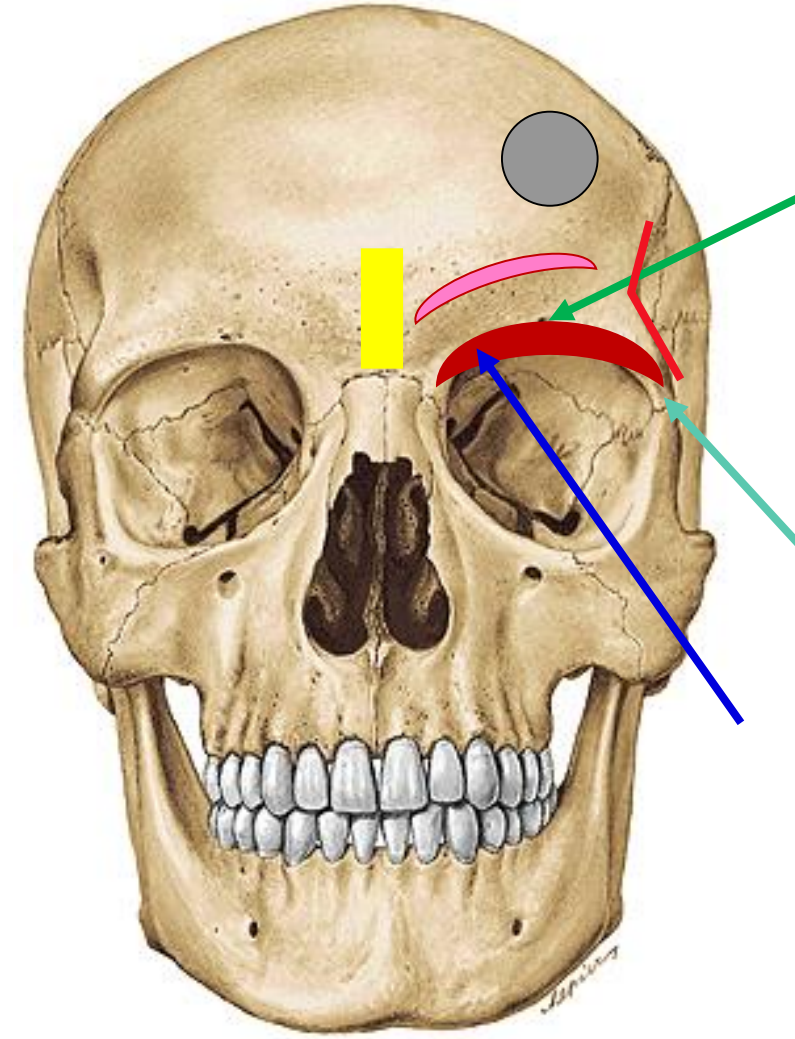
Squama – facies externa:

externa:

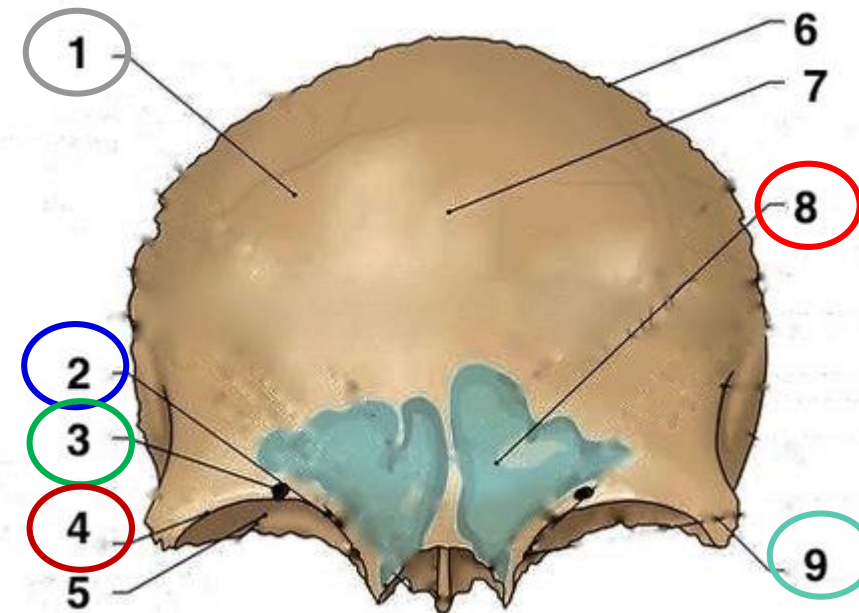
- sinus frontalis – septum sinuum frontaliū
- margo supraorbitalis
- incisura frontalis
- foramen supraorbitale
- arcus superciliaris
- glabella
- tuber frontale
- processus zygomaticus
- linea temporalis



Os frontale

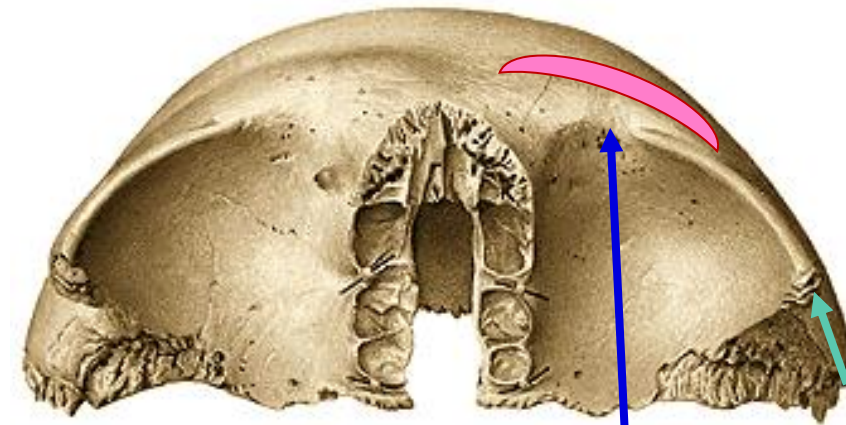


(anterior view)



(inferior view)

A



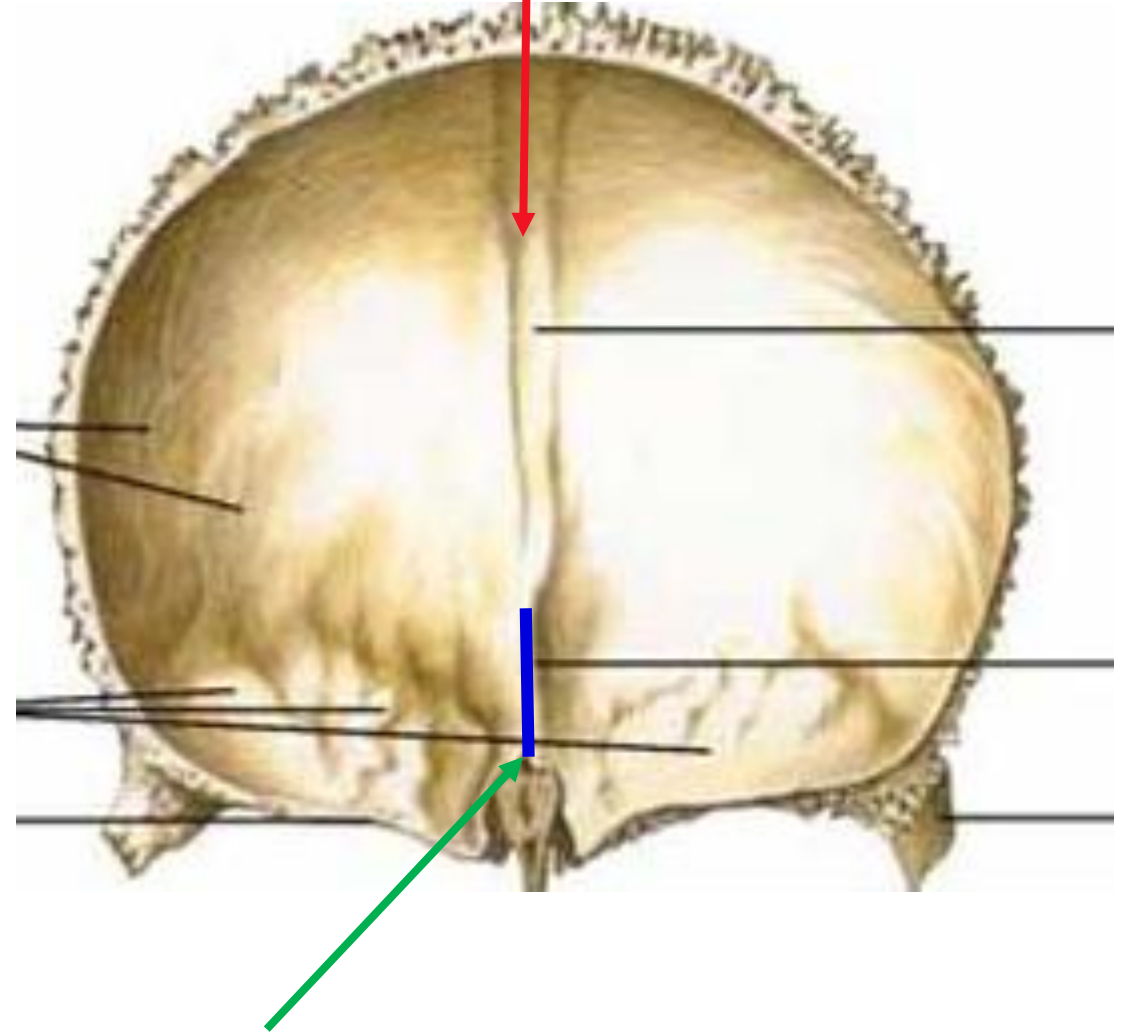
P

M E D

Os frontale

Squama – facies interna:

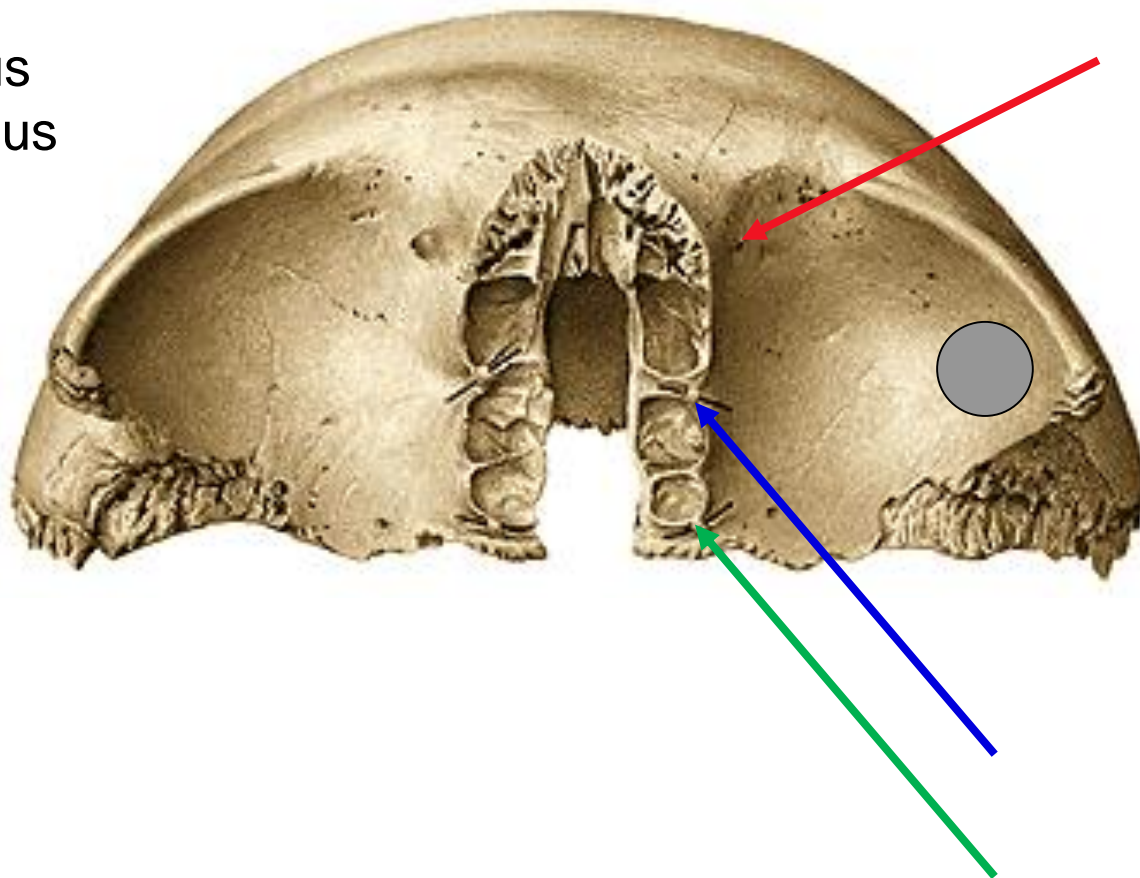
- impressiones gyrorum
- juga cerebralia
- sulci arteriosi
- sulcus sinus sagittalis superioris
- crista frontalis
- foramen cecum
- margo parietalis



Os frontale

Pars orbitalis – facies orbitalis:

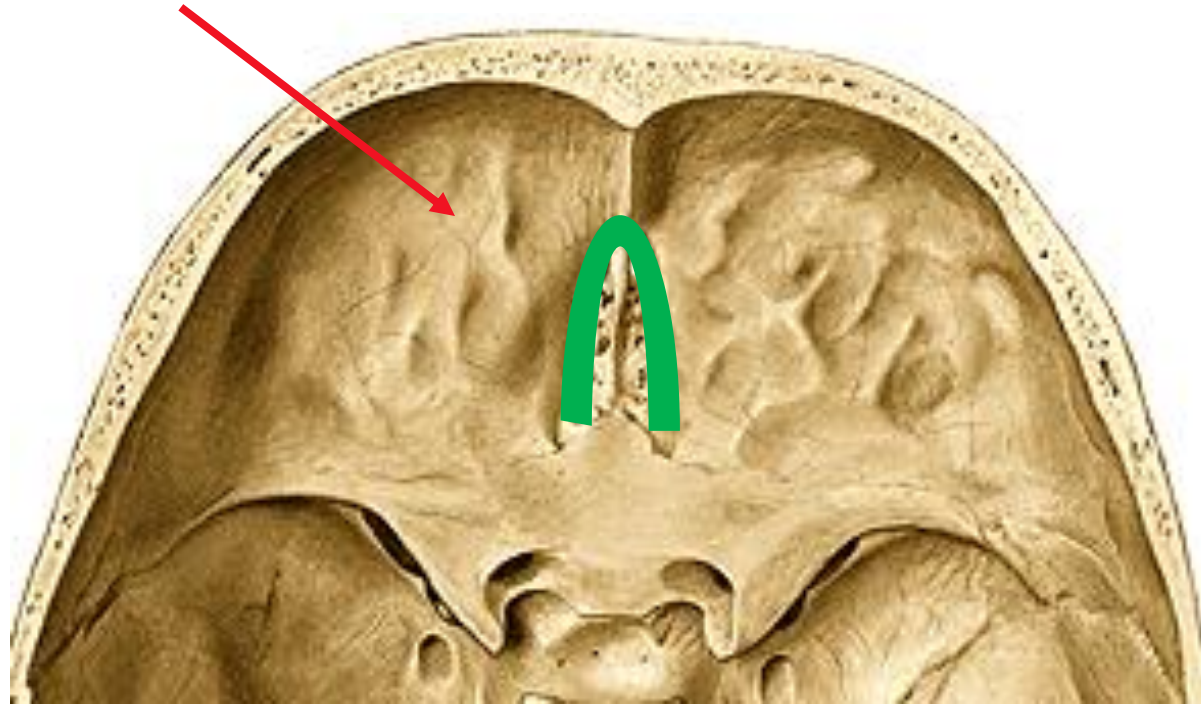
- fovea (spina) trochlearis
- fossa glanulae lacrimalis
- foramen ethmoidale anterius
- foramen ethmoidale posterius



Pars orbitalis – facies cerebralis:

- impressioes gyrorum
- juga cerebralia
- sulci arteriosi
- incisura ethmoidalis

Os frontale



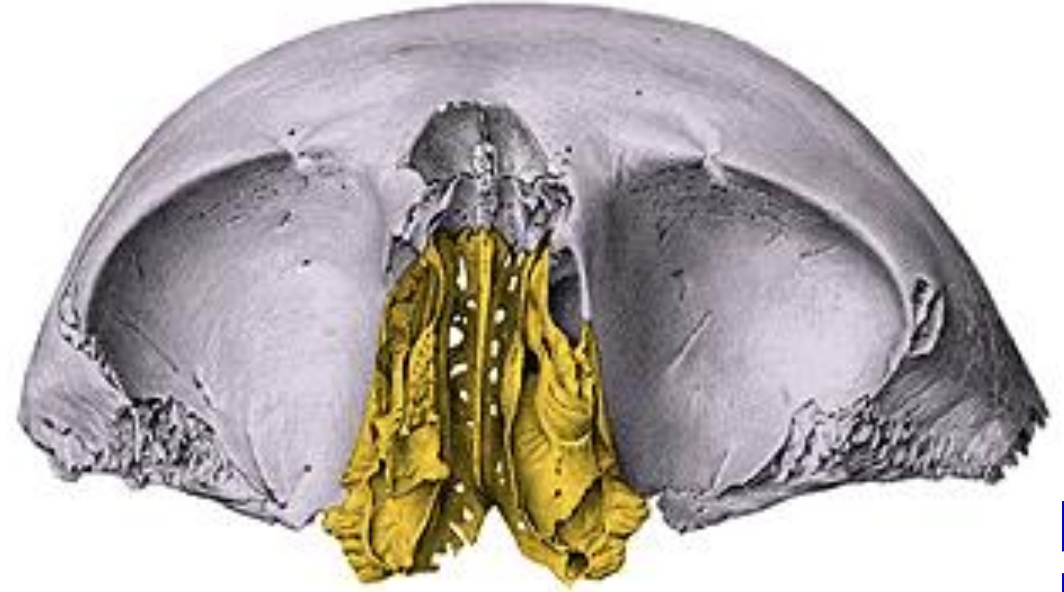
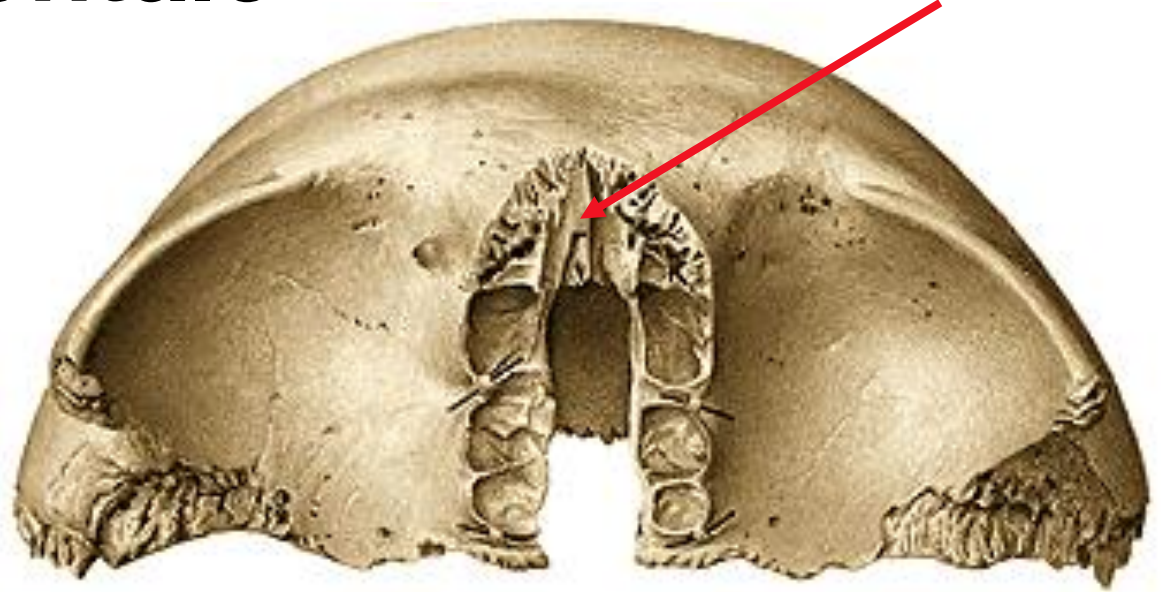
Pars nasalis:

- spina nasalis
- apertura sinus frontalis

Os frontale

(inferior view)

(anterior view)

