ANATOMY OF ORBIT

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Development of orbit

Develops from mesenchyme by ossification

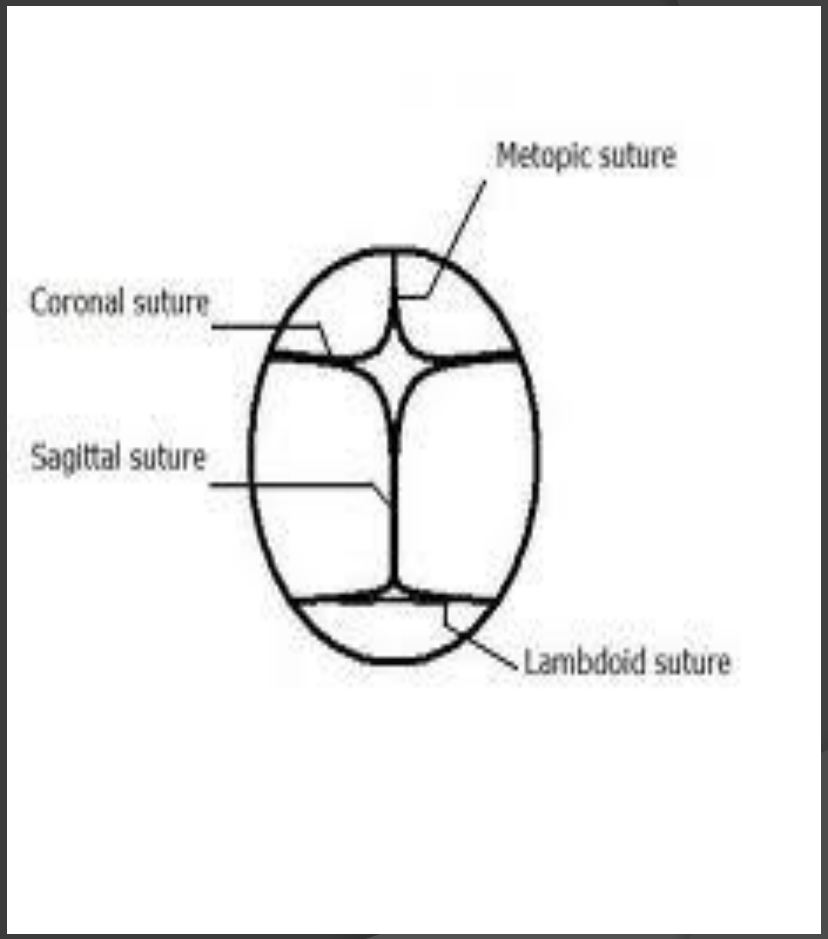
6 th to 7 th week laying down of bones starting with maxilla bone around the Optic vesicle

During this time optic vesicle 170 degree apart rotates anteriorly

Developmental Anomalies :

- Craniosynosotosis:

Brachycephaly
Oxycephaly
Scophocephaly
Trigonocephaly

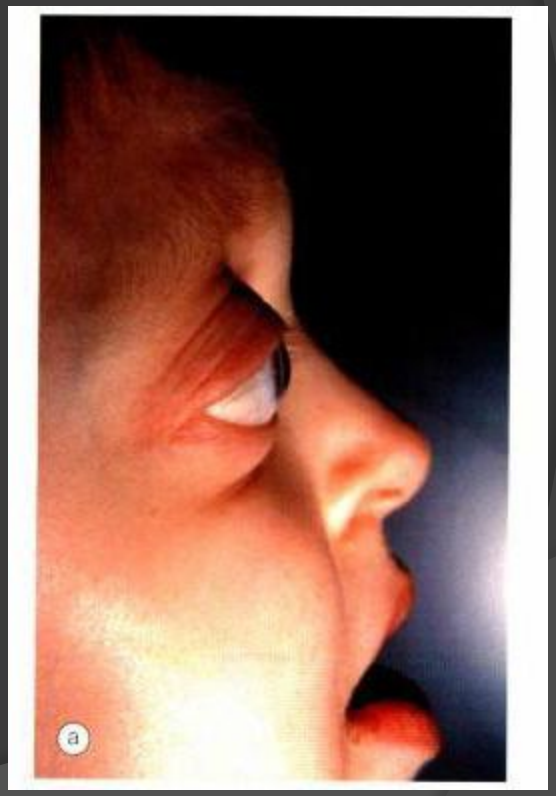


Craniosfacial dysostois / Crouzon' syndrome

Proptosis – shallow orbits

Hypertelorim - wide separation of orbits

V pattern exotropia

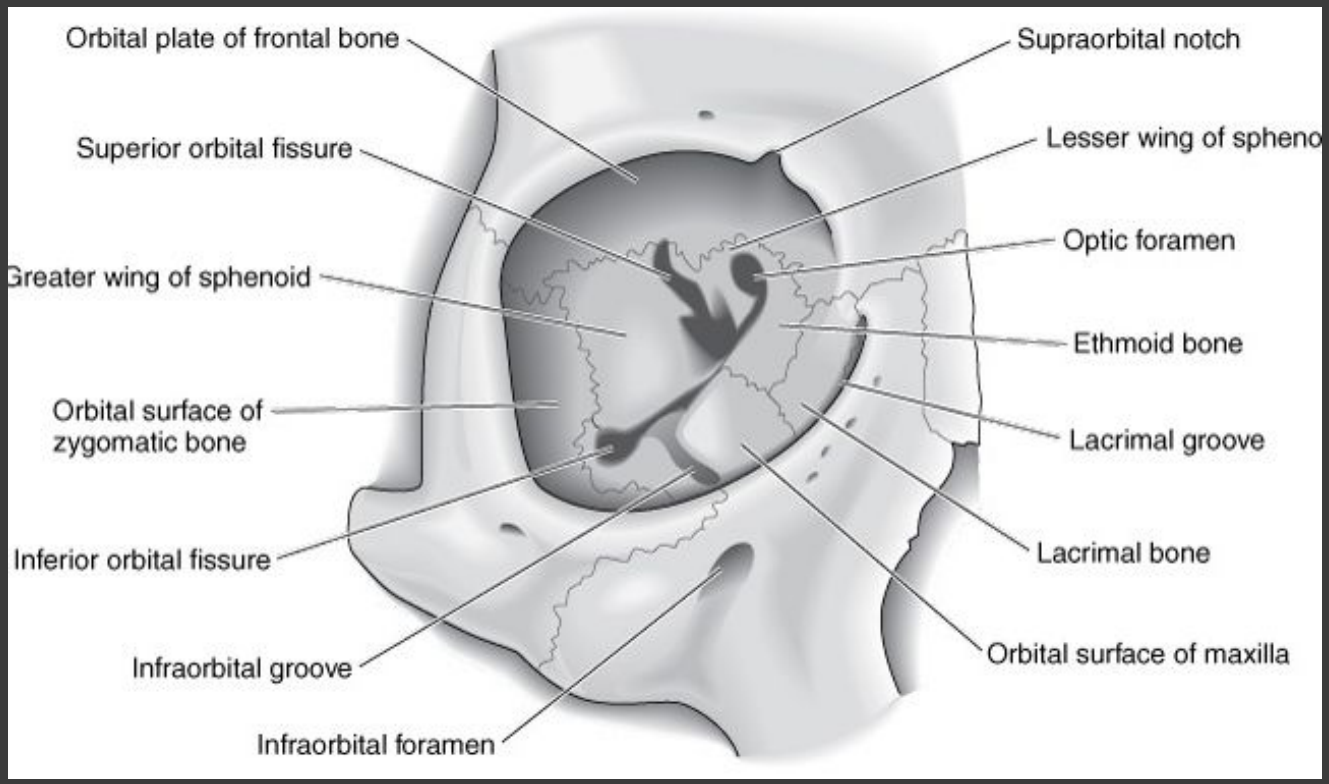


Oxycephaly-syndactlye / Apert' syndrome:

Flattened occiput , steep forehead , supra orbital ridge

Midfacial hypoplasia , parrot beak nose

Bones of Orbit



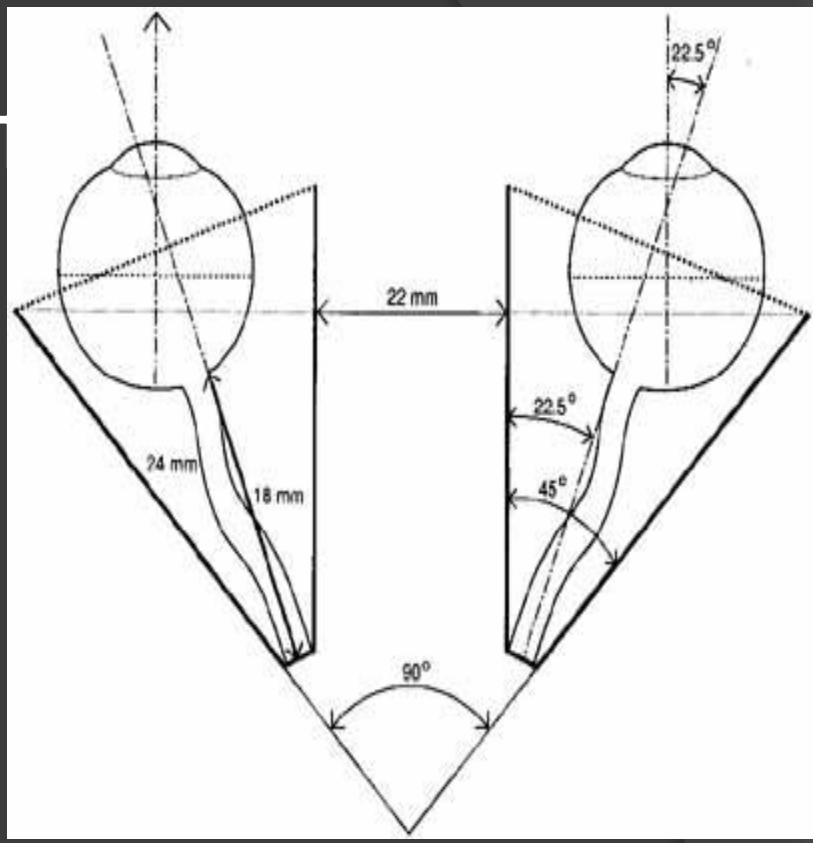
Frontal
Lacrimal
Maxillary

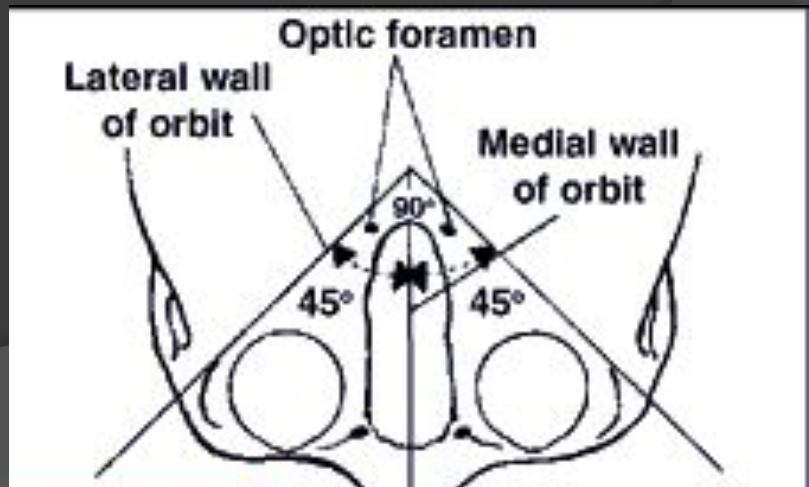
Ethmoid
Palatine
Zygomatic

Sphenoid

Dimensions - orbit

- 30 ml –volume
- 35 mm vertically ,
  40 mm horizontally
- 45 degree between lateral and sagital plane
- 23 degree between visual and orbital axis