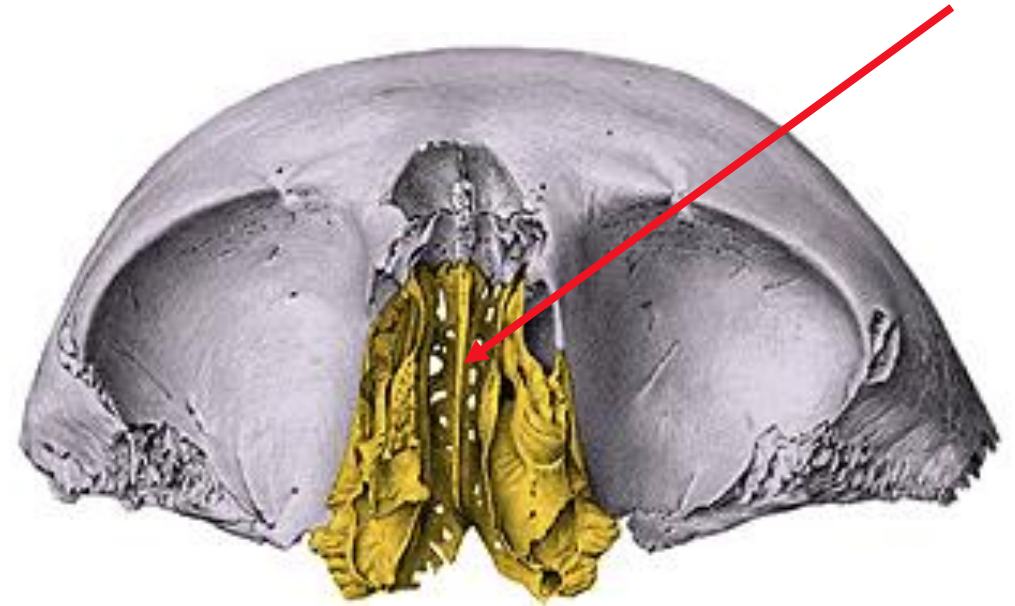
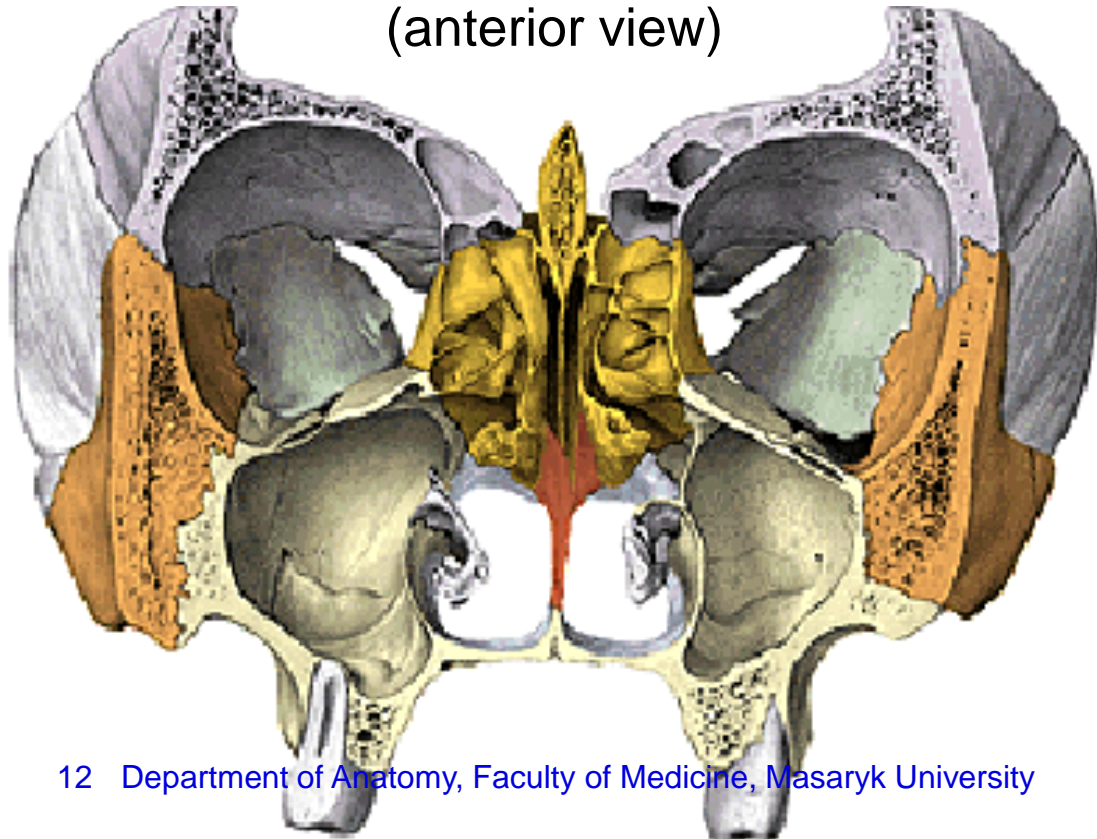


Labyrinthus ethmoidalis **Os ethmoidale** (inferior view)

Lamina cribrosa

Lamina perpendicularis

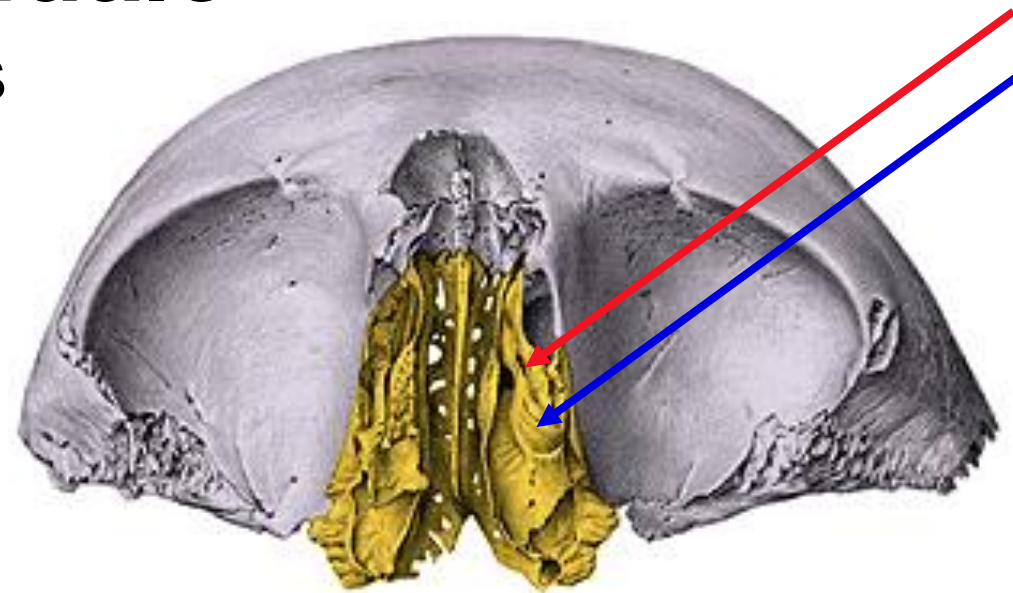
(anterior view)



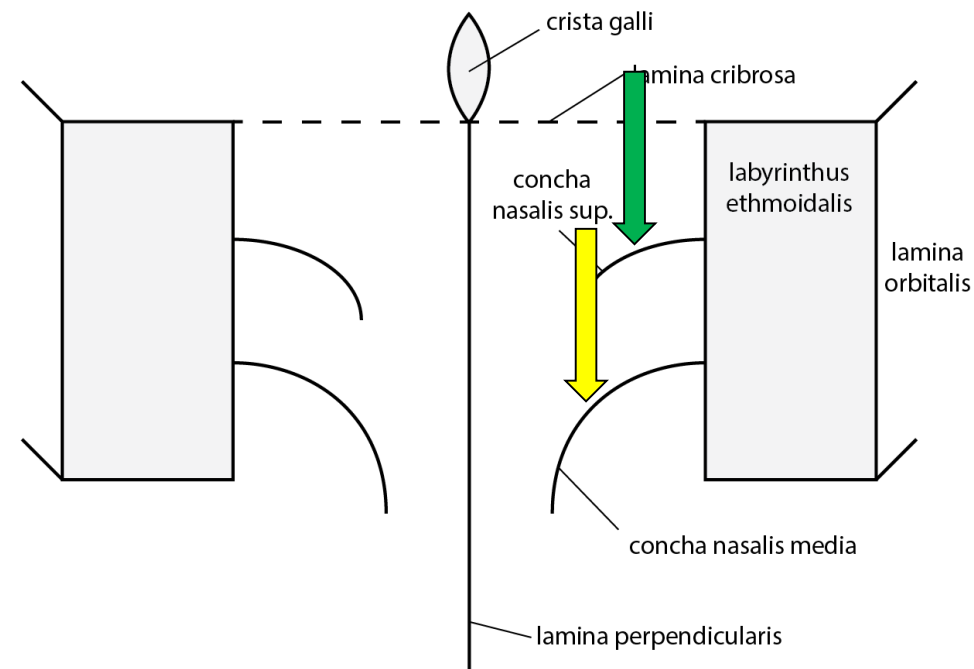
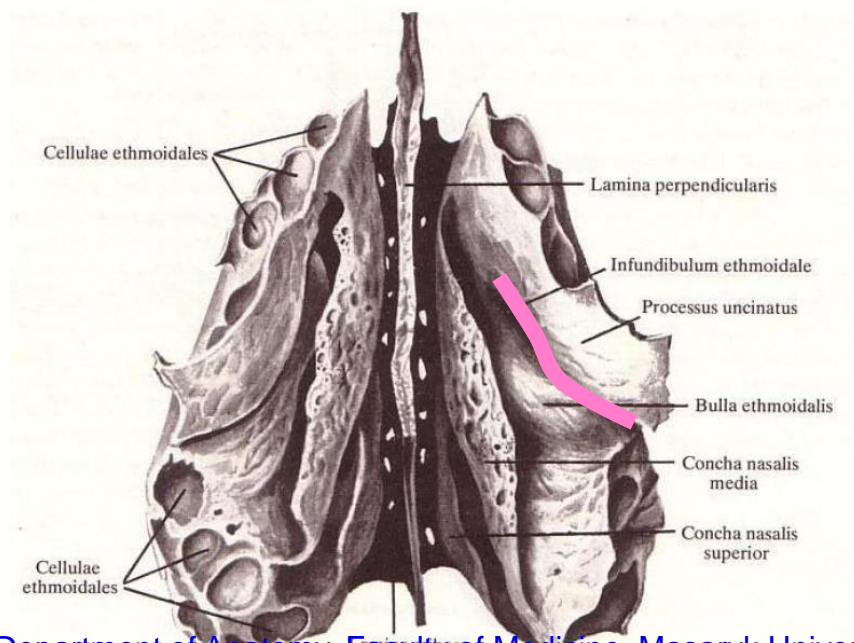
Os ethmoidale (inferior view)

Labyrinthus ethmoidalis

- concha nasalis superior
- concha nasalis media
- processus uncinatus
- bulla ethmoidalis
- hiatus semilunaris



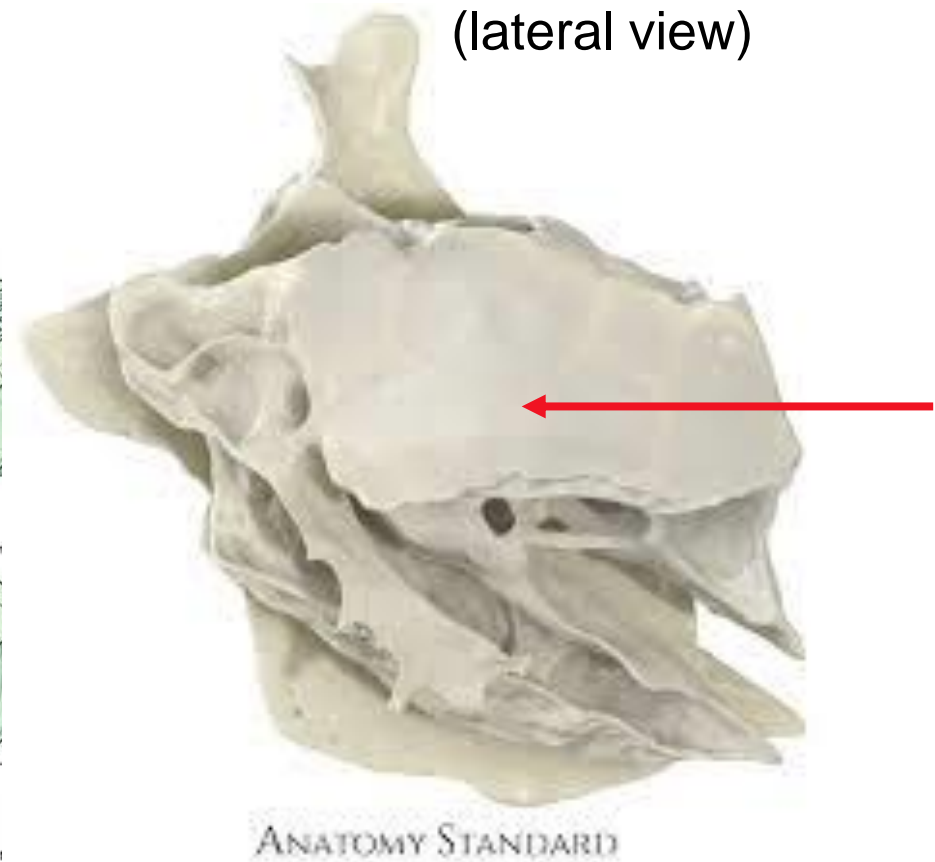
(inferior view)



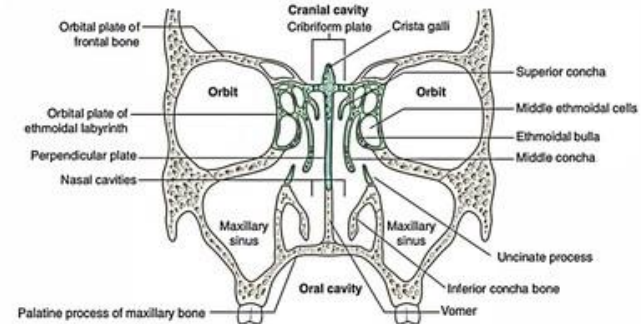
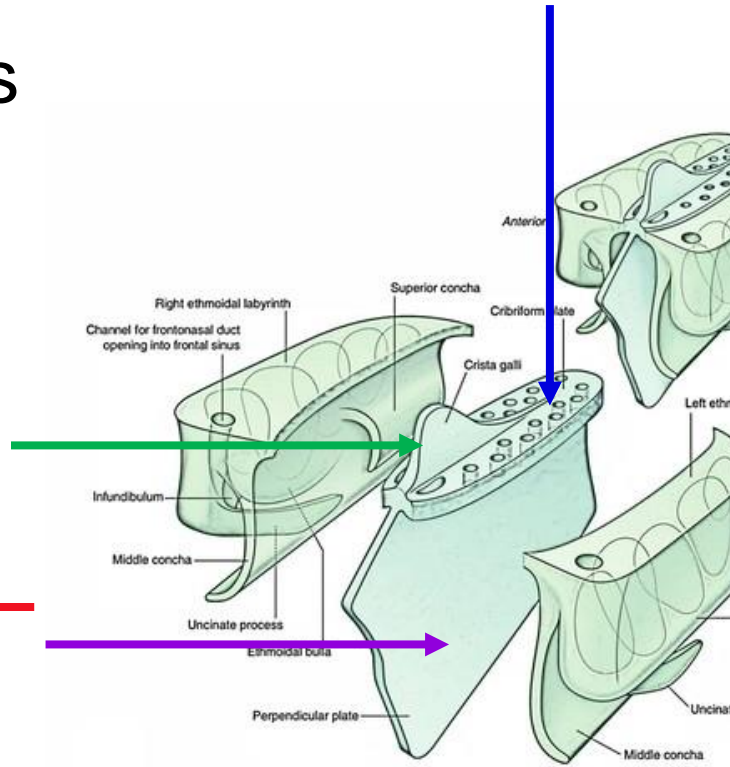
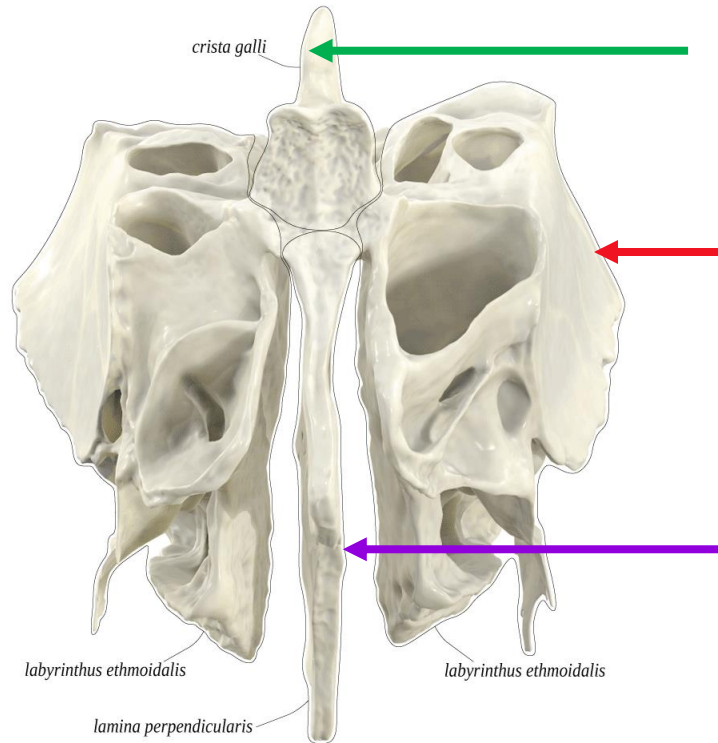
Os ethmoidale

- Lamina orbitalis
- Lamina cribrosa
- Lamina perpendicularis
- Crista galli

(lateral view)

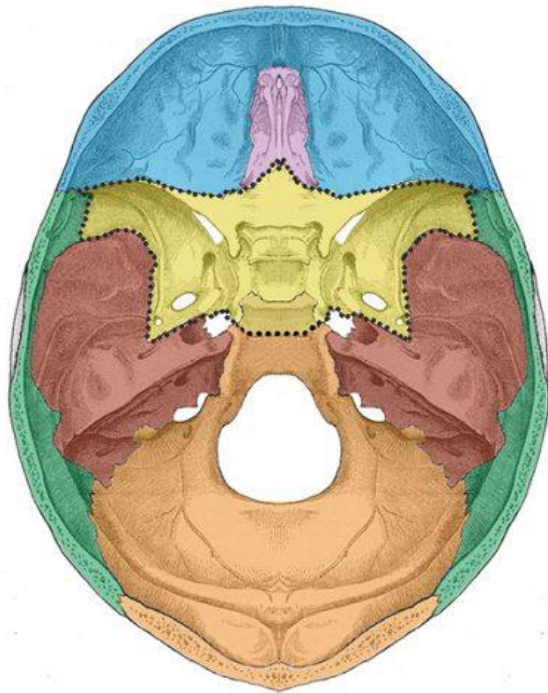
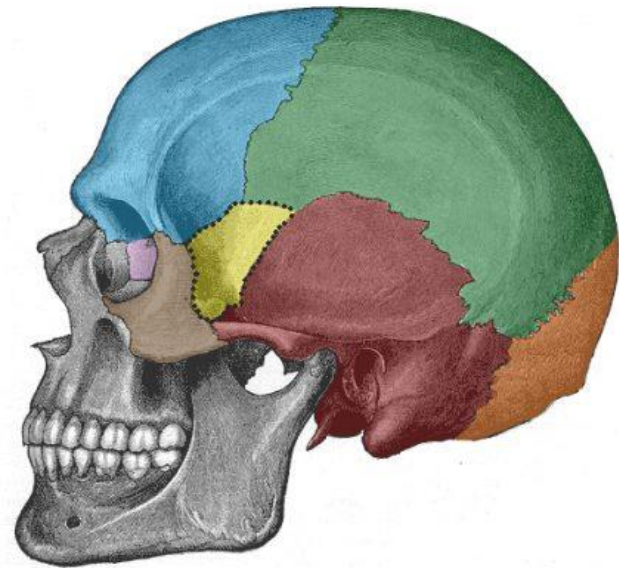


(anterior view)



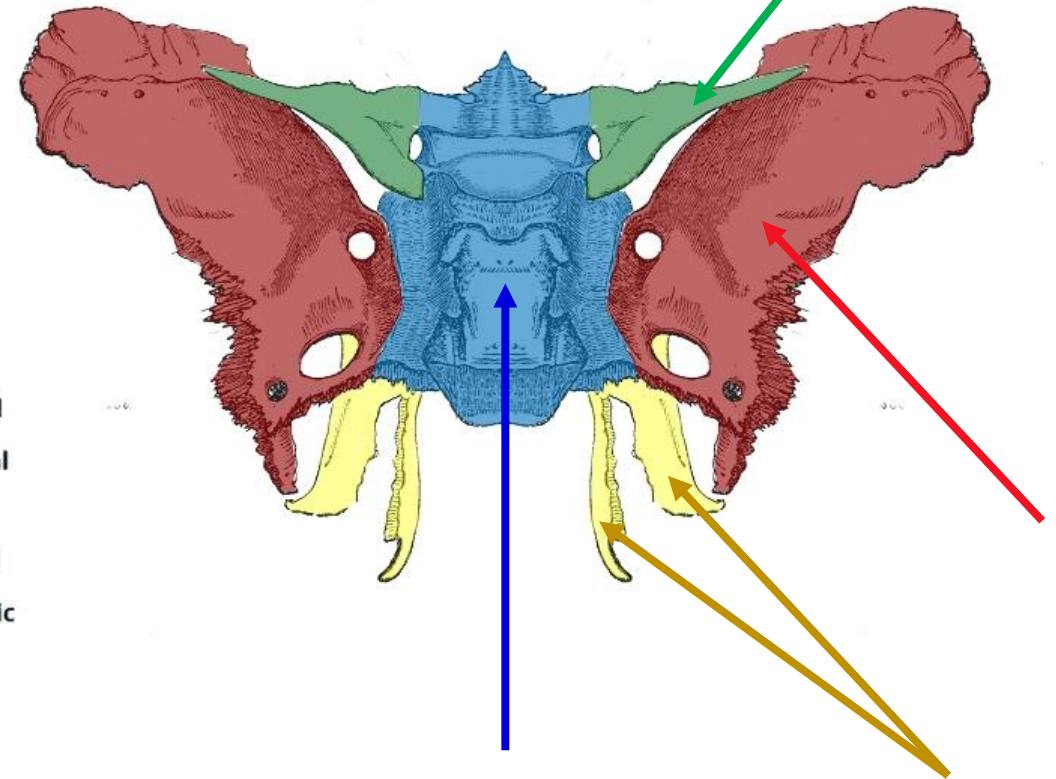
Corpus
 Ala major
 Ala minor
 Processus pterygoideus

Os sphenoidale



- Frontal
- Ethmoid
- Sphenoid
- Temporal
- Parietal
- Occipital
- Zygomatic

(posterior view)