Boundaries of Orbit

- Roof
- Floor
- Side walls
- Orbital apex

- Roof of orbit

Frontal bone [Orbital plate] & lesser wing of sphenoid

Separated from frontal sinus and anterior cranial fossa above

Lacrimal gland fossa and trochlear fossa behind orbital rim

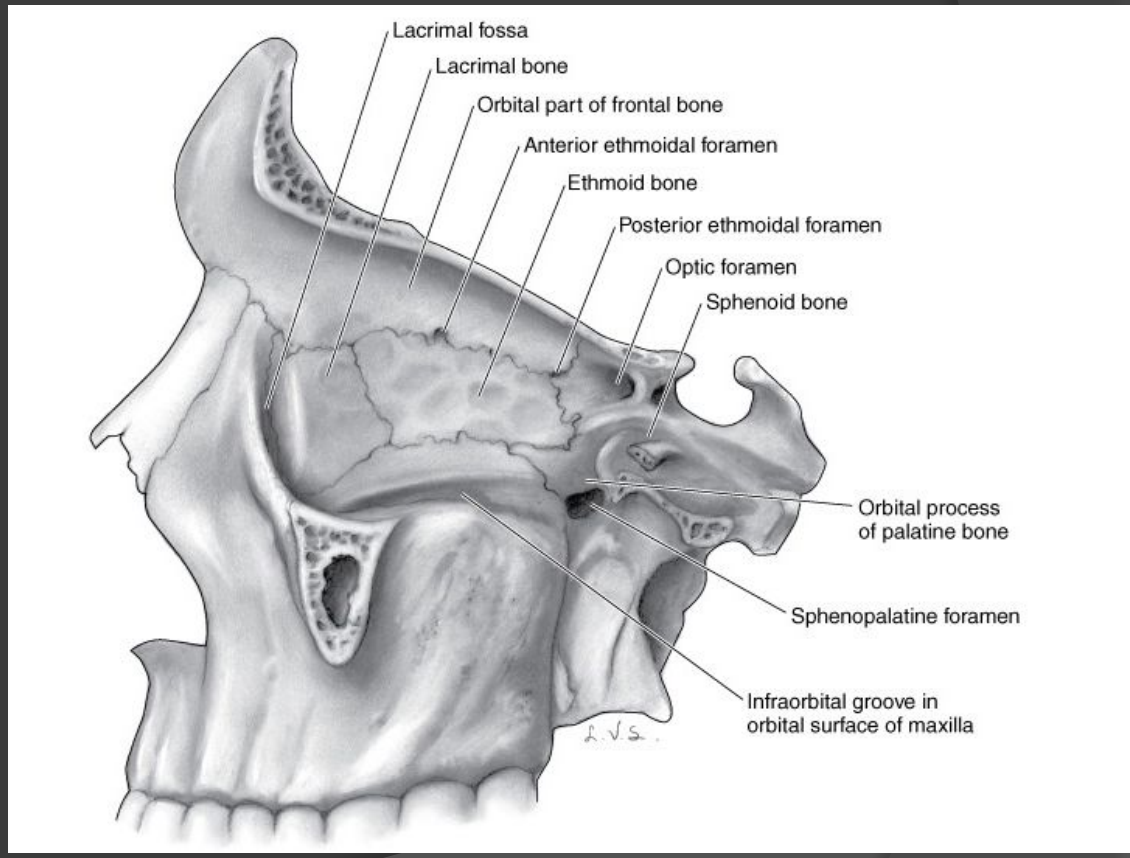
- Orbital roof anomaly / fracture

CSF pulsation → pulsatile exophthalmos

Orbital meningocele / encephalocele

- Medial wall

Body of sphenoid
Ethmoid
Lacrimal
Maxilla[frontal process]