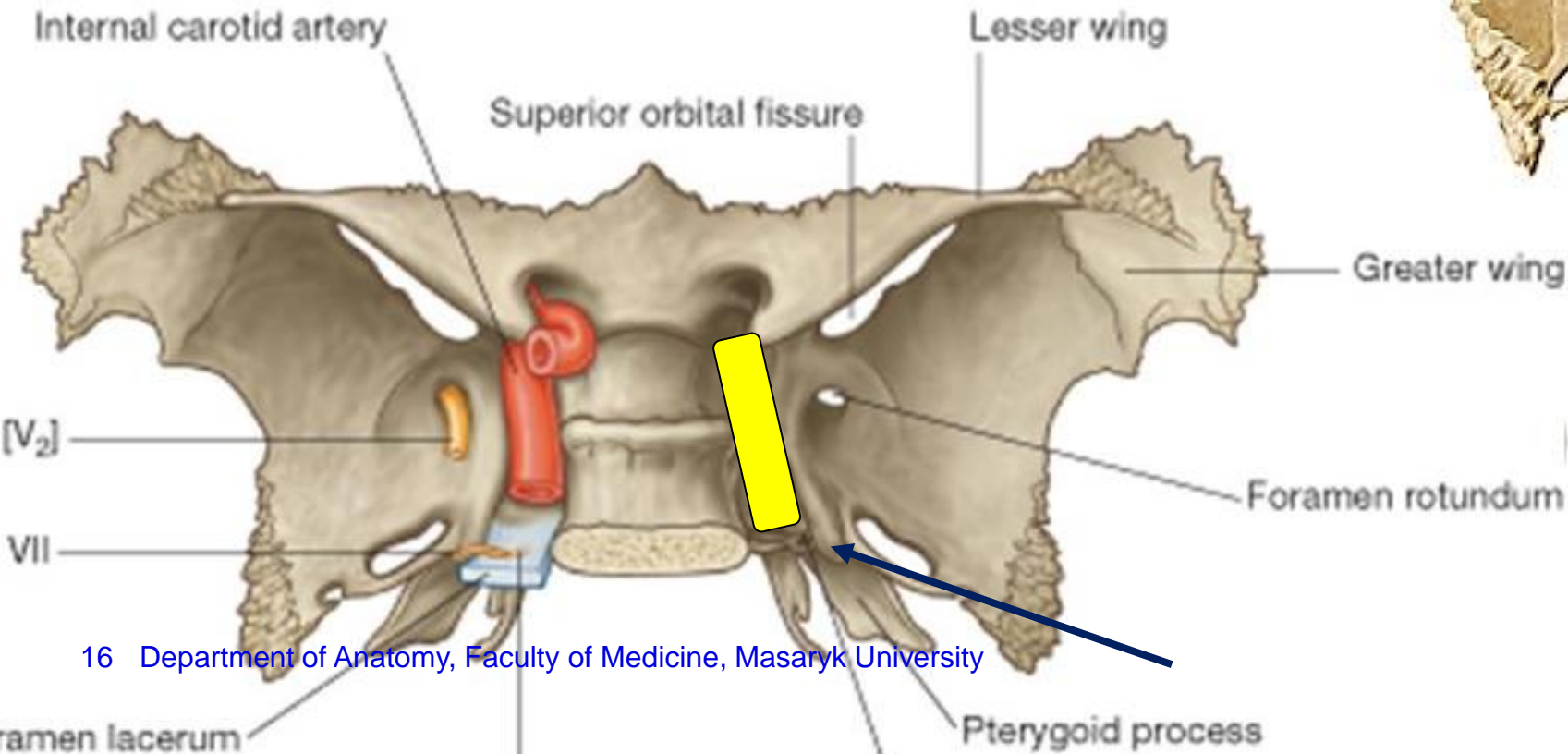
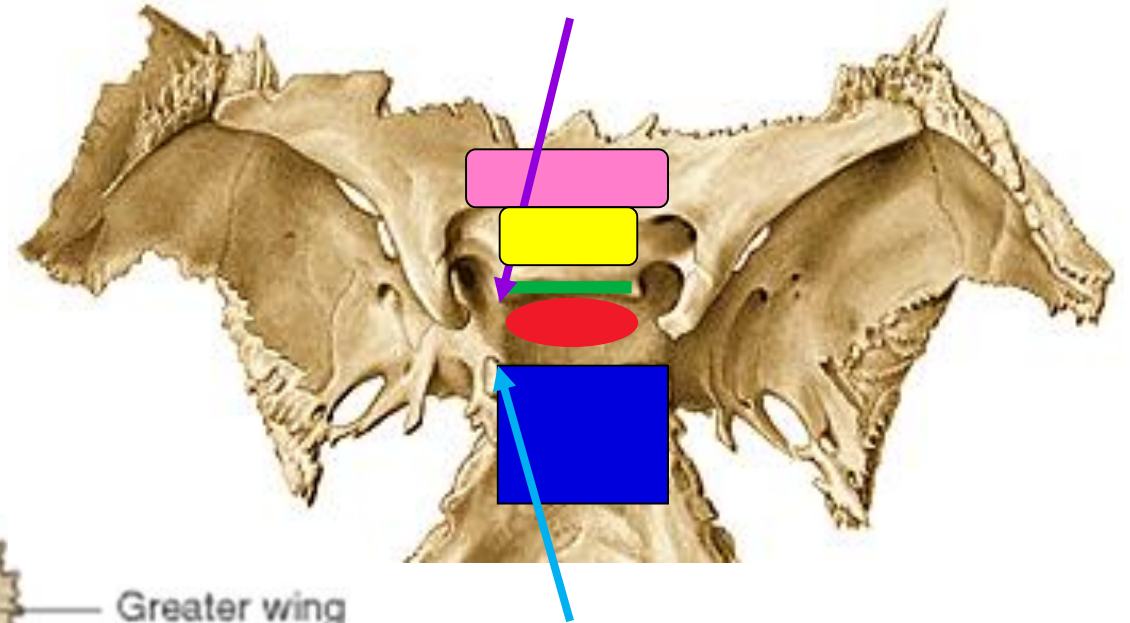


Corpus:

- sella turcica
 - fossa hypophysialis
 - dorsum sellae - processus clinoides posterior
 - tuberculum sellae - processus clinoides medius
- sulcus prechiasmaticus
- jugum sphenoidale
- sulcus caroticus – lingula sphenoidalis

Os sphenoidale

(superior view)

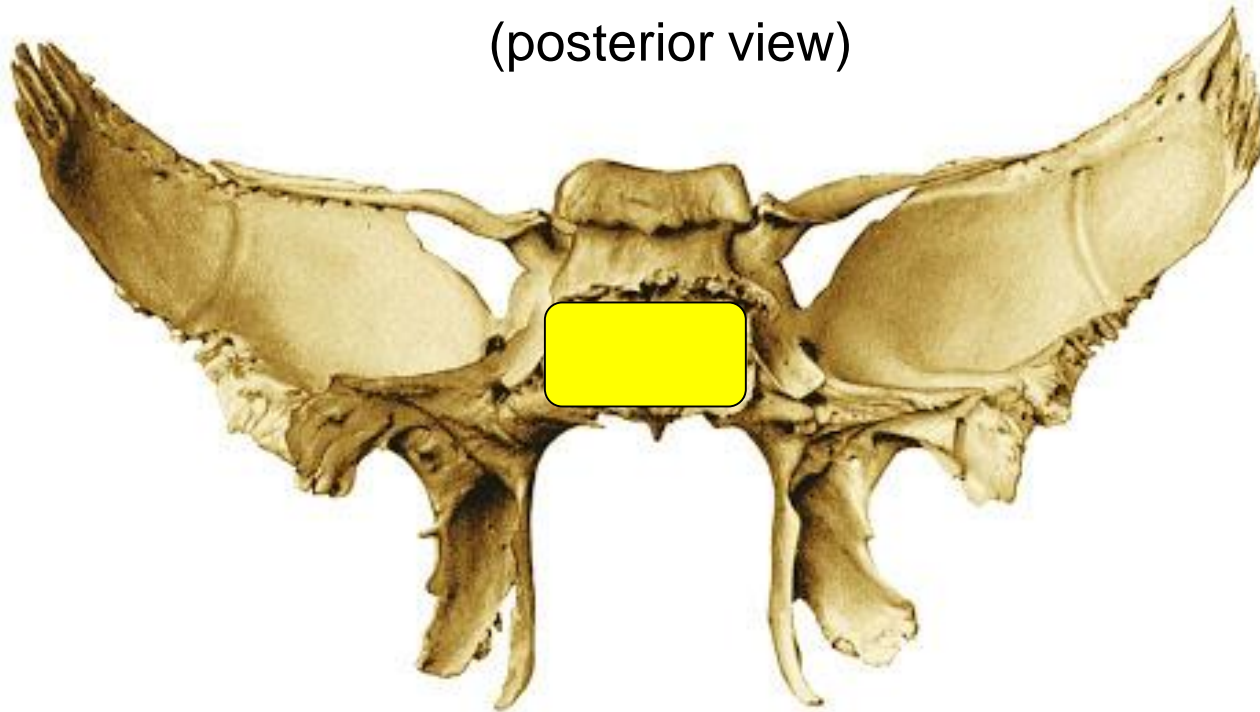


Corpus:

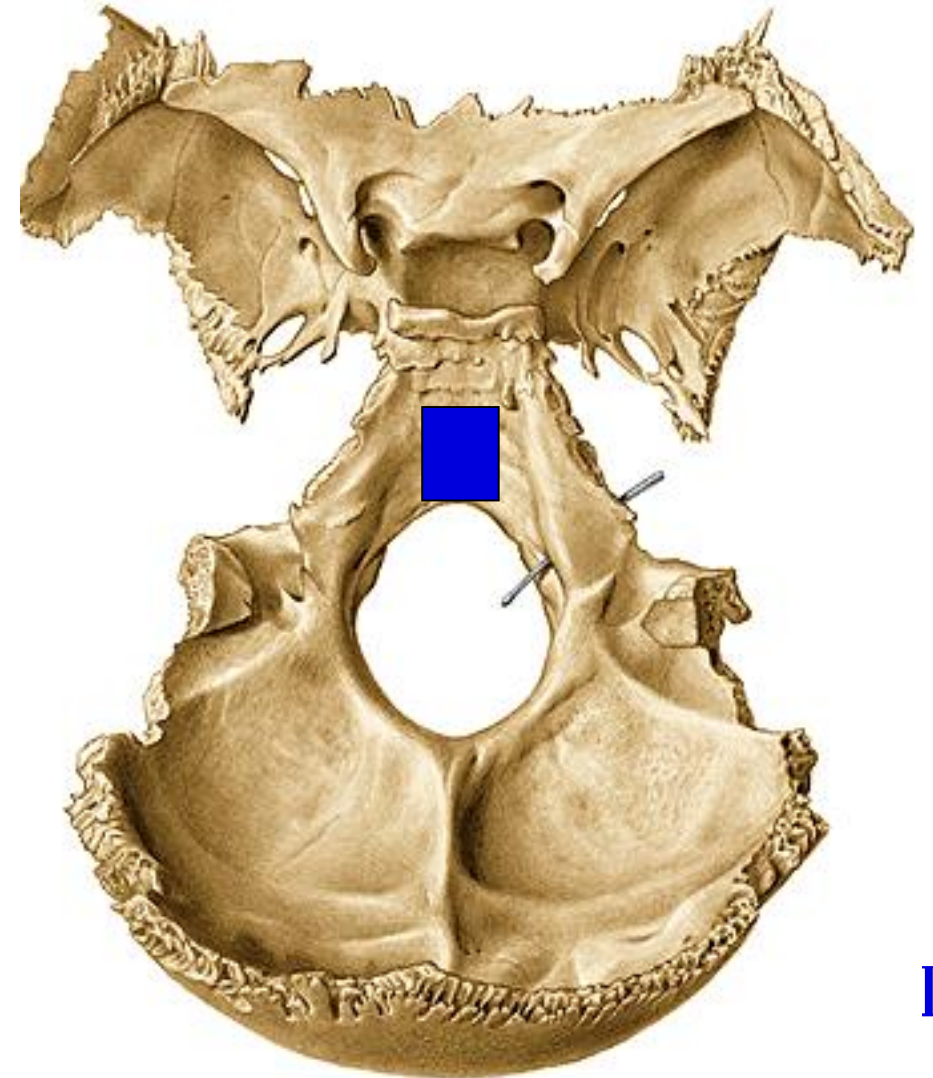
- synchondrosis sphenoccipitalis
- clivus

Os sphenoidale

(posterior view)



(superior view)

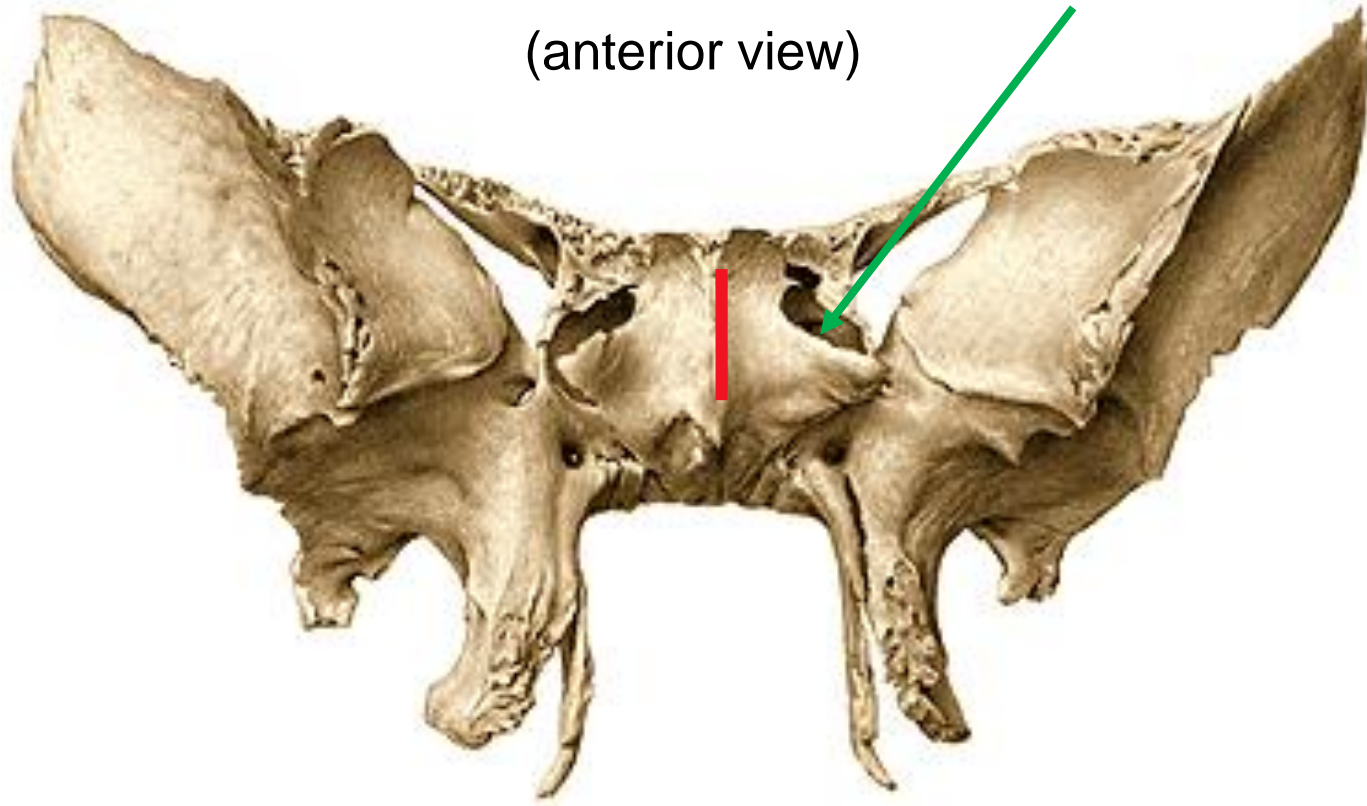


Corpus:

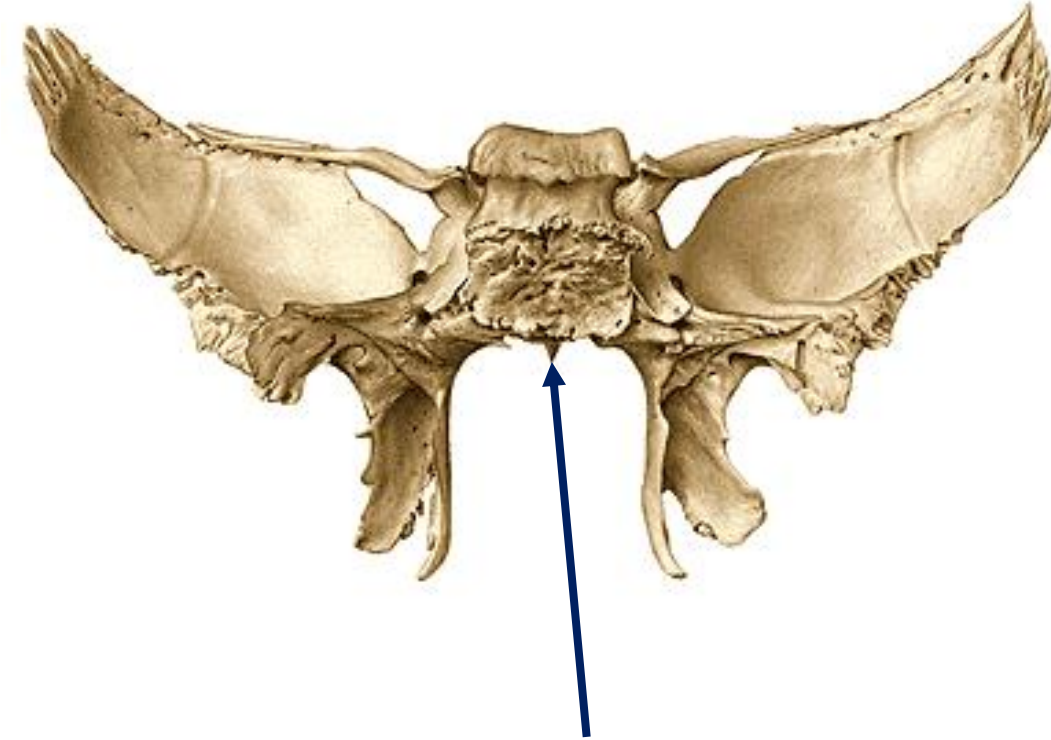
- crista sphenoidalis
- rostrum
- sinus sphenoidalis - septum sinuum sphenoidalium
- apertura sinus sphenoidalis

Os sphenoidale

(anterior view)



(posterior view)

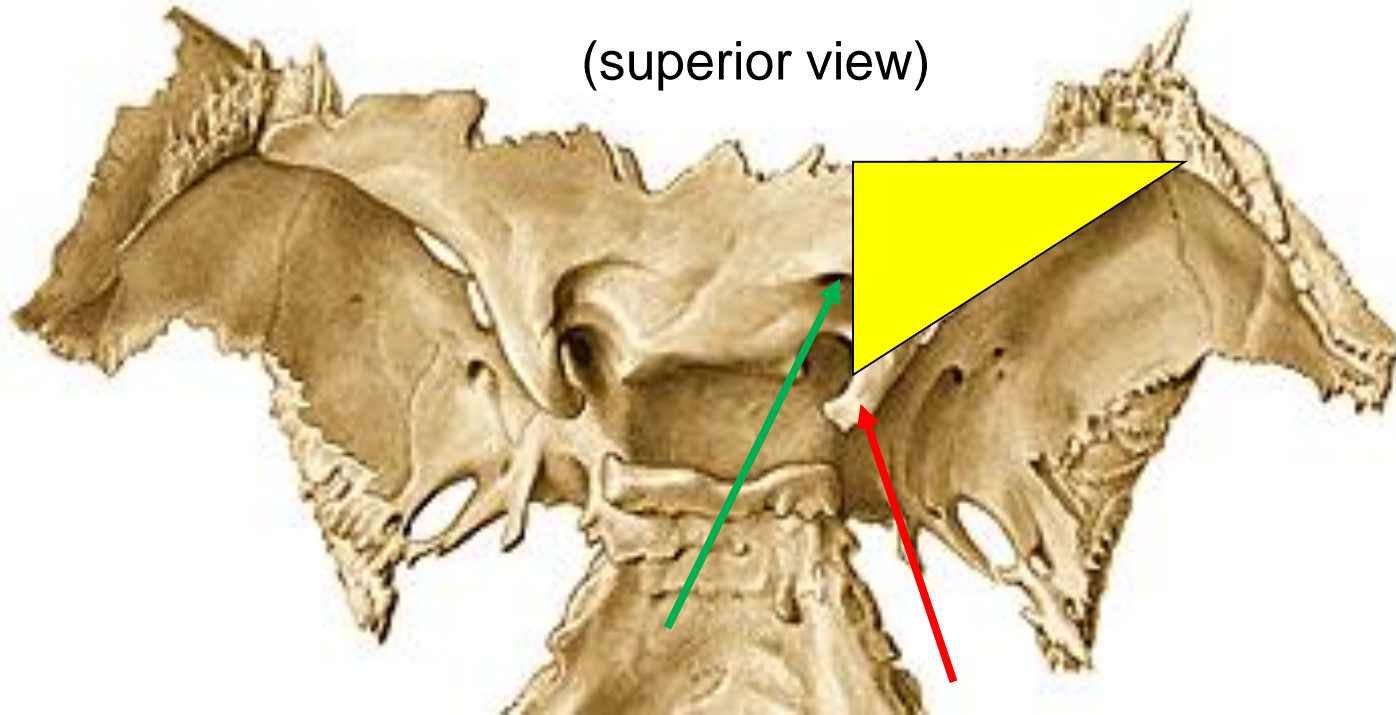


Ala minor:

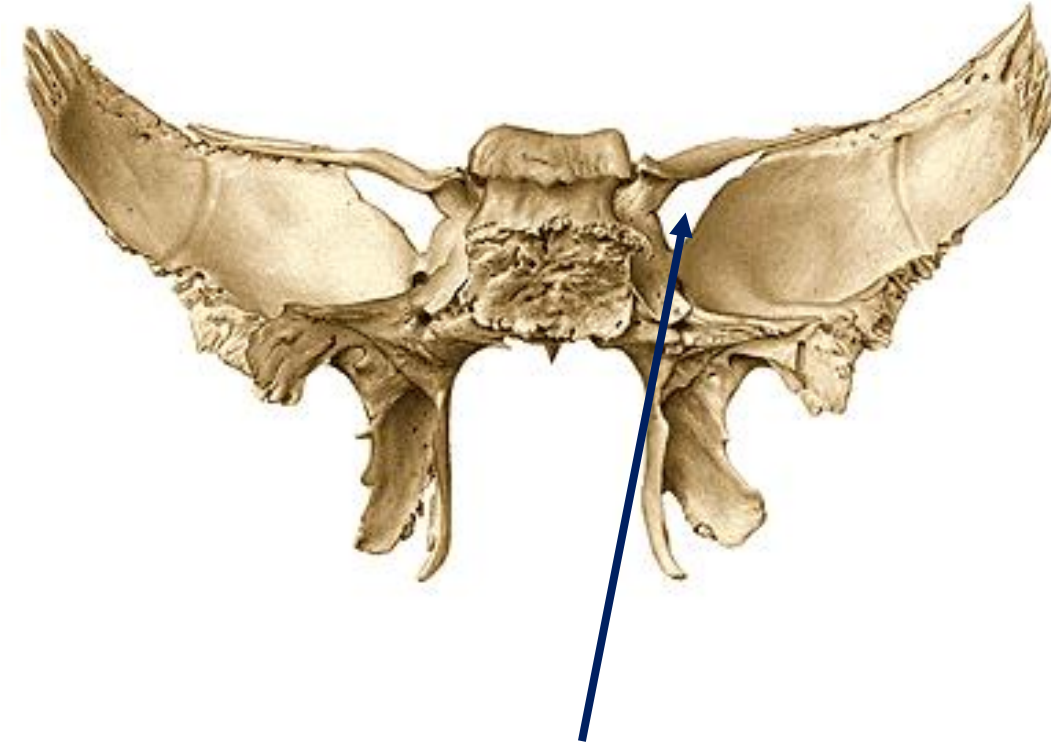
- canalis opticus
- fissura orbitalis superior
- processus clinoides anterior

Os sphenoidale

(superior view)



(posterior view)