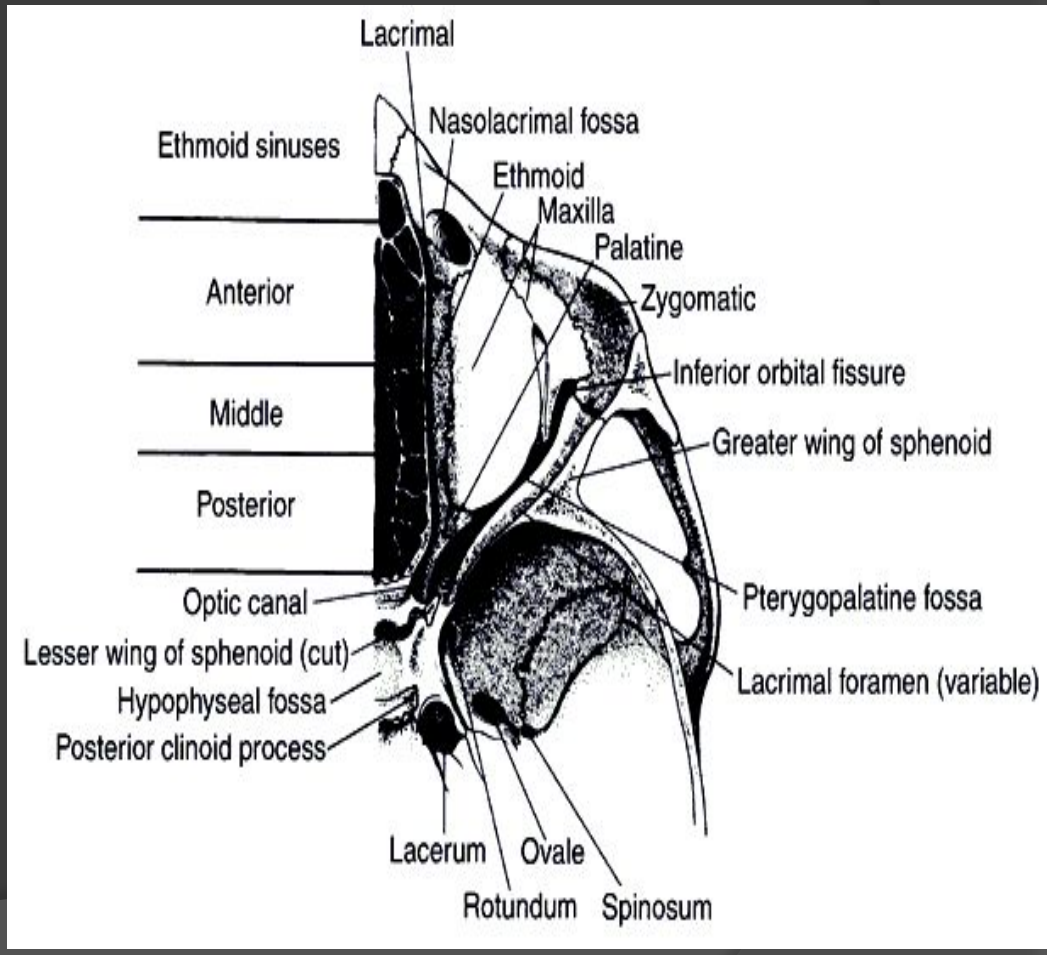
- Orbital cellulitis

Extremely thin wall
Prone for damage & sinusitis spread
Infection across → Orbital cellulitis