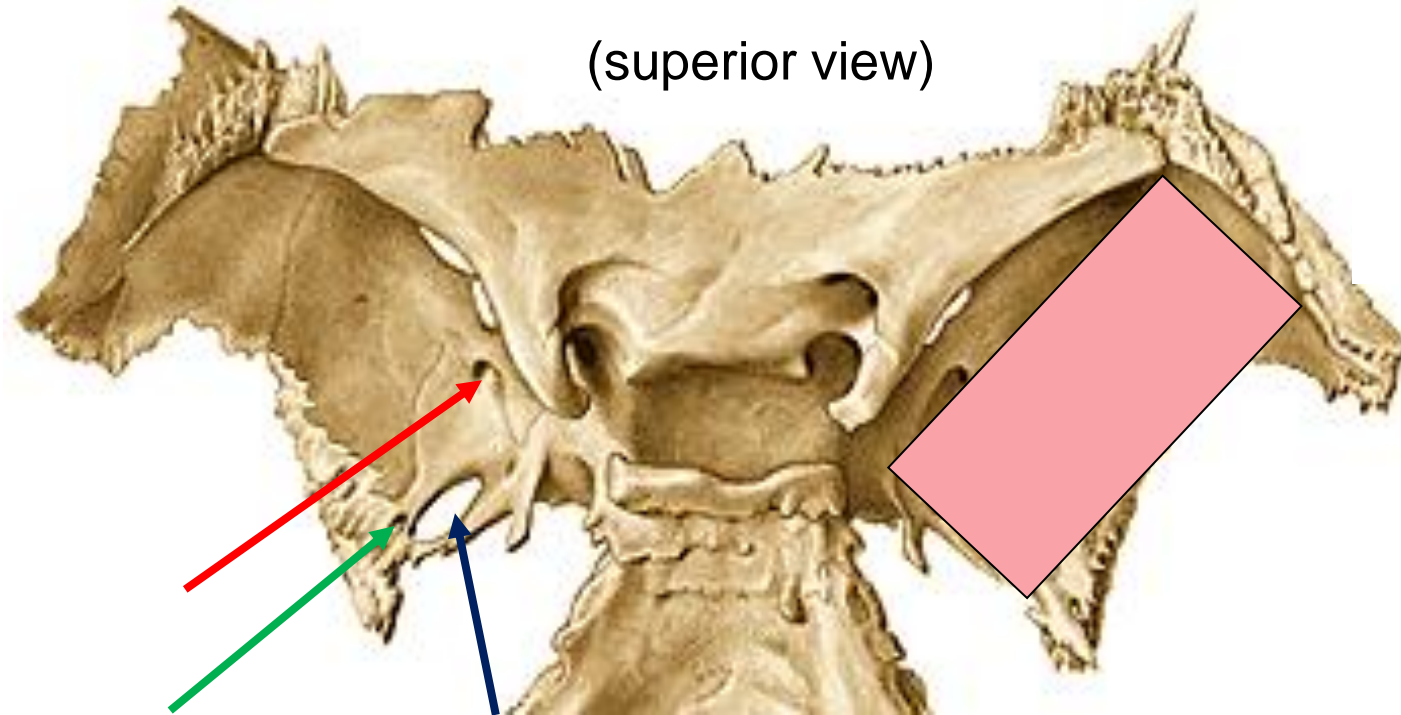
Ala major - facies cerebralis:

- foramen rotundum
- foramen ovale
- foramen spinosum

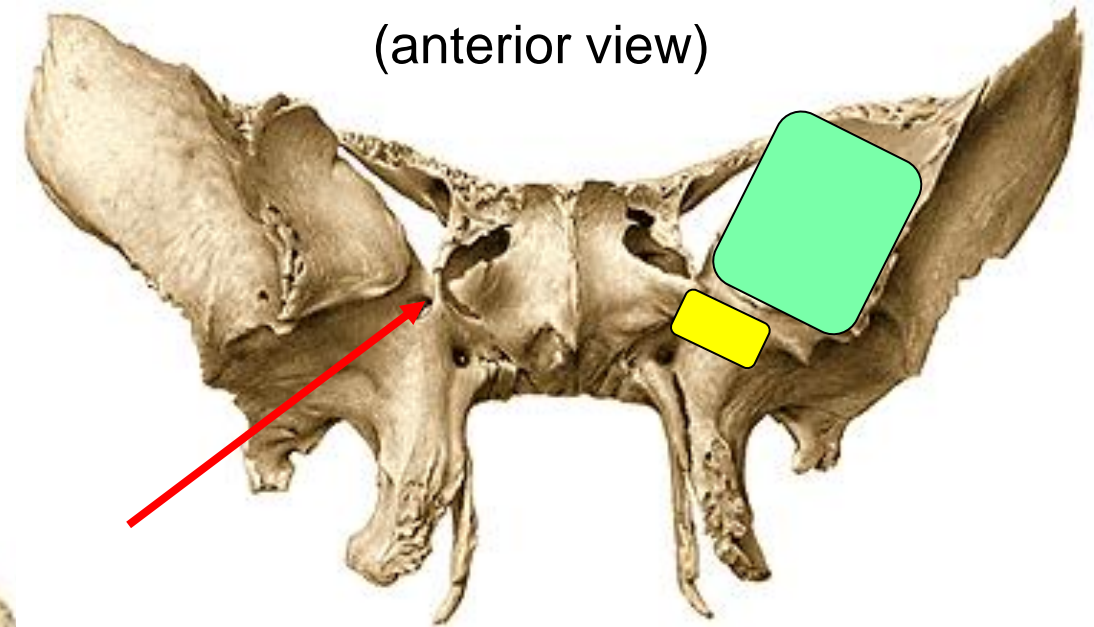
Ala major - facies orbitalis

Ala major - facies maxillaris

- foramen rotundum



Os sphenoidale



Ala major - facies orbitalis:

Ala major - facies maxillaris:

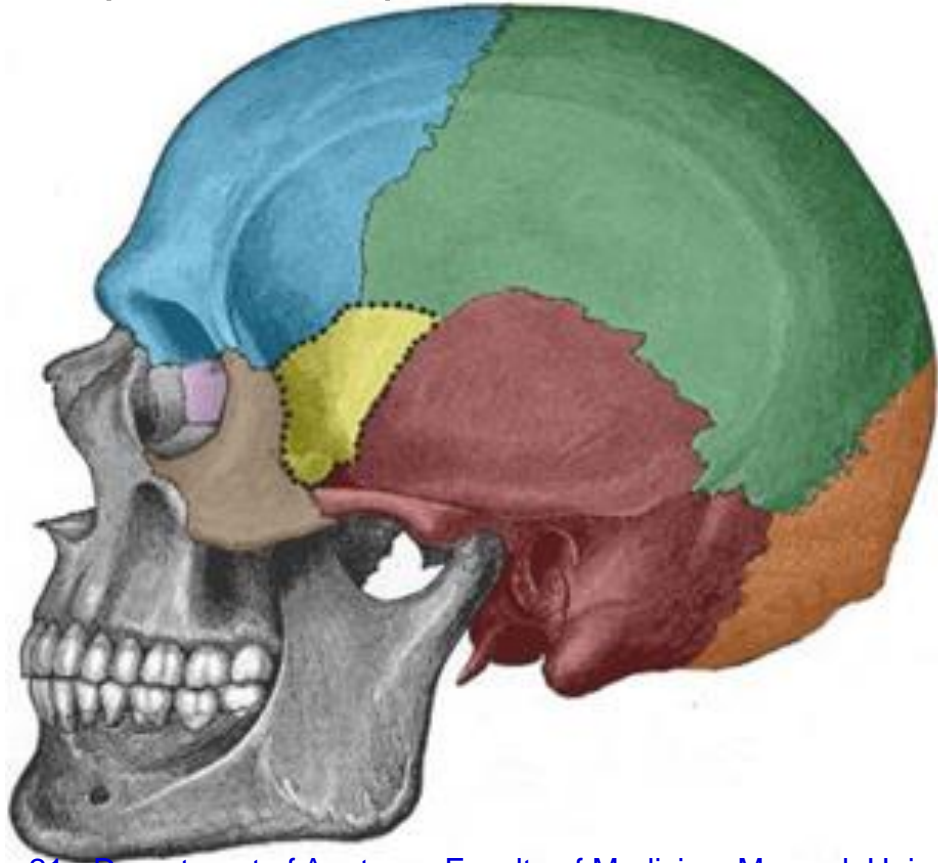
- foramen rotundum

Ala major - facies temporalis:

- crista infratemporalis

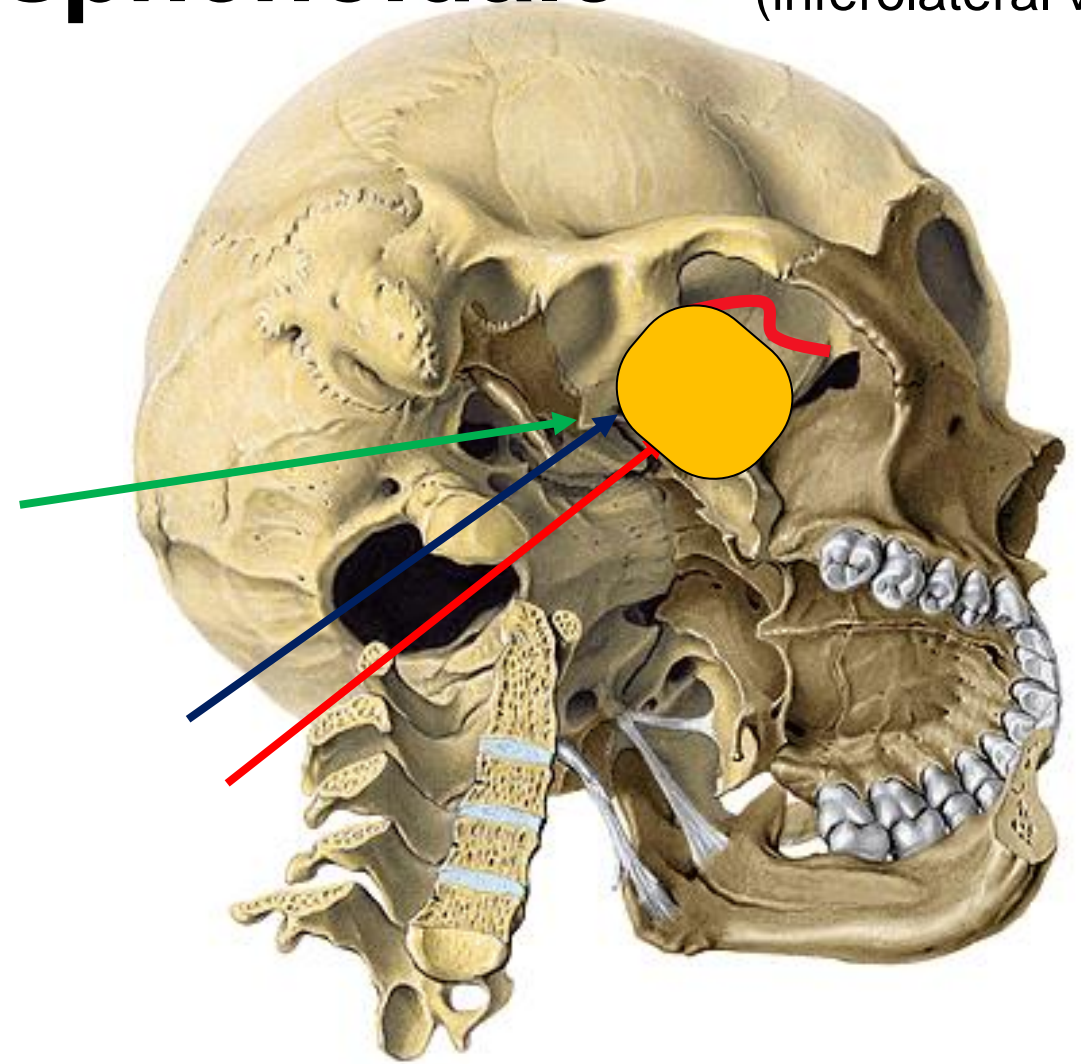
Ala major - facies infratemporalis:

- foramen ovale
- foramen spinosum
- spina ossis sphenoidalis



Os sphenoidale

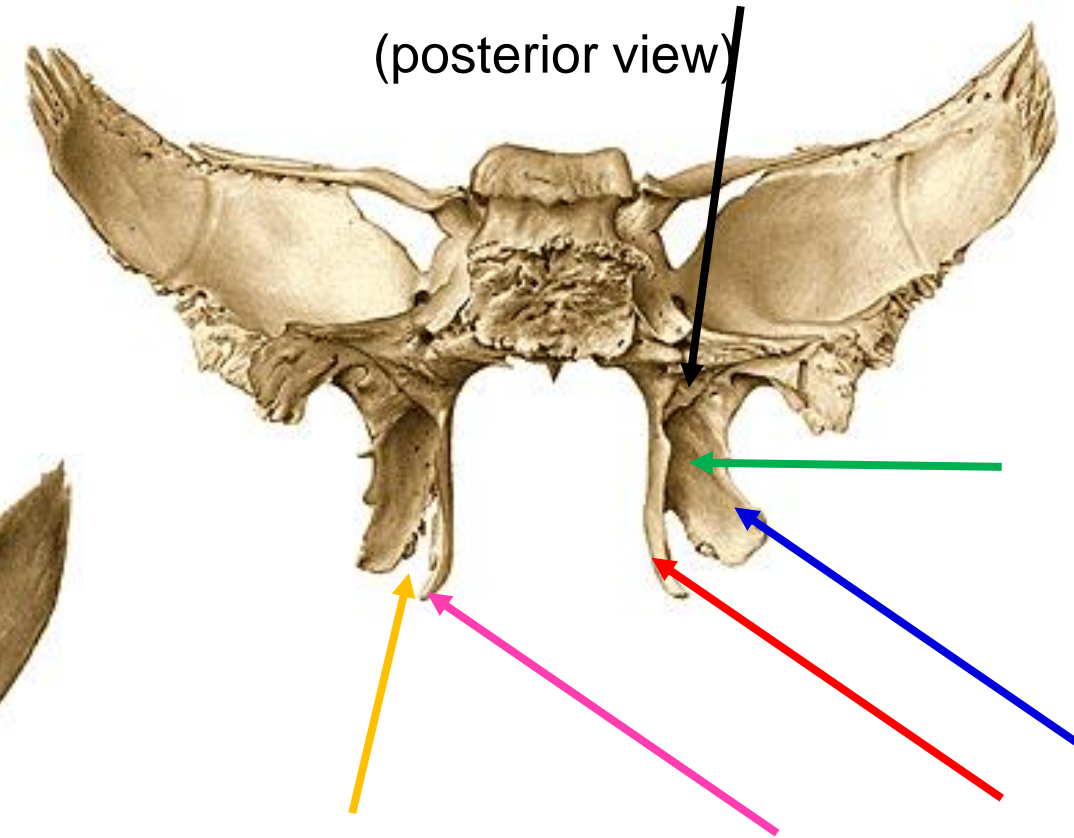
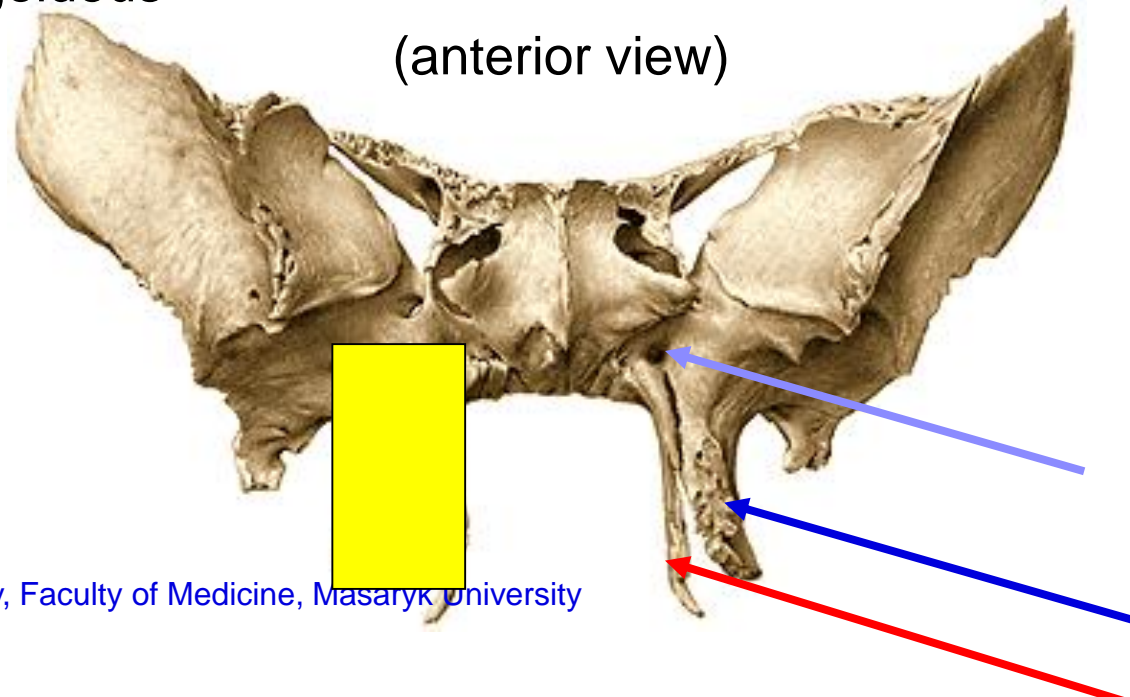
(inferolateral view)



Os sphenoidale

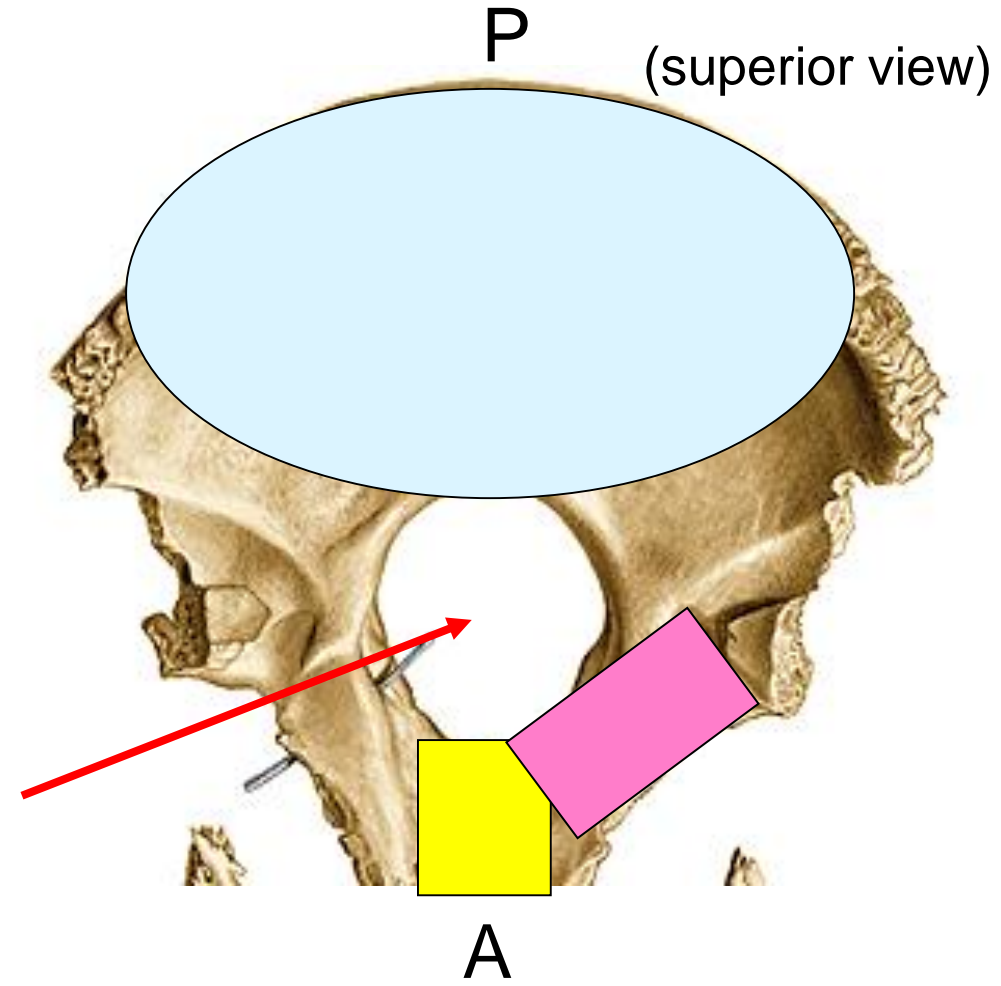
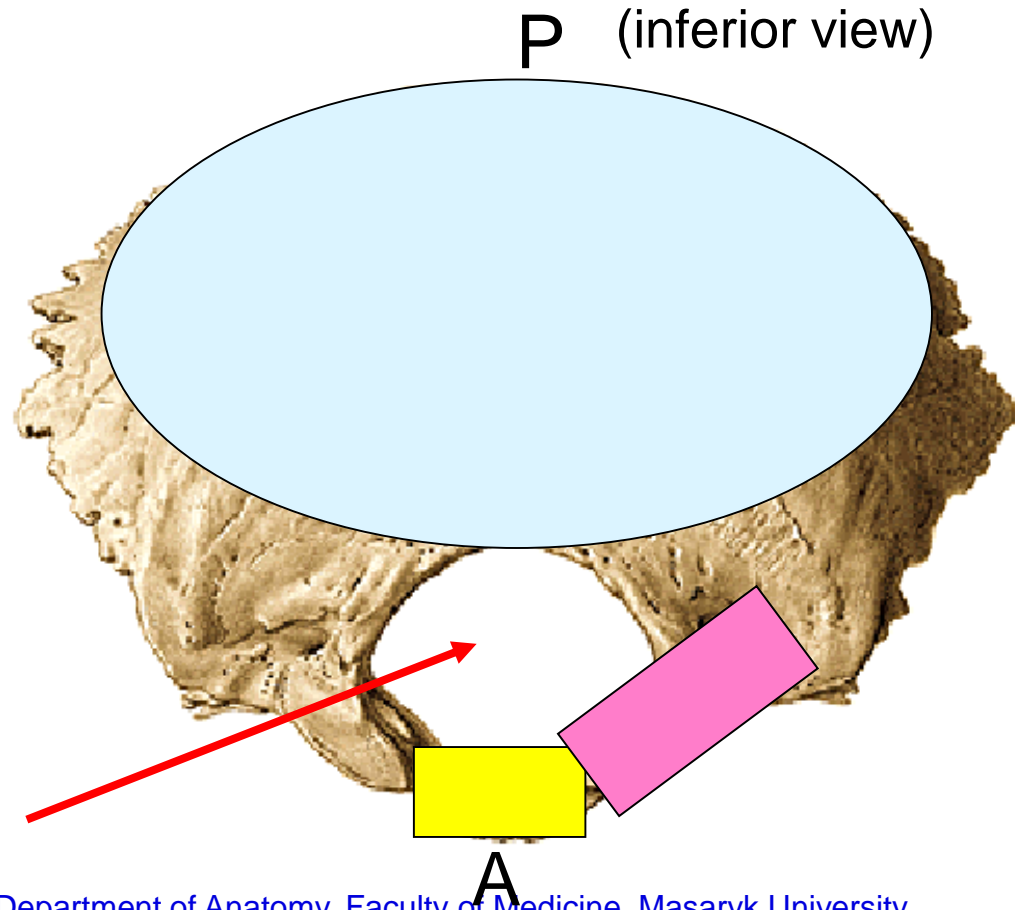
Processus pterygoideus:

- lamina medialis
- lamina lateralis
- fossa pterygoidea
- incisura pterygoidea
- fossa scaphoidea
- hamulus pterygoideus
- canalis pterygoideus



Pars basilaris
Pars lateralis
Squama occipitalis
Foramen magnum

Os occipitale



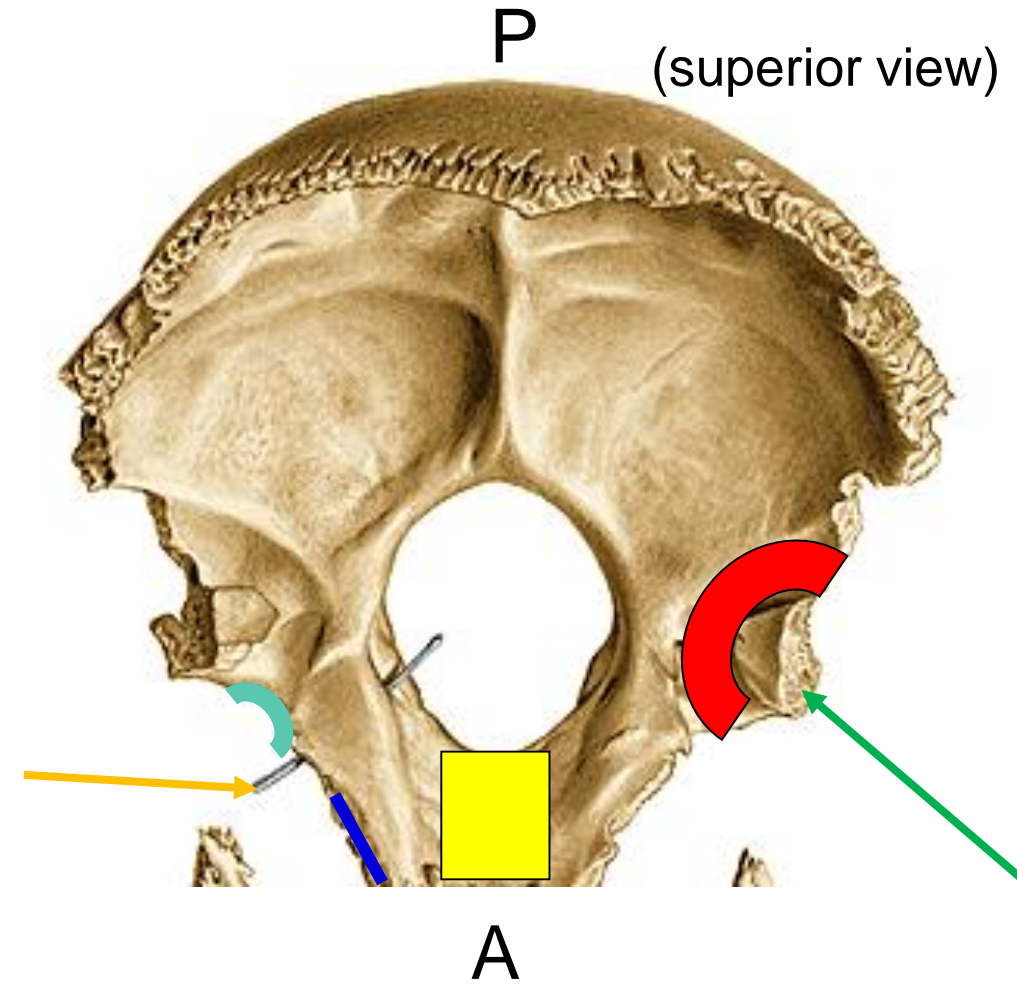
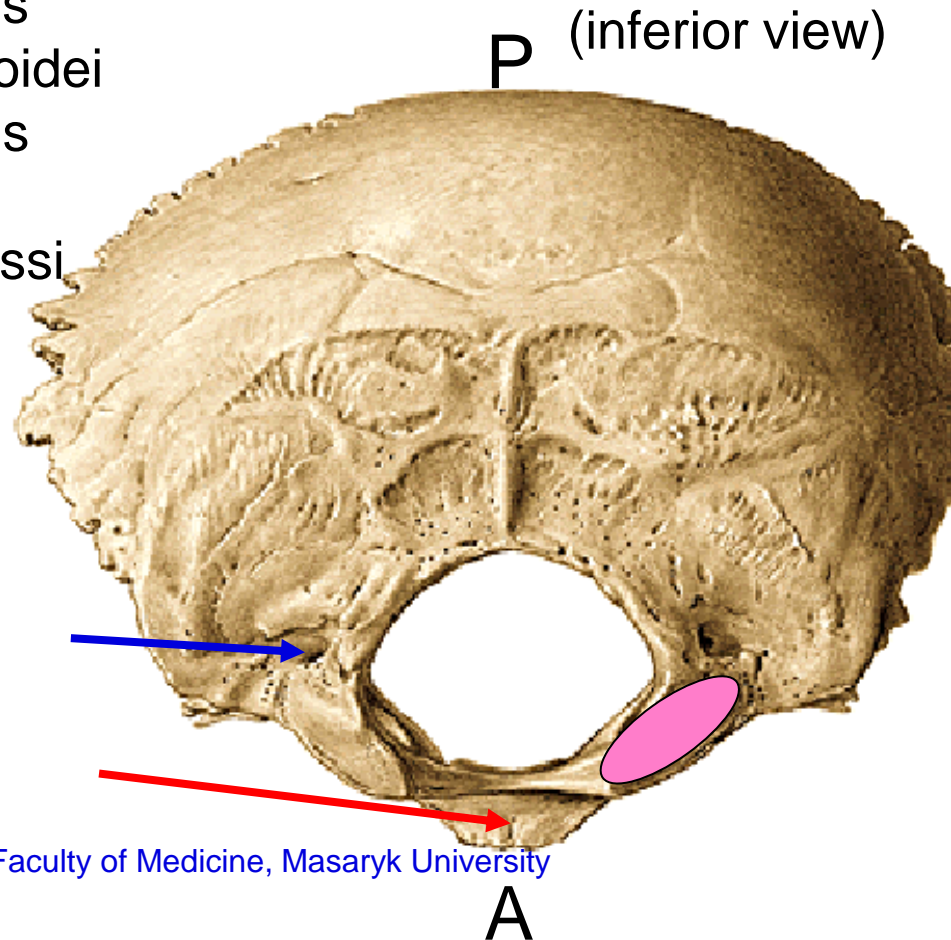
Pars basilaris:

- clivus
- tuberculum pharyngeum

Pars lateralis:

- sulcus sinus petrosi inferioris
- incisura jugularis
- processus jugularis
- sulcus sinus sigmoidei
- condylus occipitalis
- fossa condylaris
- canalis n. hypoglossi

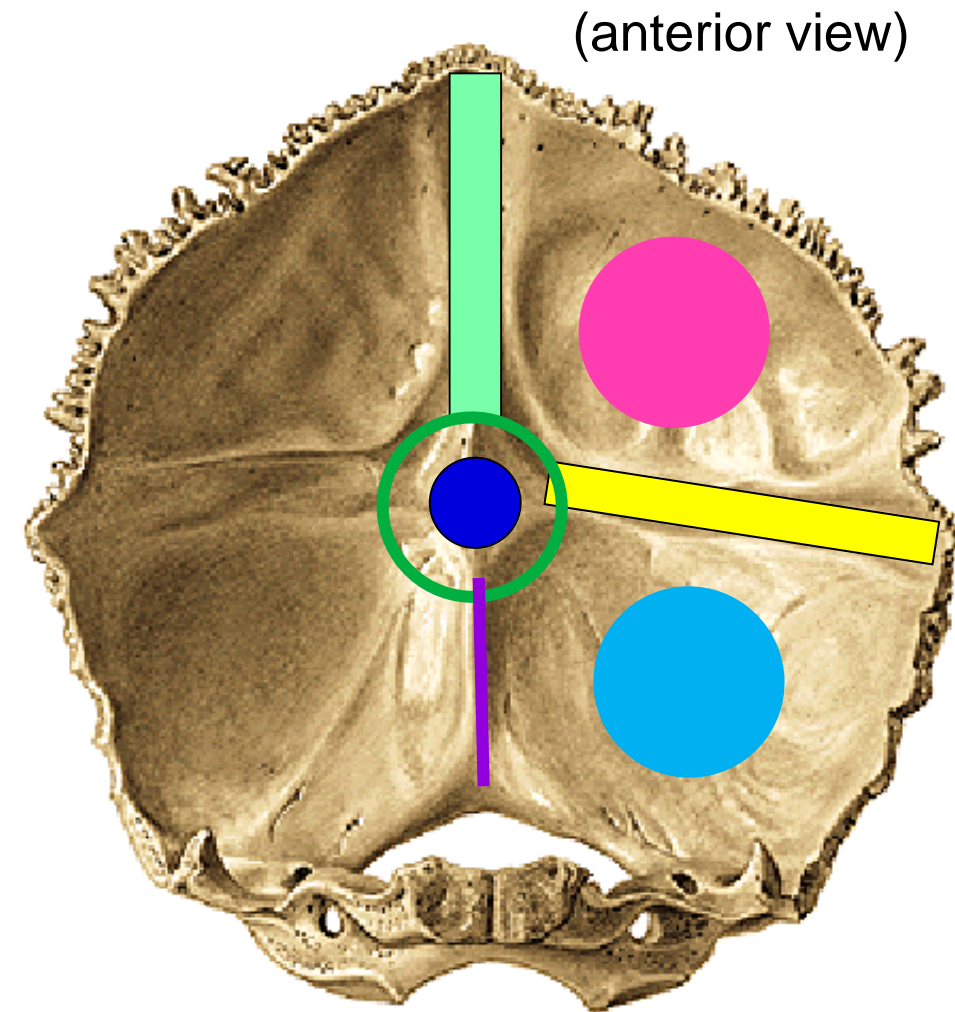
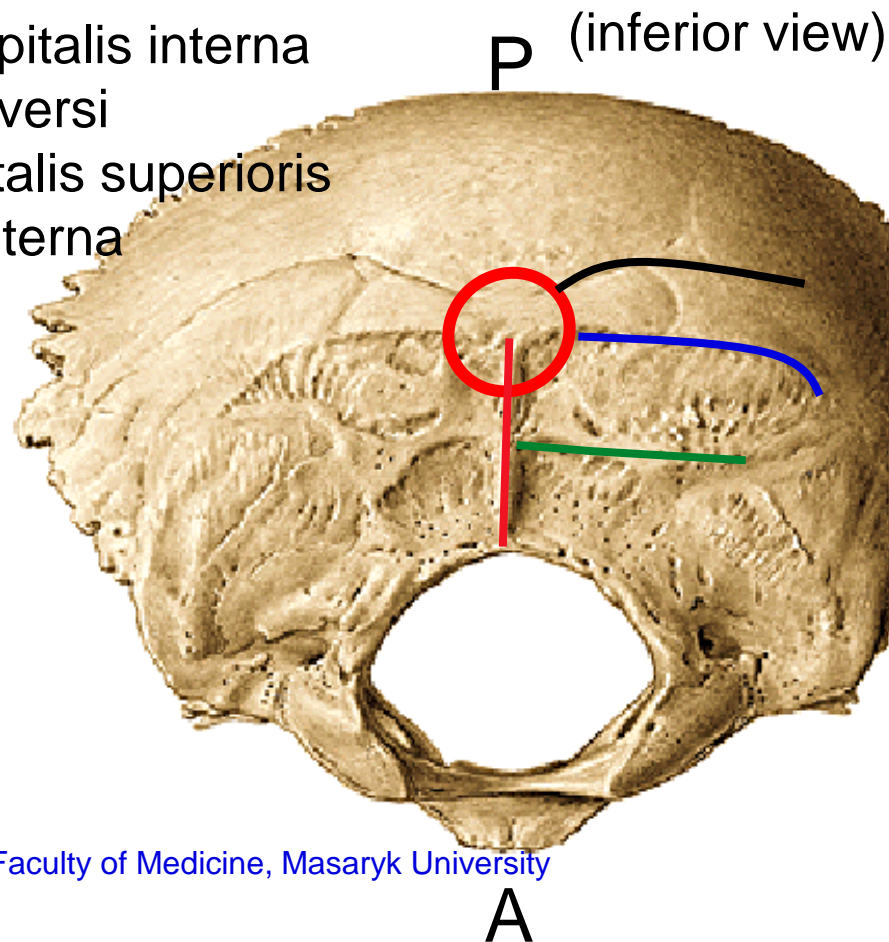
Os occipitale



Squama occipitalis:

- protuberantia occipitalis externa
- linea nuchae superior
- linea nuchae suprema
- linea nuchae inferior
- crista occipitalis externa
- eminentia cruciformis
- protuberantia occipitalis interna
- sulcus sinus transversus
- sulcus sinus sagittalis superioris
- crista occipitalis interna
- fossa cerebellaris
- fossa cerebralis

Os occipitale



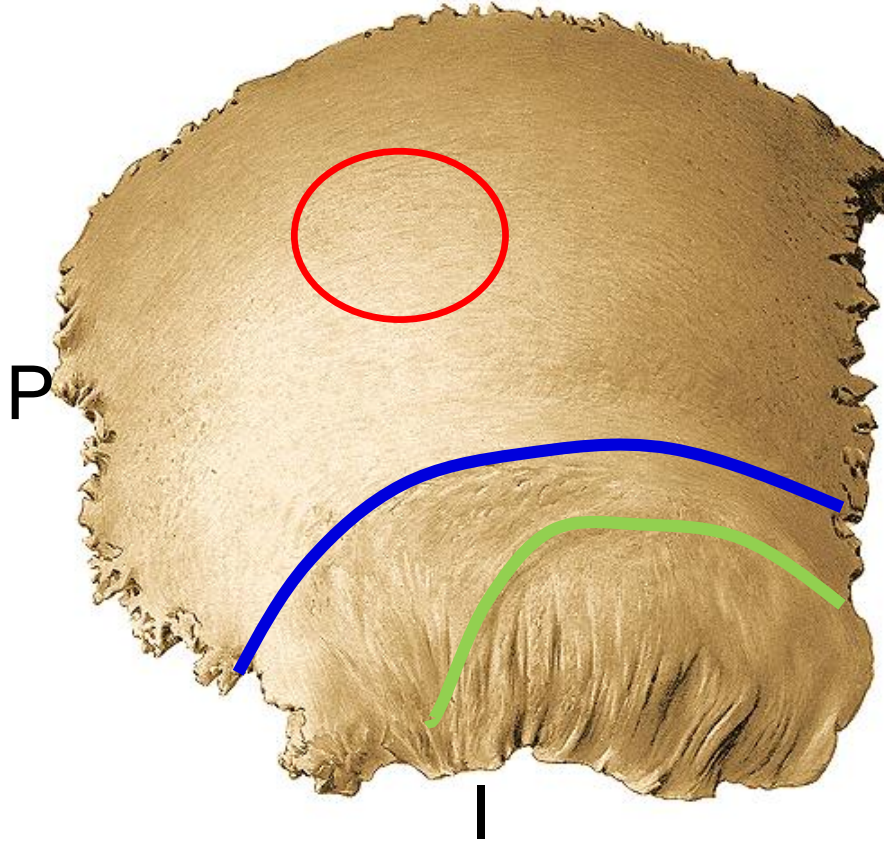
Os parietale

Facies externa:

- tuber parietale
- linea temporalis superior
- linea temporalis inferior

- Angulus frontalis
- Angulus sphenoidalis
- Angulus occipitalis
- Angulus mastoideus

(right, lateral view) S

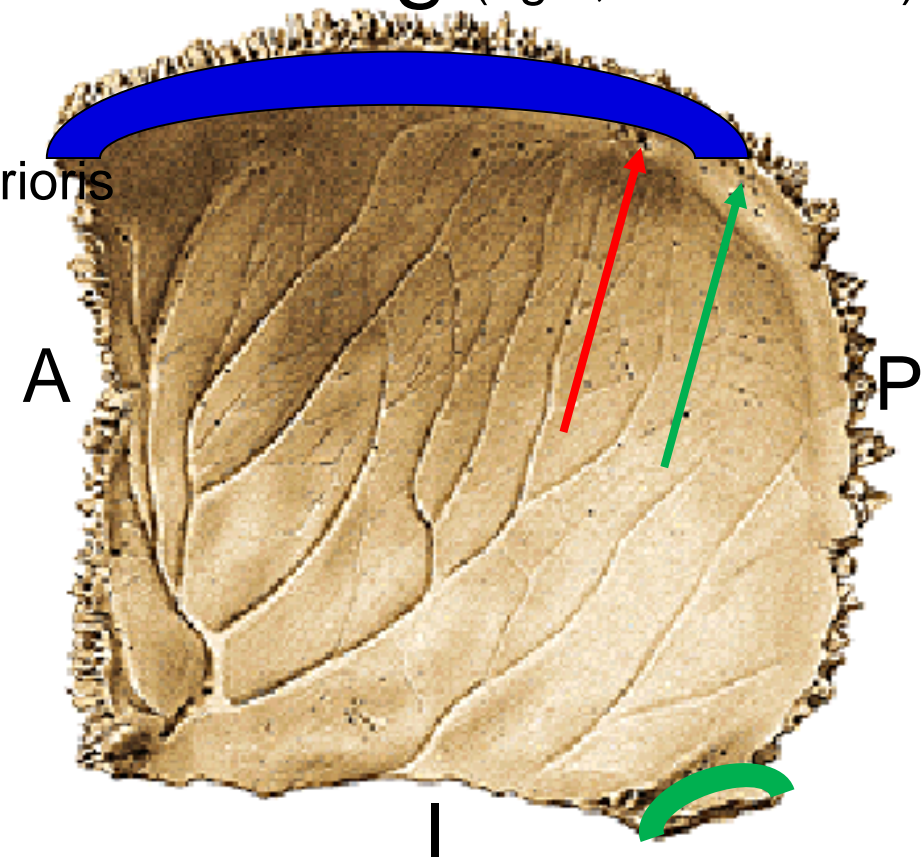


Facies interna

- impressioes gyrorum
- juga cerebralia
- sulci arteriosi
- sulcus sinus sagittalis superioris
- foveolae granulares
- A foramen parietale
- sulcus sinus sigmoidei