- Floor of orbit

Maxilla
Zygomatic
Palatine

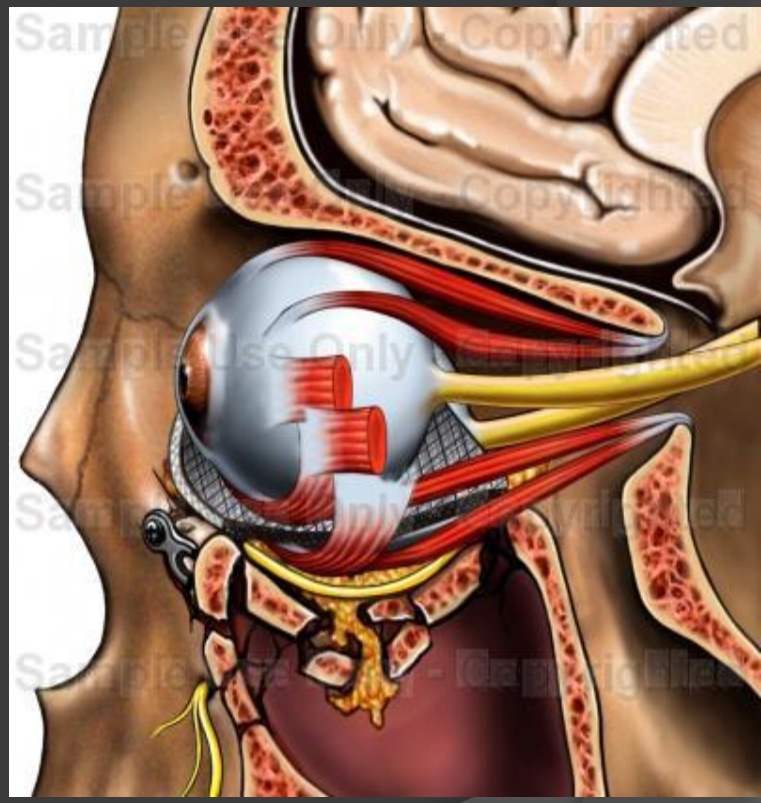
Triangular segment
-- thinnest
Inferior orbital groove