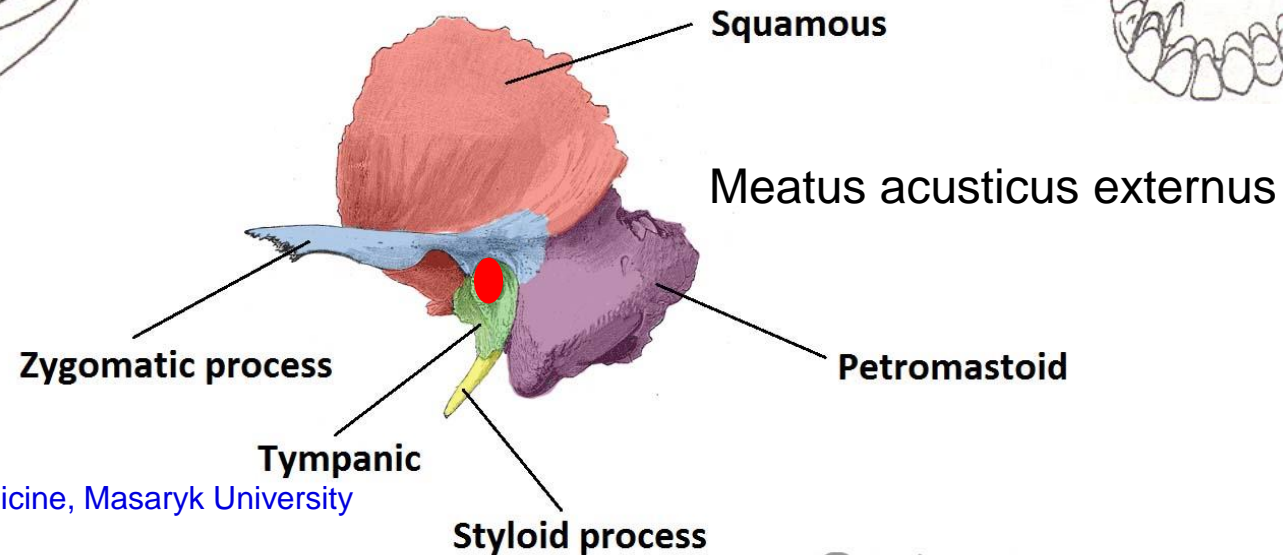
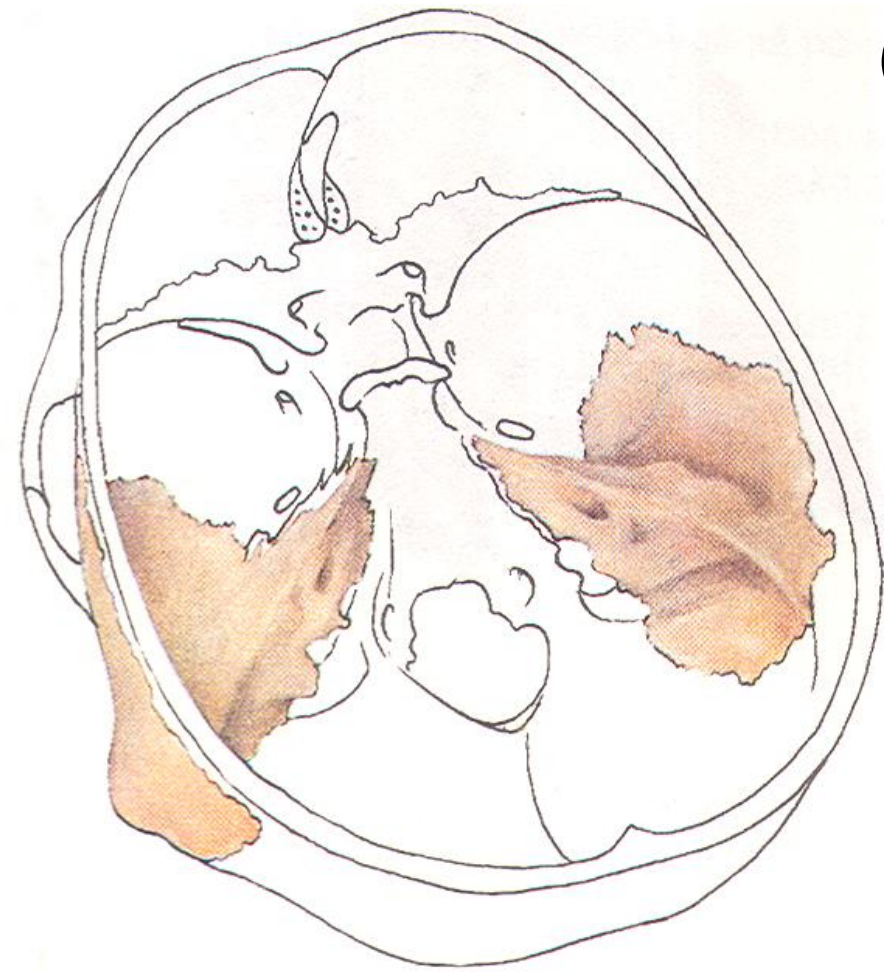
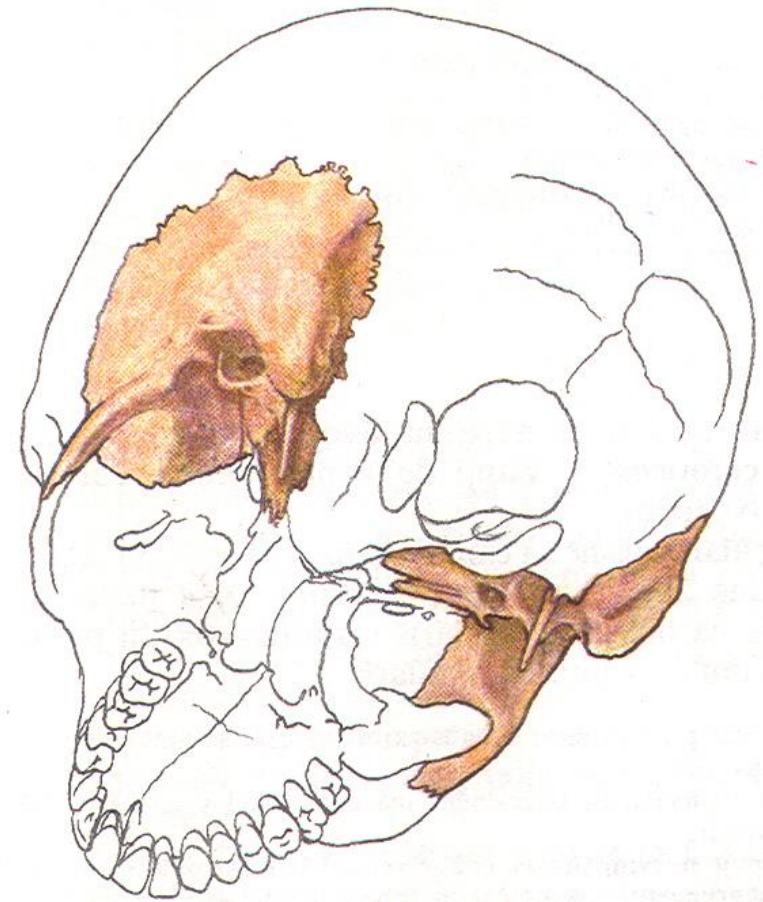
- Margo sagittalis
- Margo squamosa
- Margo frontalis
- Margo occipitalis

S (right, medial view)



Os temporale

- Pars squamosa
- Pars petrosa (pyramis)
- Pars tympanica
- Pars mastoidea
- Processus styloideus

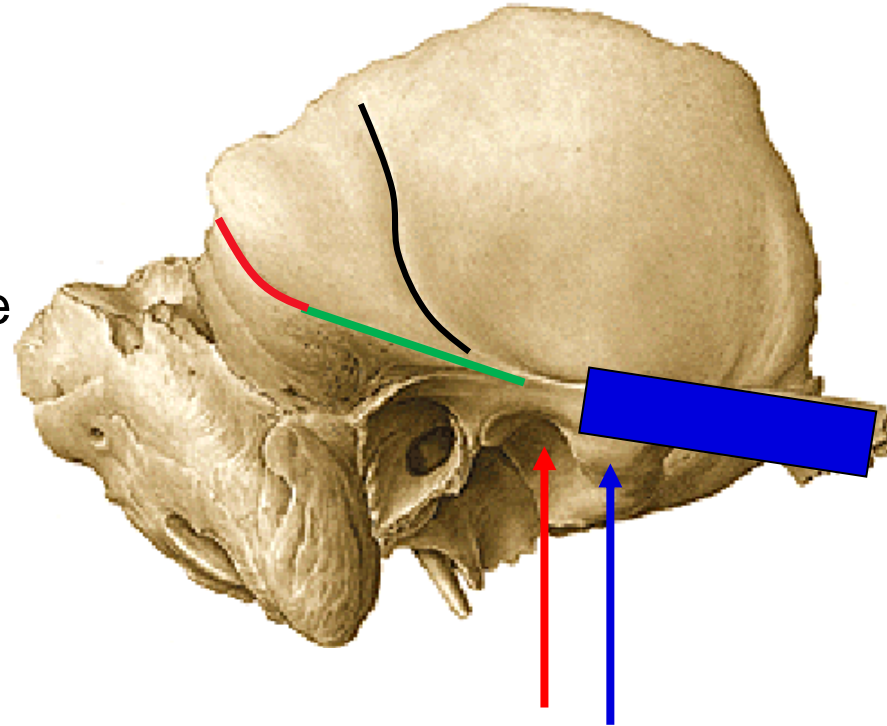


Pars squamosa:

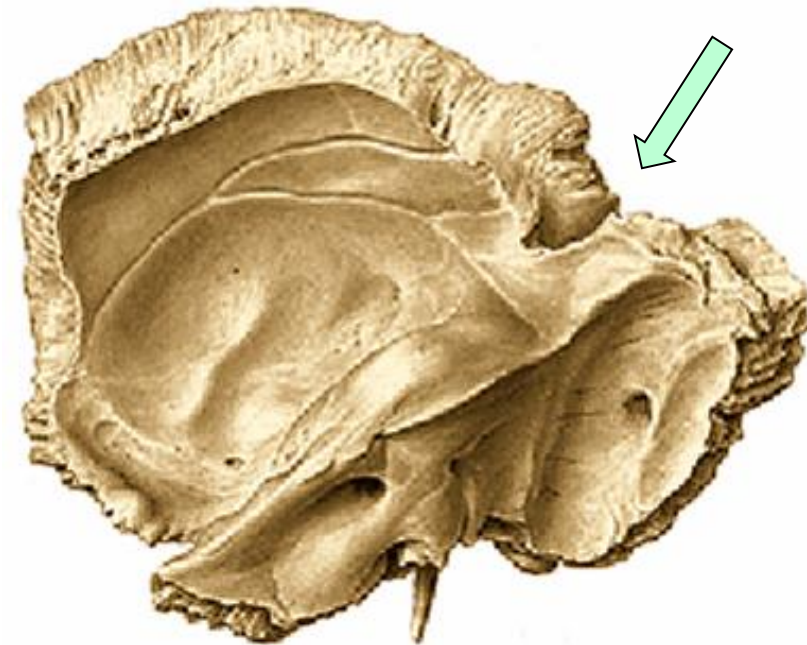
- facies temporalis
 - processus zygomaticus
 - crista supramastoidea
 - linea temporalis
 - fossa mandibularis
 - tuberculum articulare
 - sulcus a. temporalis mediae
- facies cerebralis
 - impressiones gyrorum
 - juga cerebralia
 - sulci arteriosi
- margo sphenoidalis
- margo parietalis
- incisura parietalis

Os temporale

(right, lateral view)



(right, medial view)

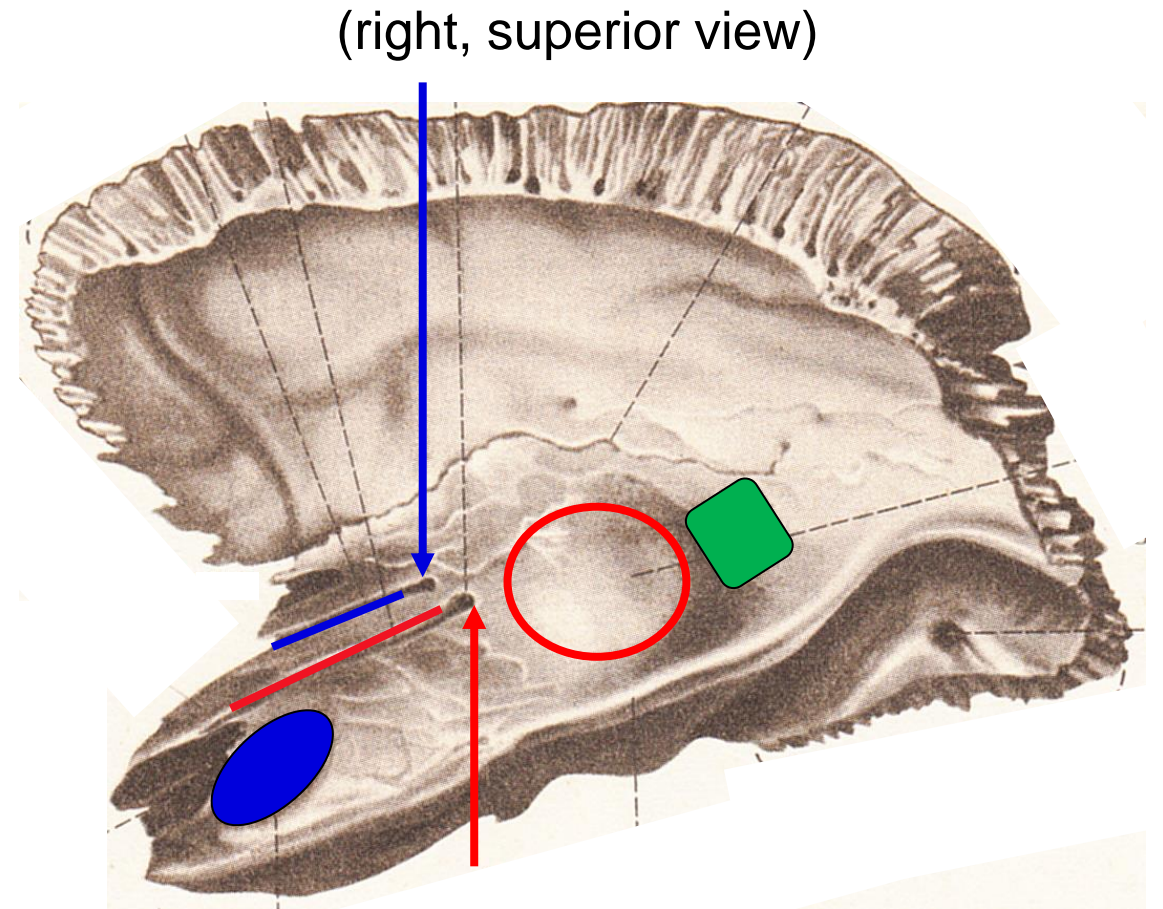


Os temporale

Pars petrosa (pyramis):

Facies anterior:

- eminentia arcuata
- tegmen tympani
- hiatus canalis n. petrosi majoris
- sulcus n. petrosi majoris
- hiatus canalis n. petrosi minoris
- sulcus n. petrosi minoris
- impressio trigemini



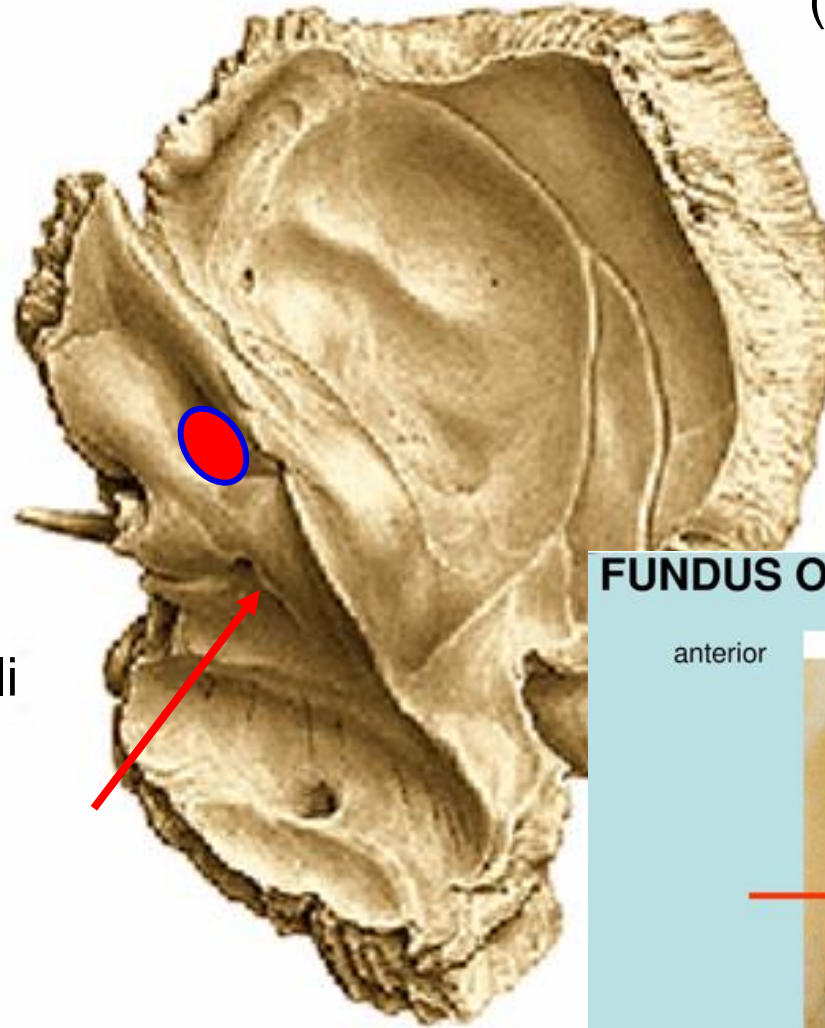
Os temporale

(right, superior view)

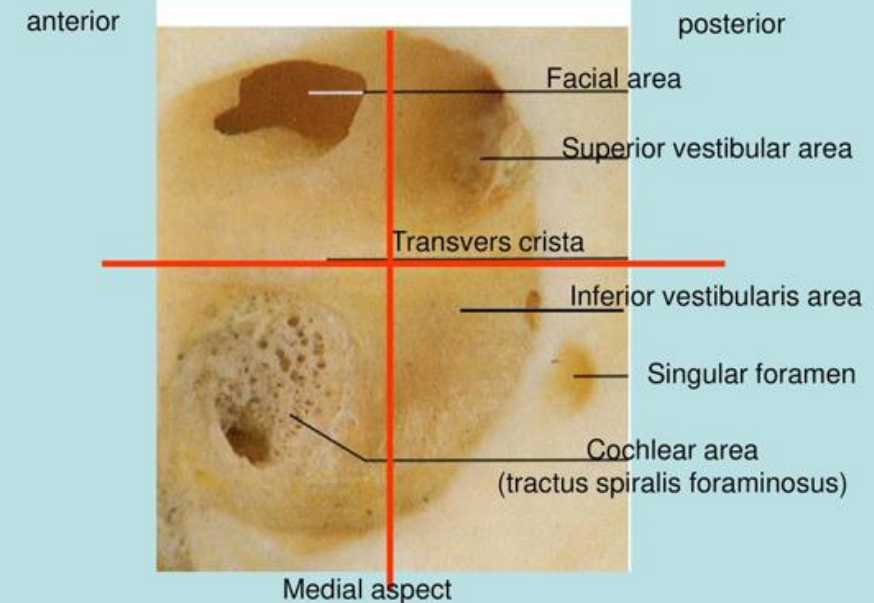
Pars petrosa (pyramis):

Facies posterior:

- porus acusticus internus
- meatus acusticus internus
- fundus meatus acustici interni
- apertura externa aquaeductus vestibuli



FUNDUS OF INTERNAL ACUSTIC MEATUS



Os temporale

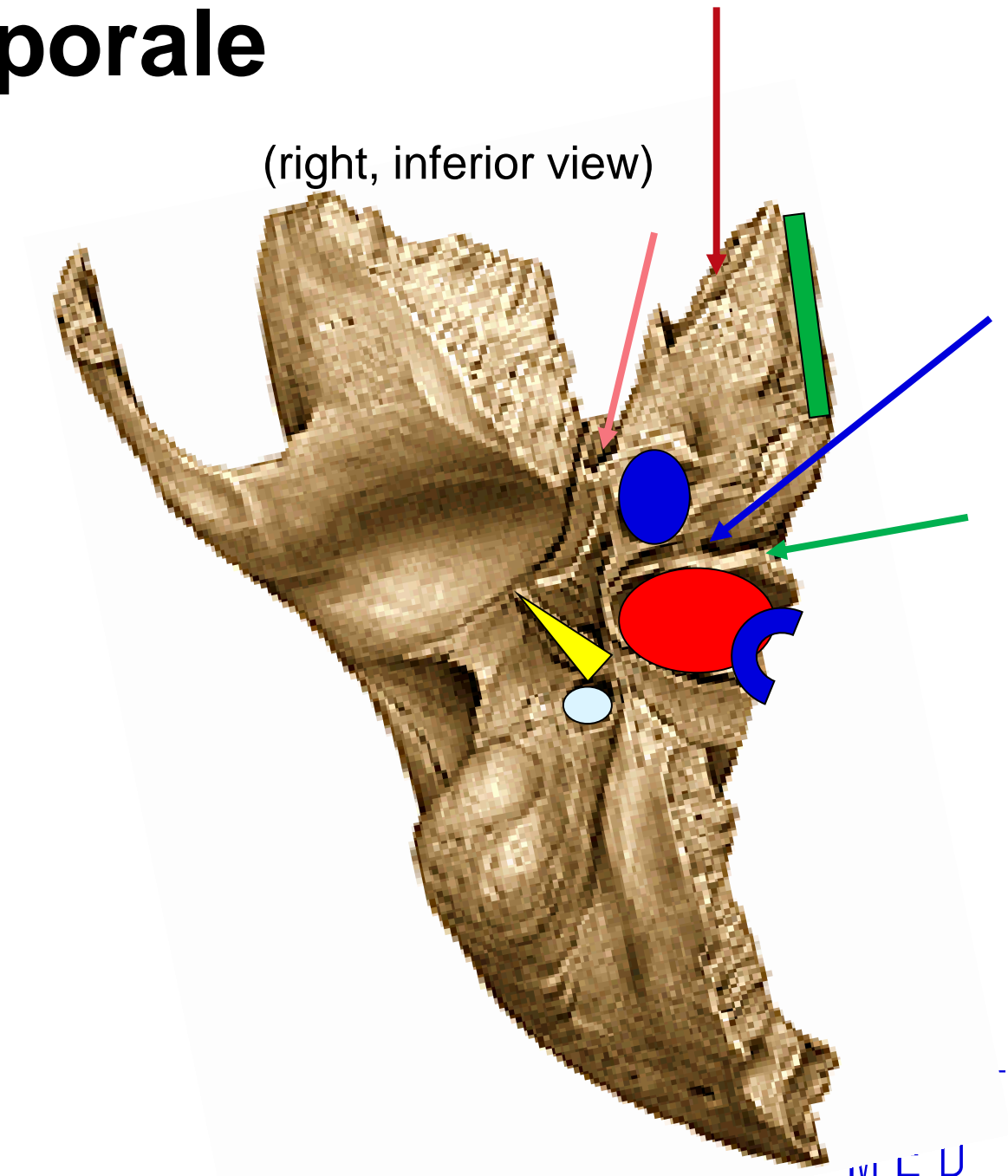
Pars petrosa (pyramis):

Facies inferior:

- fossa jugularis
- canaliculus mastoideus
- incisura jugularis
- processus intrajugularis
- apertura externa canalis carotici
- fossula petrosa
- apertura externa canaliculi tympanici
- apertura externa canaliculi cochlae
- sulcus sinus petrosi inferioris
- apertura interna canalis carotici
- canalis musculotubarius

Processus styloideus

- foramen stylomastoideum



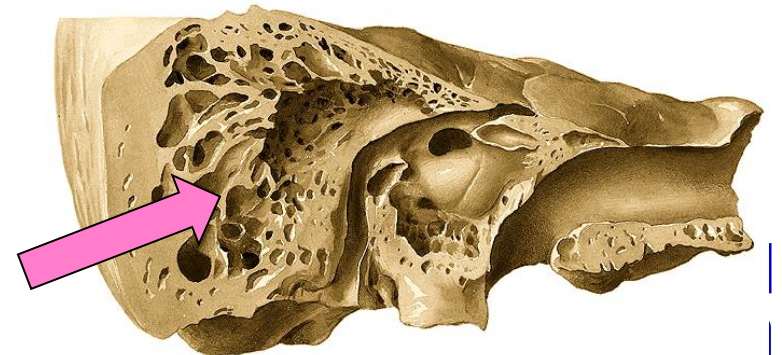
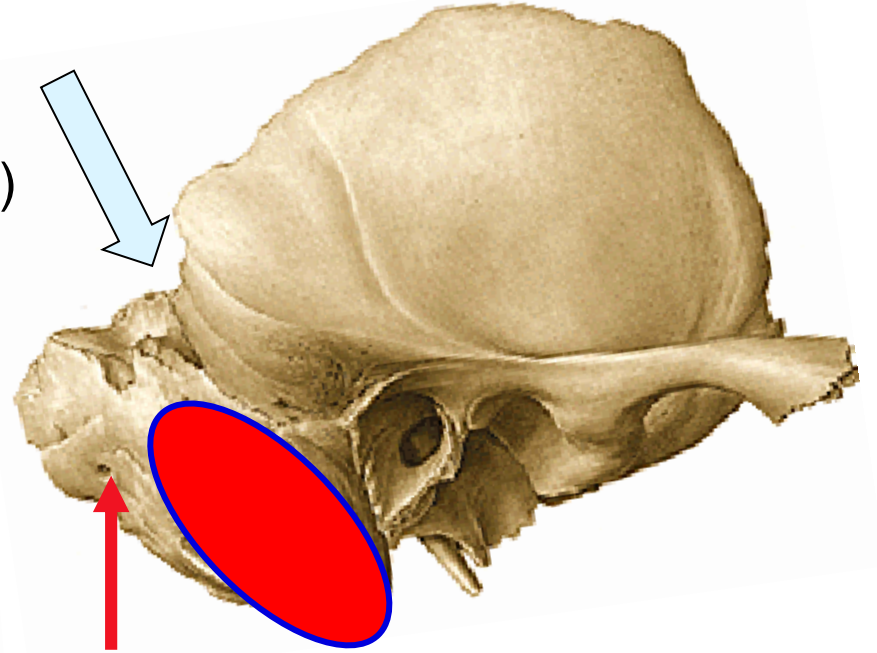
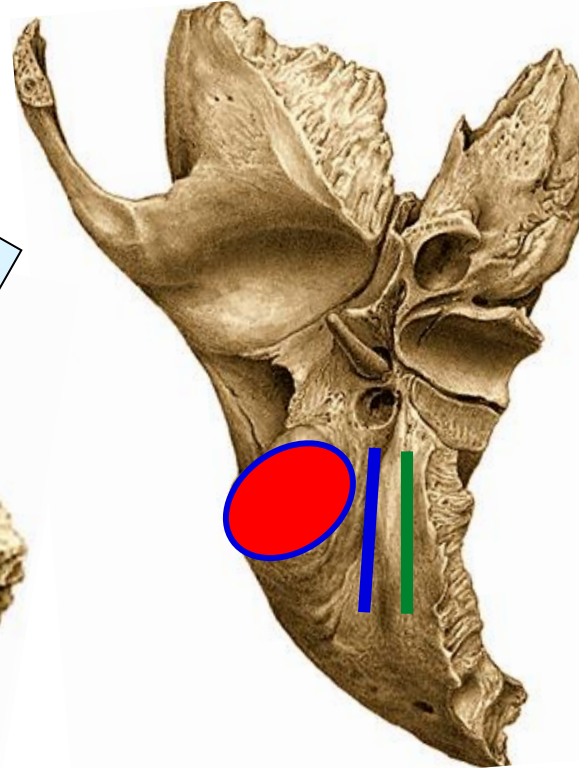
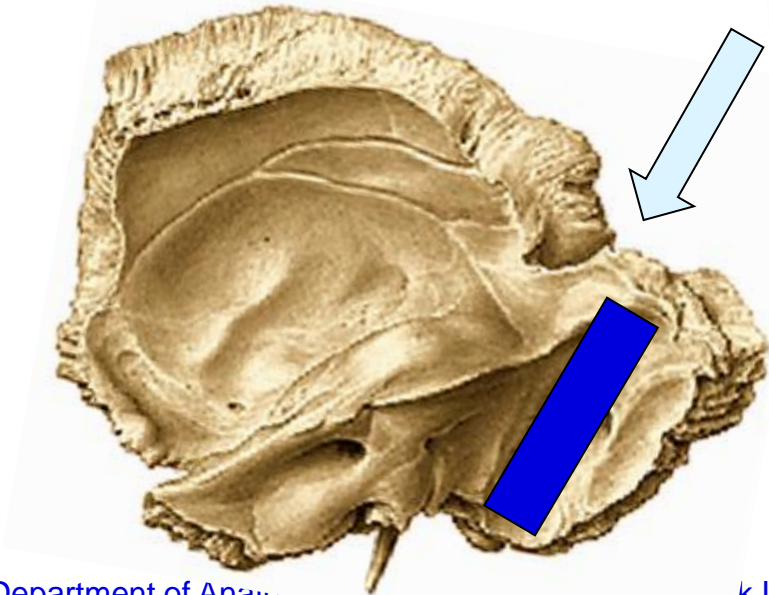
Pars mastoidea:

- processus mastoideus
- cellulae mastoideae
- incisura mastoidea
- sulcus a. occipitalis
- foramen mastoideum
- sulcus sinus sigmoidei
- margo occipitalis
- margo parietalis
- incisura parietalis

Os temporale

(right, lateral view)

(right, inferior view)



Pars tympanica

- sulcus tympanicus
- incisura tympanica

Fissura petrotympanica

- canaliculus chordae tympani

Fissura petrosquamosa

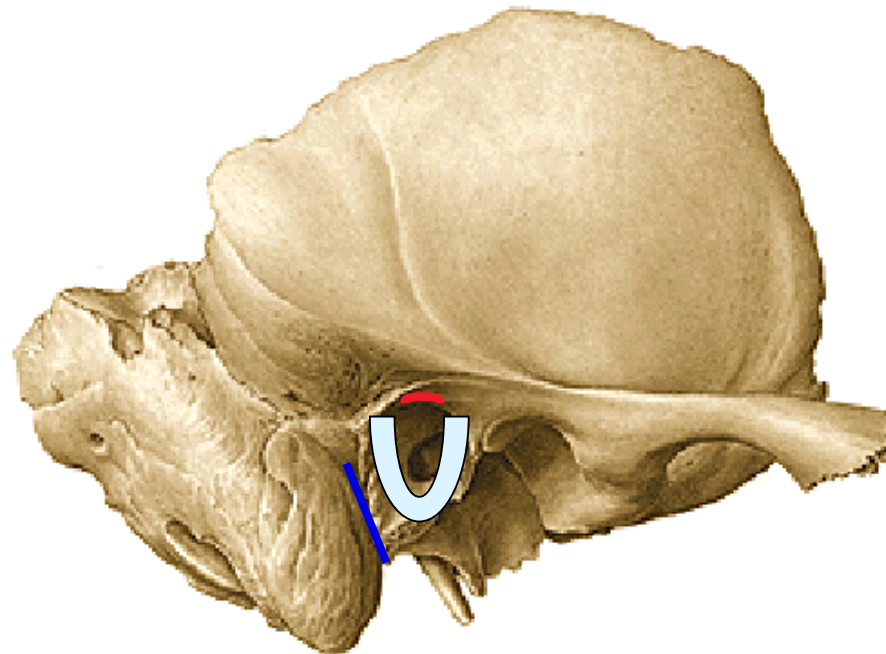
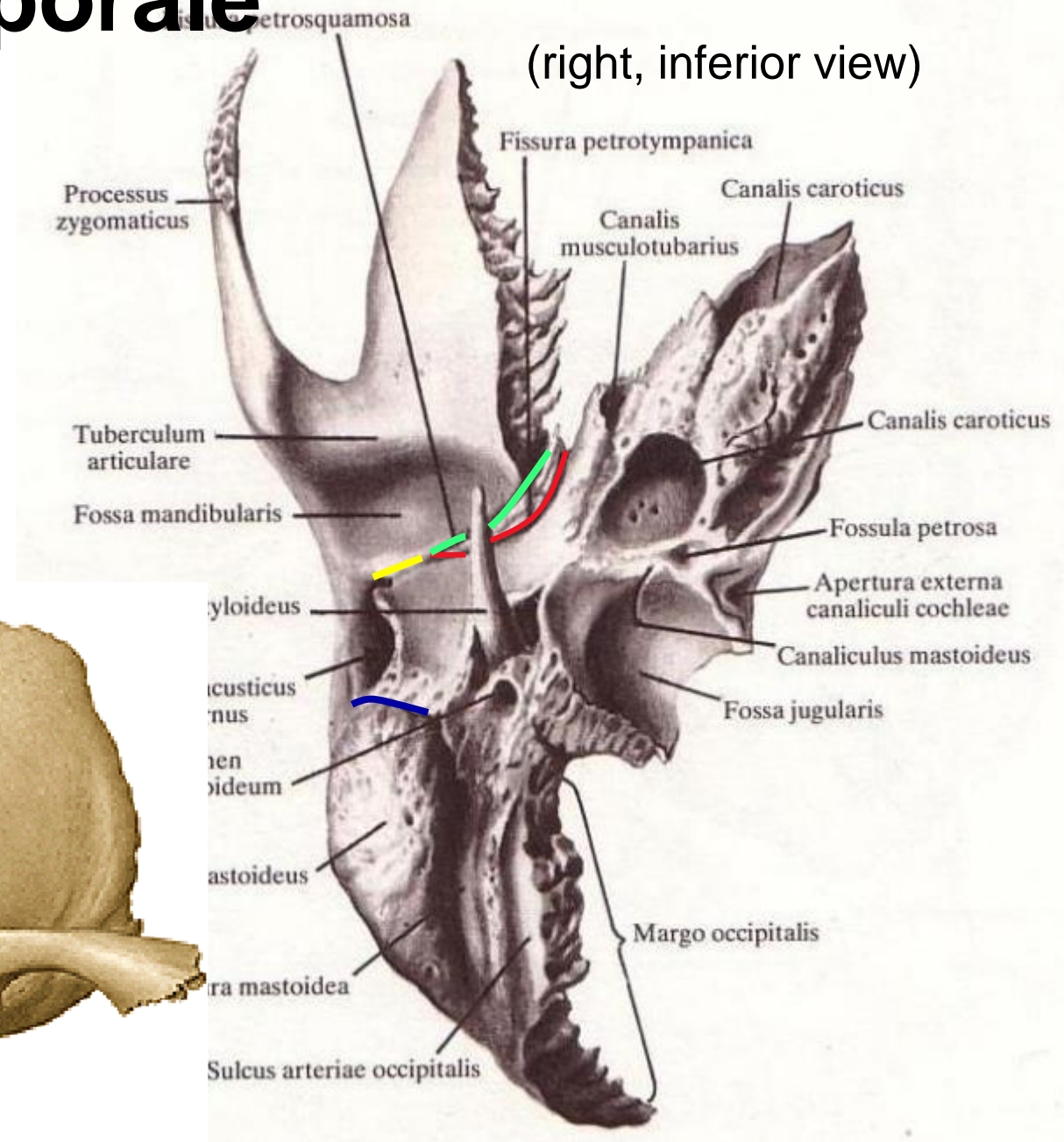
Fissura tympanosquamosa

Fissura tympanomastoidea

- apertura externa canaliculi mastoidei

Os temporale

(right, inferior view)



Canals in the temporal bone

canalis caroticus

canaliculi caroticotympanici

canalis nervi facialis

canaliculus chordae tympani

canalis musculotubarius

canaliculus tympanicus

canaliculus cochleae

canaliculus vestibuli

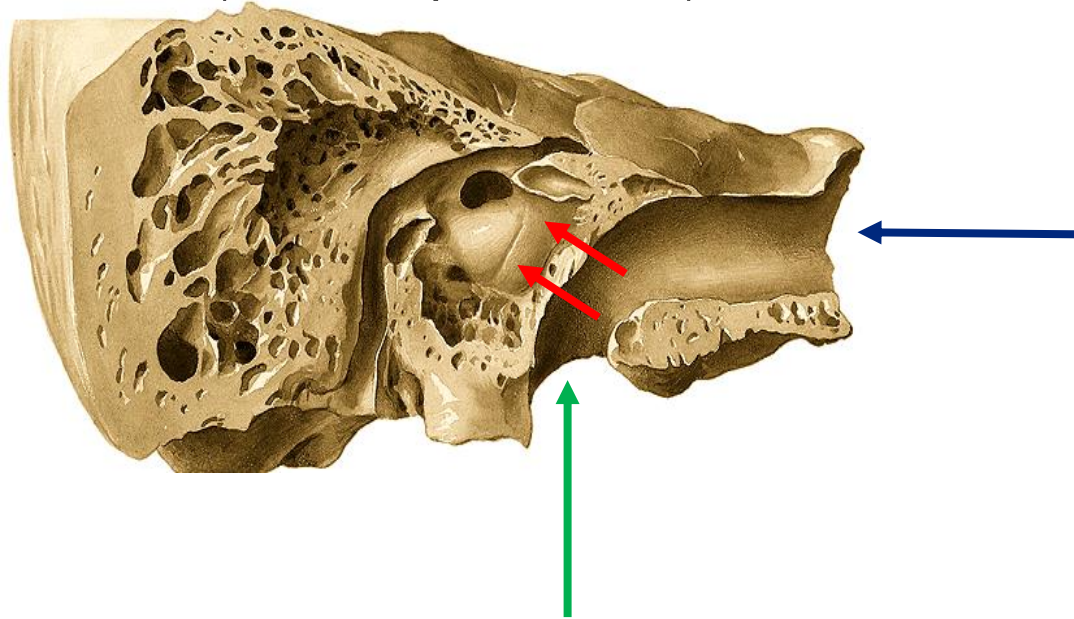
canaliculus mastoideus

Canalis caroticus and canaliculi caroticotympanici

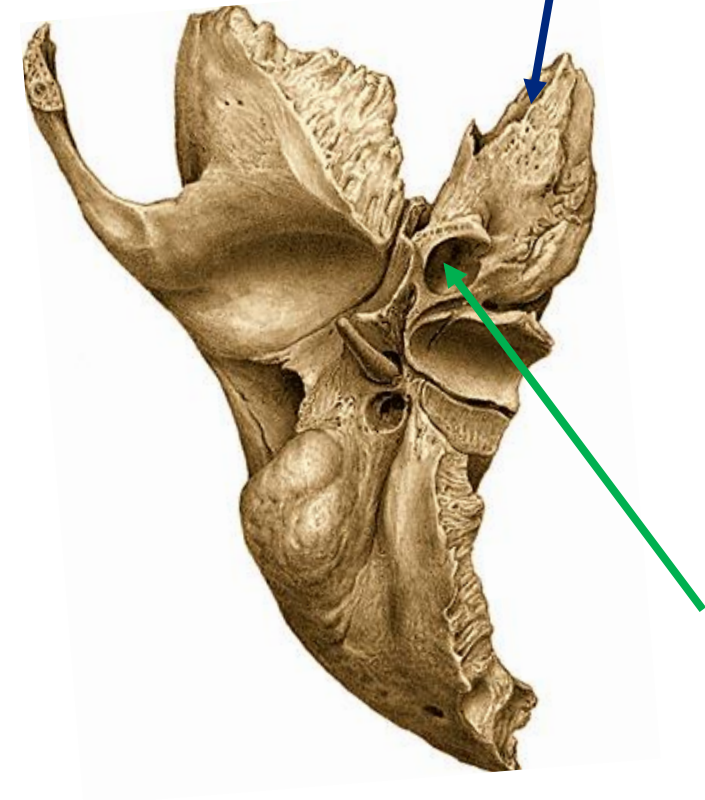
Apertura externa canalis carotici

Apertura interna canalis carotici

(left, oblique section)



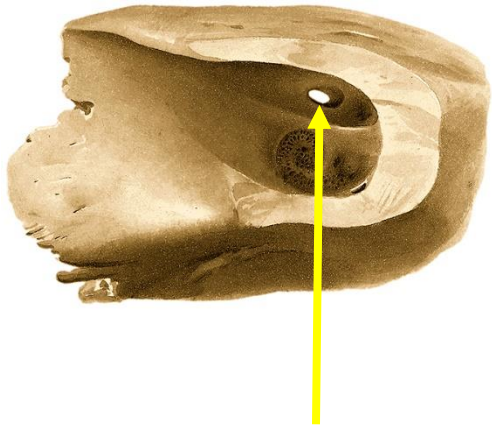
(right, inferior view)



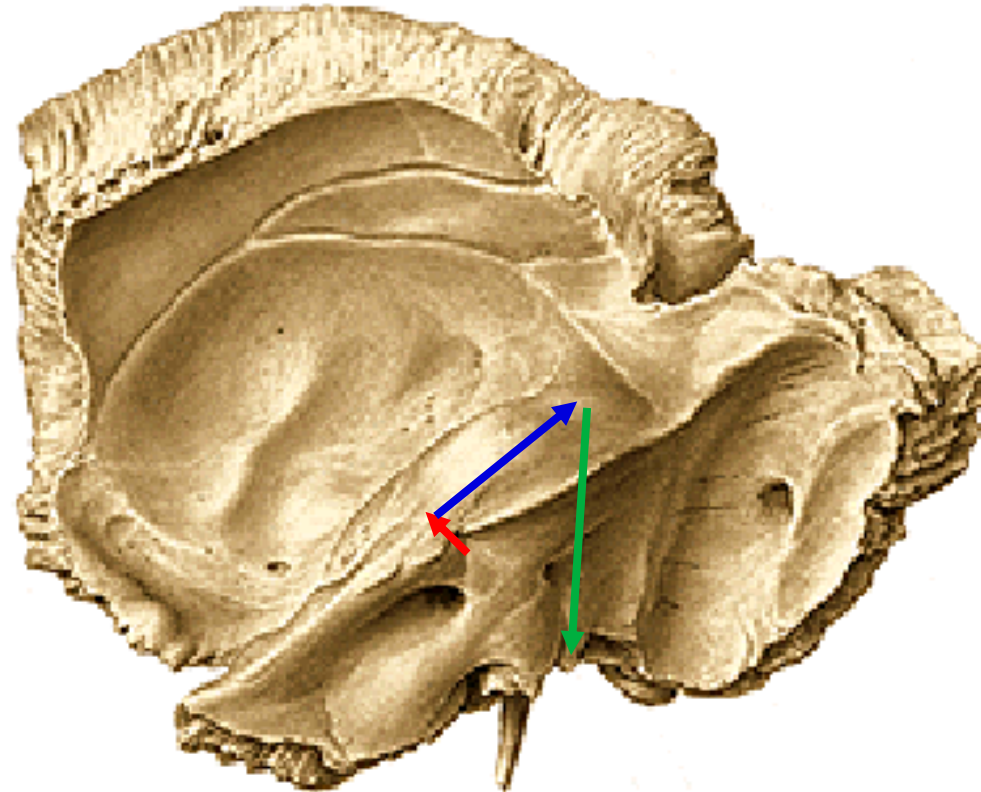
Area n. facialis
Foramen stylomastoideum
Genu externum

Canalis nervi facialis

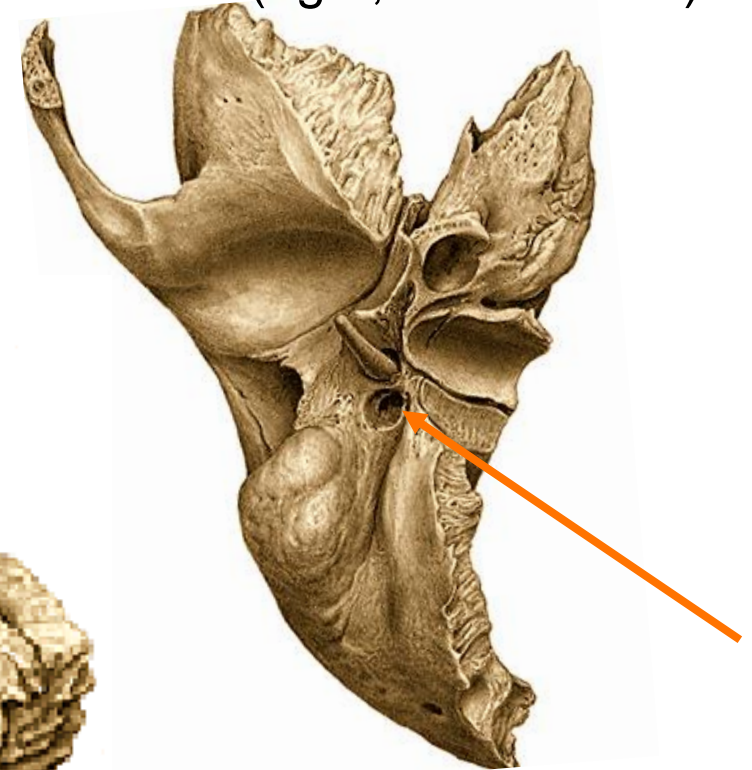
(right, posterior view)



(right, posterosuperior view)



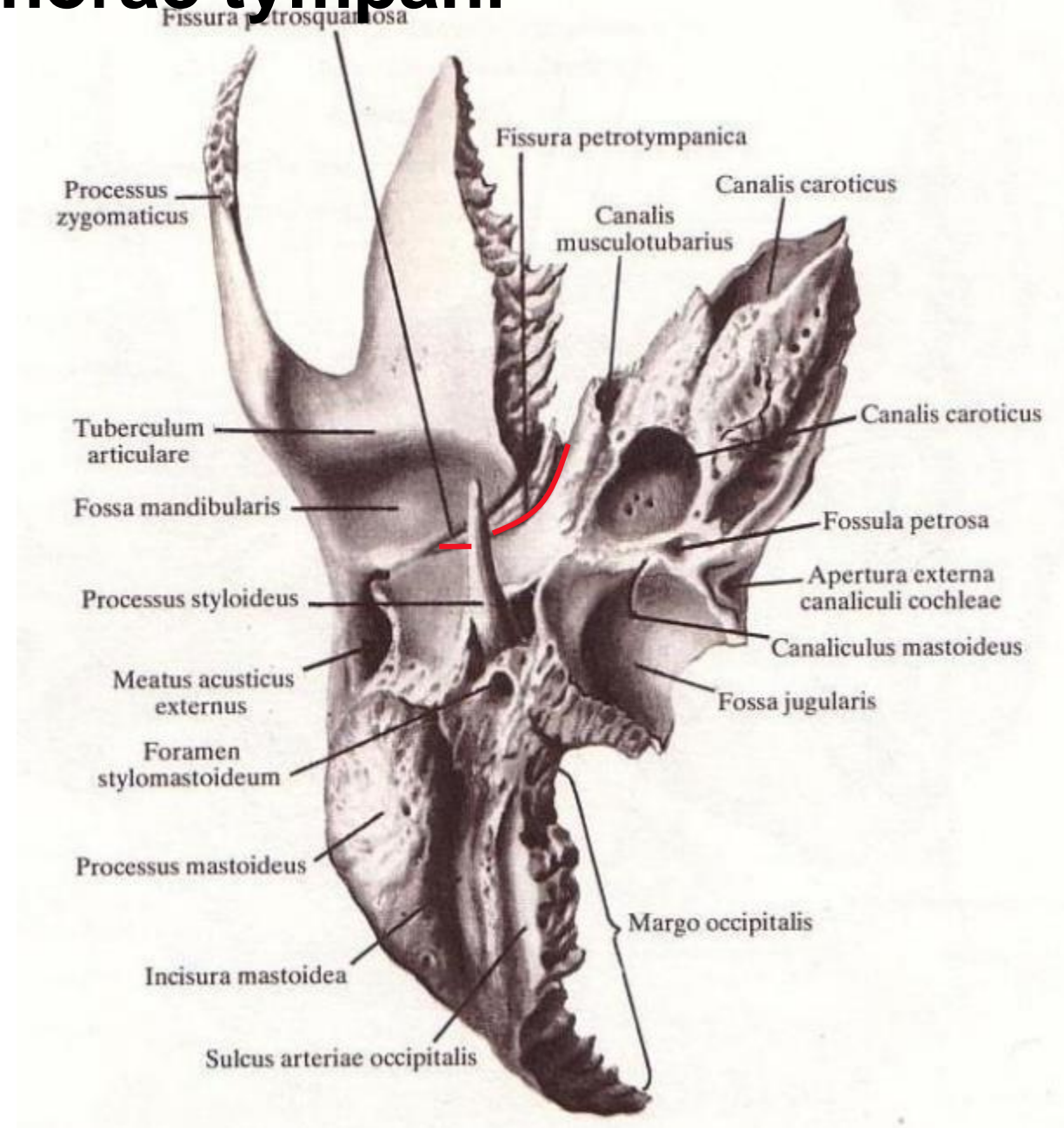
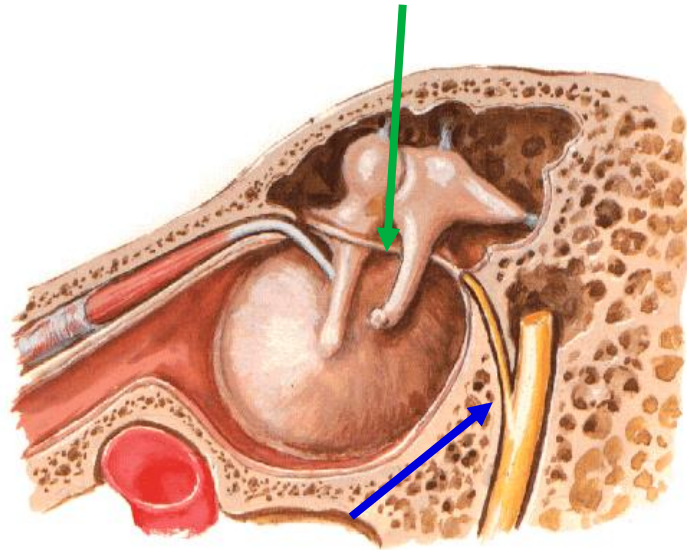
(right, inferior view)



Canaliculus chorae tympani

3rd portion of the facial canal
Tympanic cavity
Fissura petrotympanica

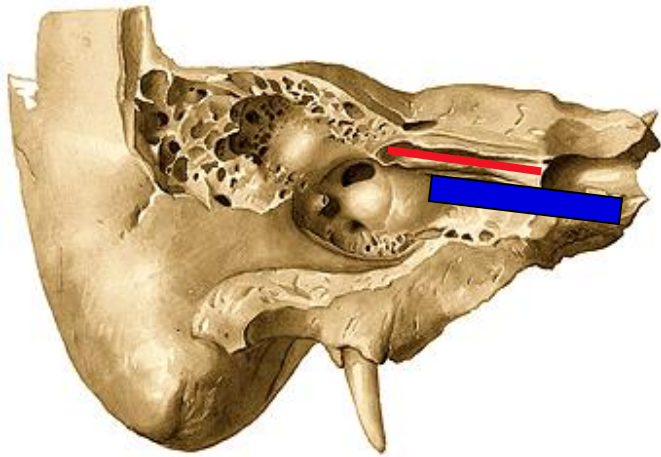
(right, posterior view)



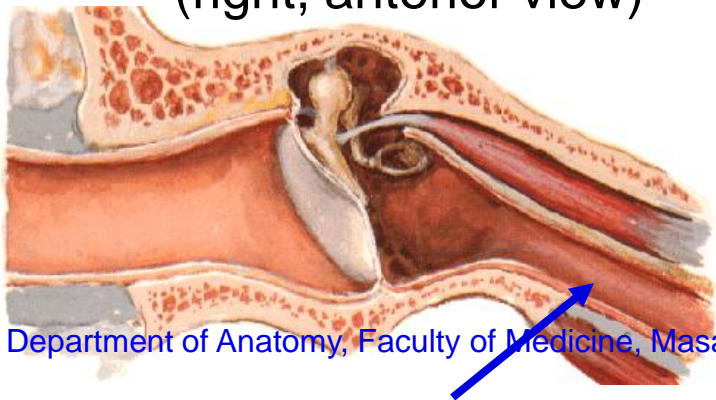
Canalis musculotubarius

- Semicanalis muscoli tensoris tympani
- Semicanalis tubae auditivae
- Apertura externa canalis musculotubarii

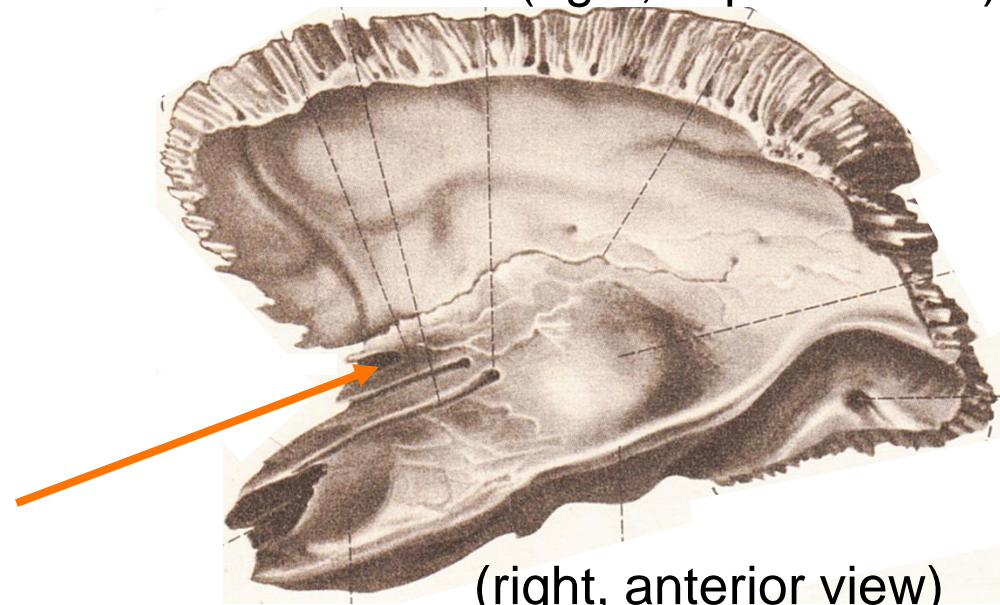
(right, anterolateral view)



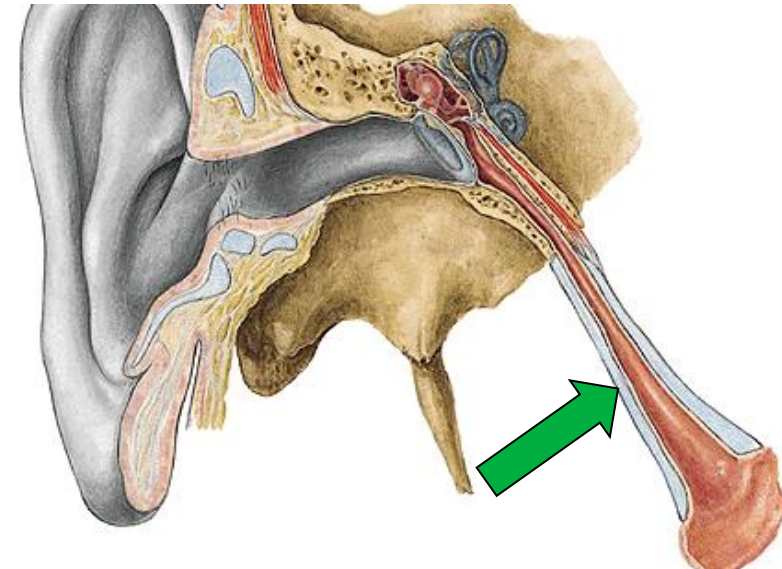
(right, anterior view)



(right, superior view)



(right, anterior view)

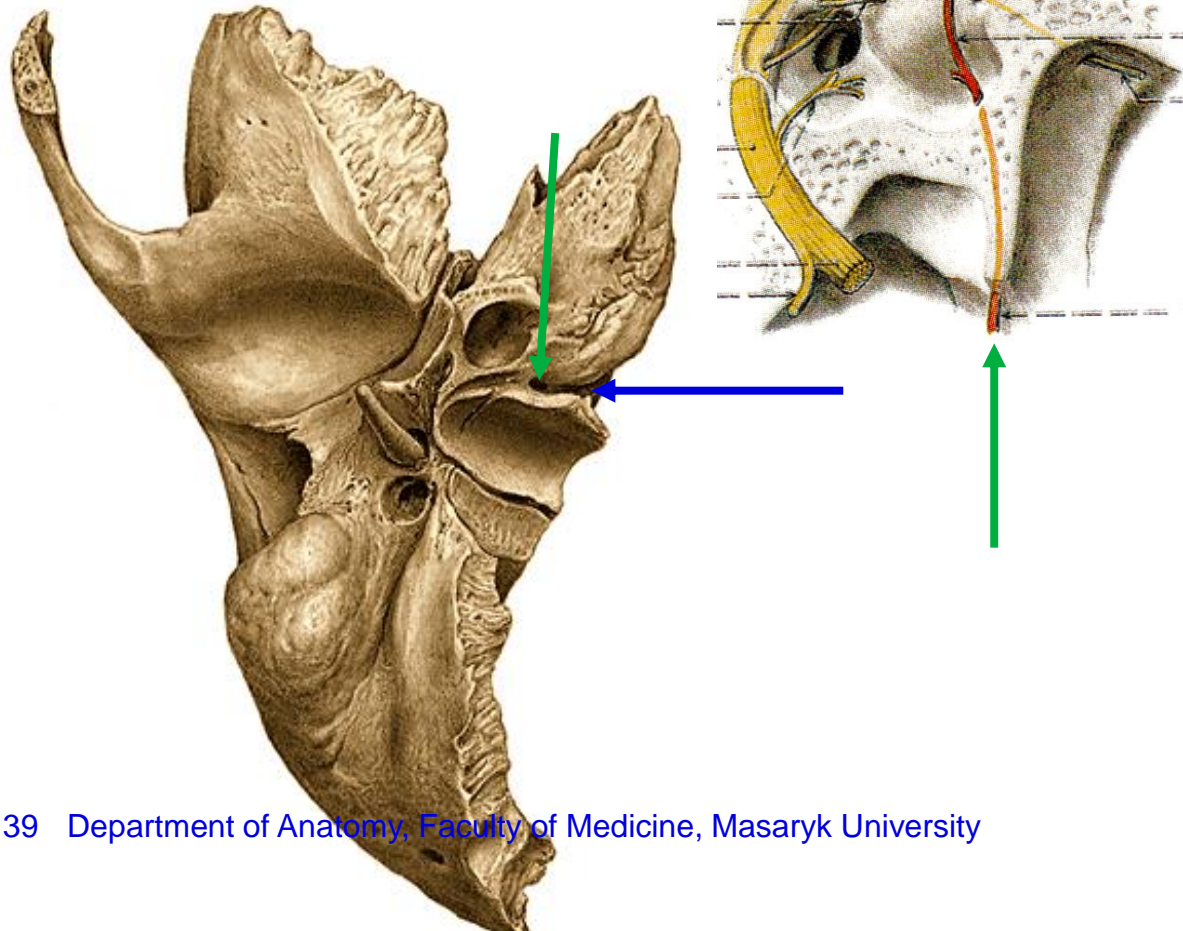


Canaliculus tympanicus

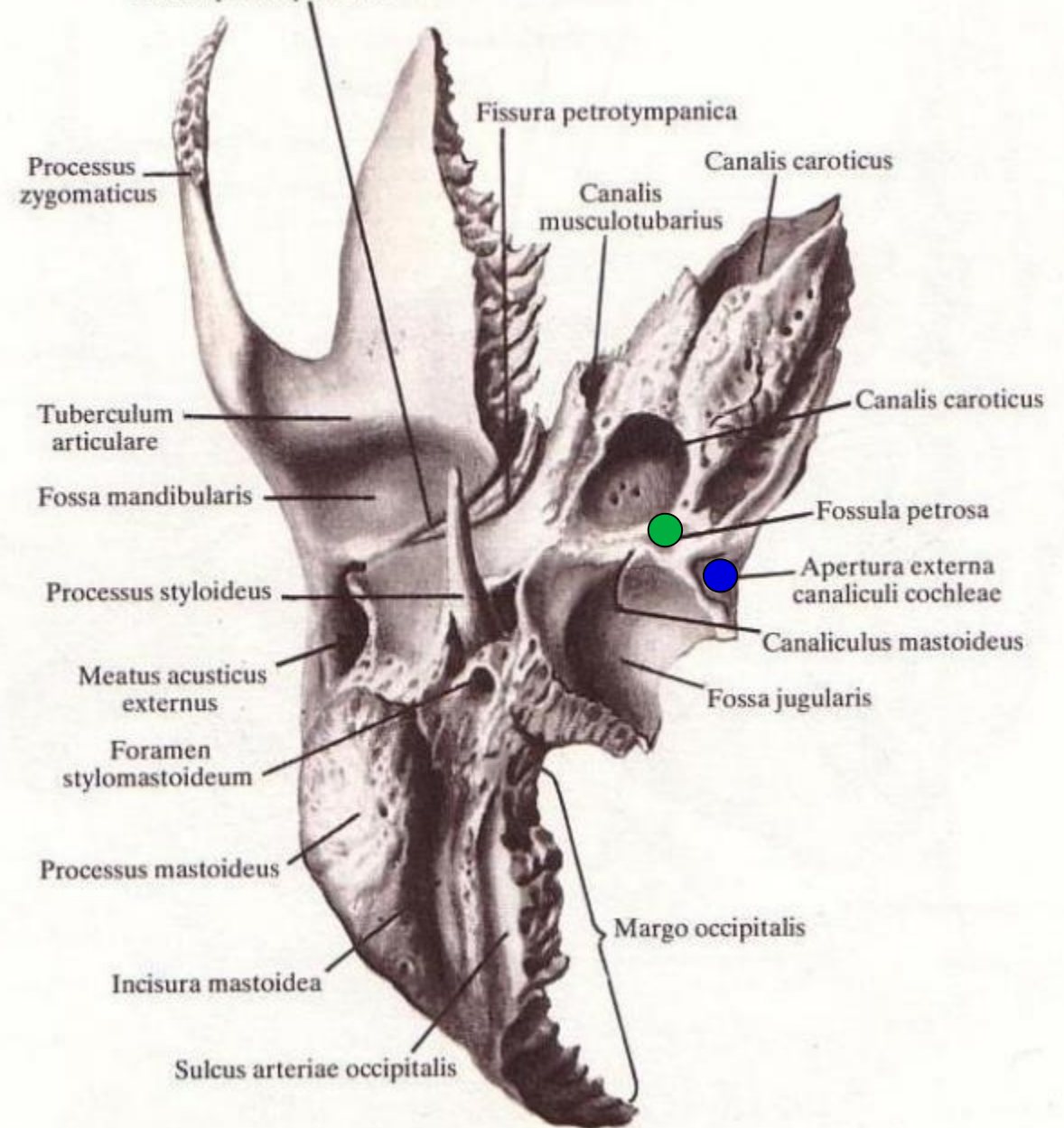
Apertura externa canaliculi tympanici

Fossula petrosa

(right, inferior view)



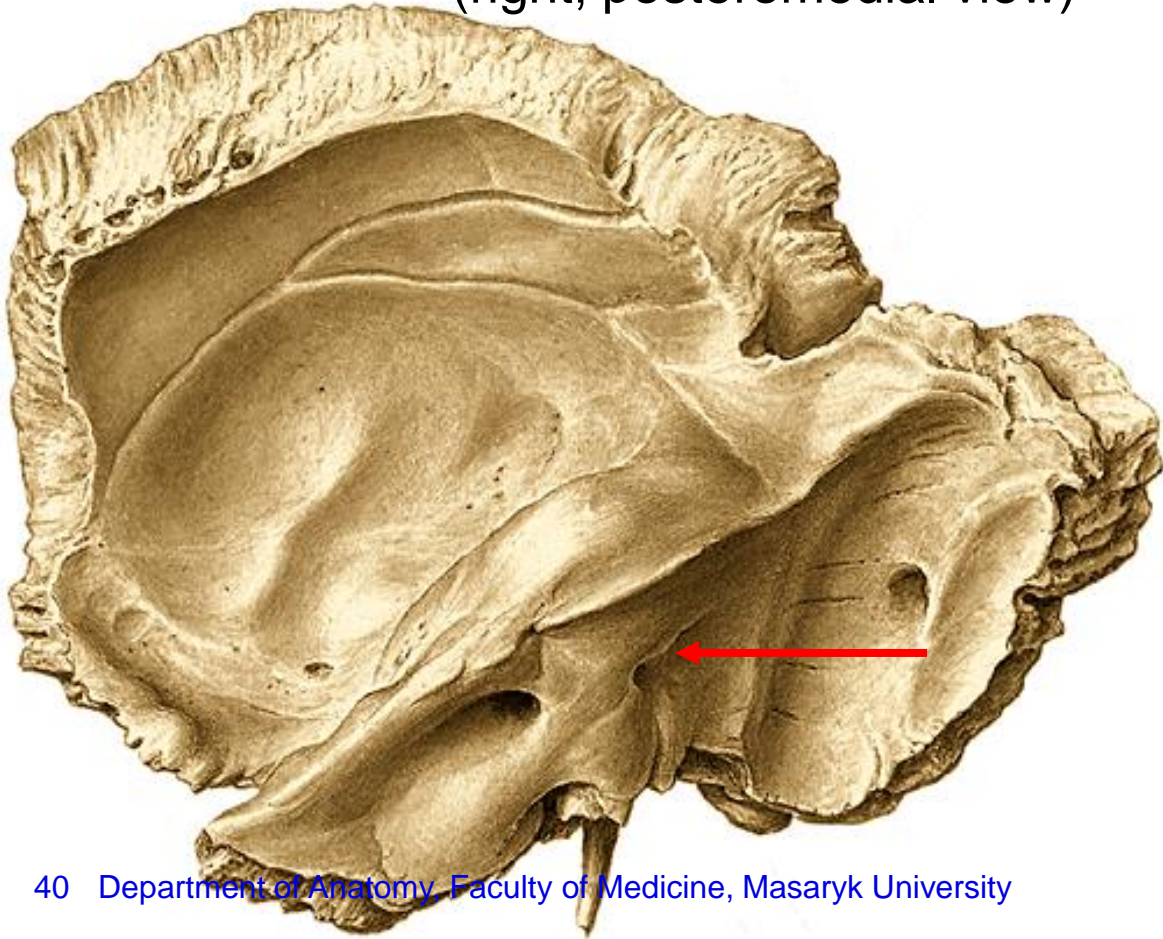
Canaliculus cochleae



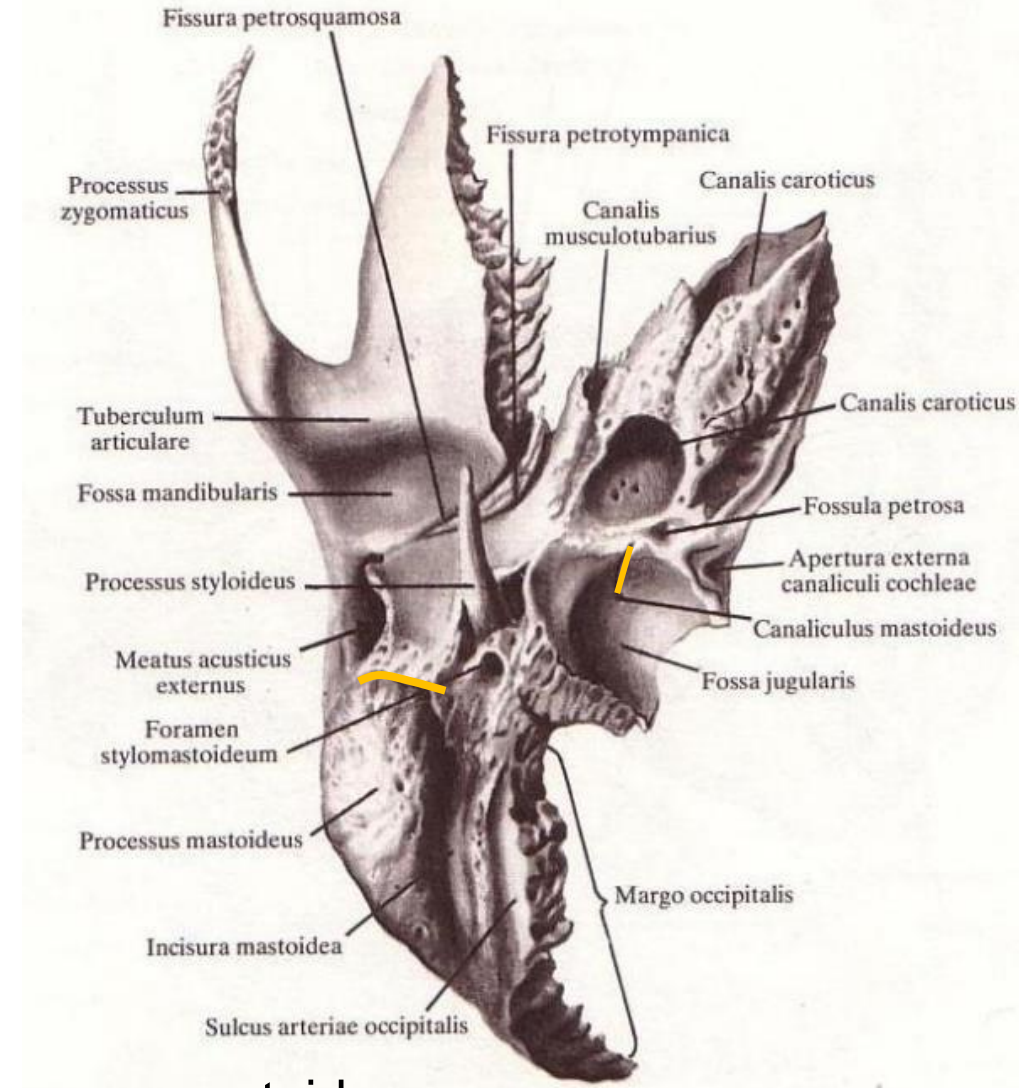
Canaliculus (aquaeductus) vestibuli

Apertura externa aquaeductus vestibuli

(right, posteromedial view)



Canaliculus mastoideus



Fissura tympanomastoidea

- apertura externa canaliculi mastoidei



The pictures used in this lecture were taken from following sources:

- **Atlas der Anatomie des Menschen/Sobotta. Putz,R., und Pabst,R. 20. Auflage. München:Urban & Schwarzenberg, 1993**
- **Netter: Interactive Atlas of Human Anatomy.**
- **Naňka, Elišková: Přehled anatomie. Galén, Praha 2009.**
- **Čihák: Anatomie I, II, III.**
- **Drake et al: Gray´s Anatomy for Students. 2010**
- **Sinelnikov: Atlas of Human Anatomy Vol I Moscow 1963**