- Blow out fractures

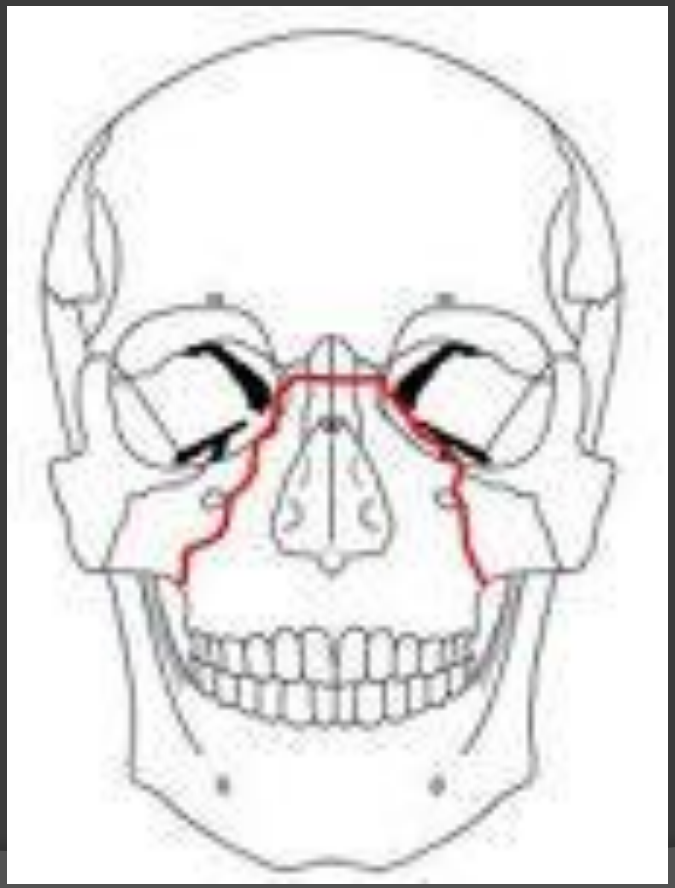
Fragile barrier to maxillary sinus

Due to trauma eyeball collapse into Maxillary sinus

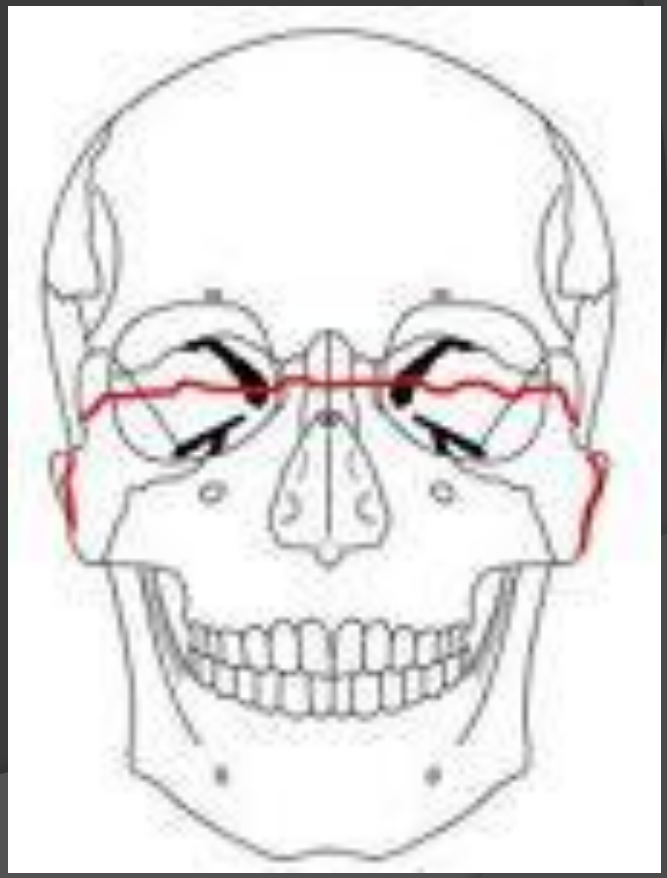


Le fort's fracture

Type 2 - Pyramidal



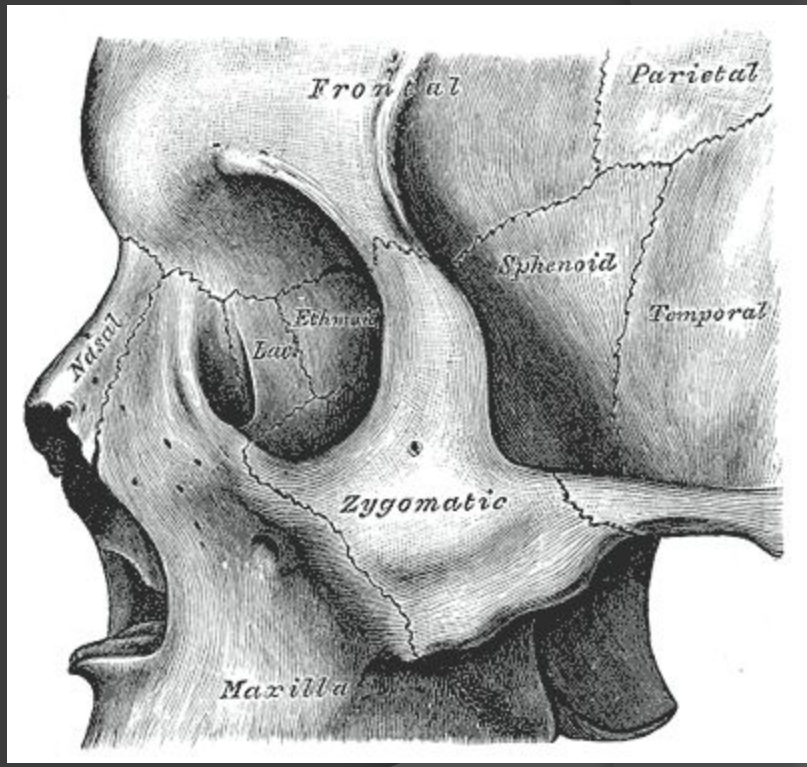
Type 3 - Craniofacial dissociation



- Lateral wall

Greater wing –sphenoid
Orbital surface –
Frontal process of zygomatic

Inferiorly – inf orbital fissure
Medially – sup orbital fissure



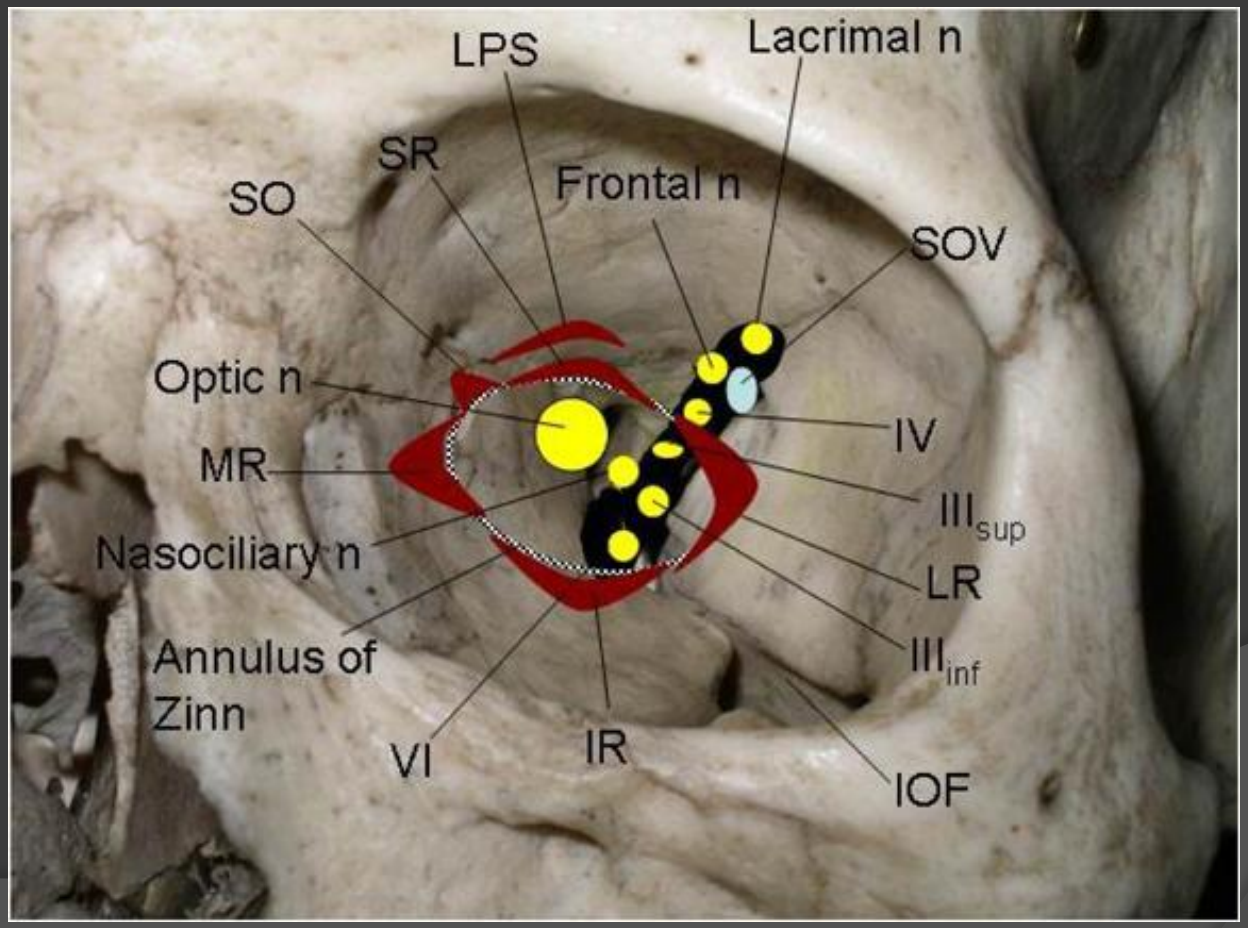
- Behind Zygomatic sphenoidal suture lateral orbitotomy of greater wing (thin wall) → cancellous bone
  middle cranial fossa
  dura matter

- At frontal sphenoidal suture
  -- meningeal foramen

  Site of anastomosis of Lacrimal artery and meningeal artery collaterals

  Periosteal elevation at this site → Brisk bleeding

- Orbital apex



- Orbital apex syndrome / Tolosa - hunt syndrome :

Damage to structures at apex 2 nd, 3 rd, 4 th ,6 th nerves

Symptoms : visual loss, ophthalmoplegia periorbital & facial pain

- Other causes:

a. Inflammatory
b. Infectious
c. Neoplastic
d. Iatrogenic / traumatic
e. Vascular

- Superior orbital fissure syndrome / Rochon – Duvigneaud syndrome :

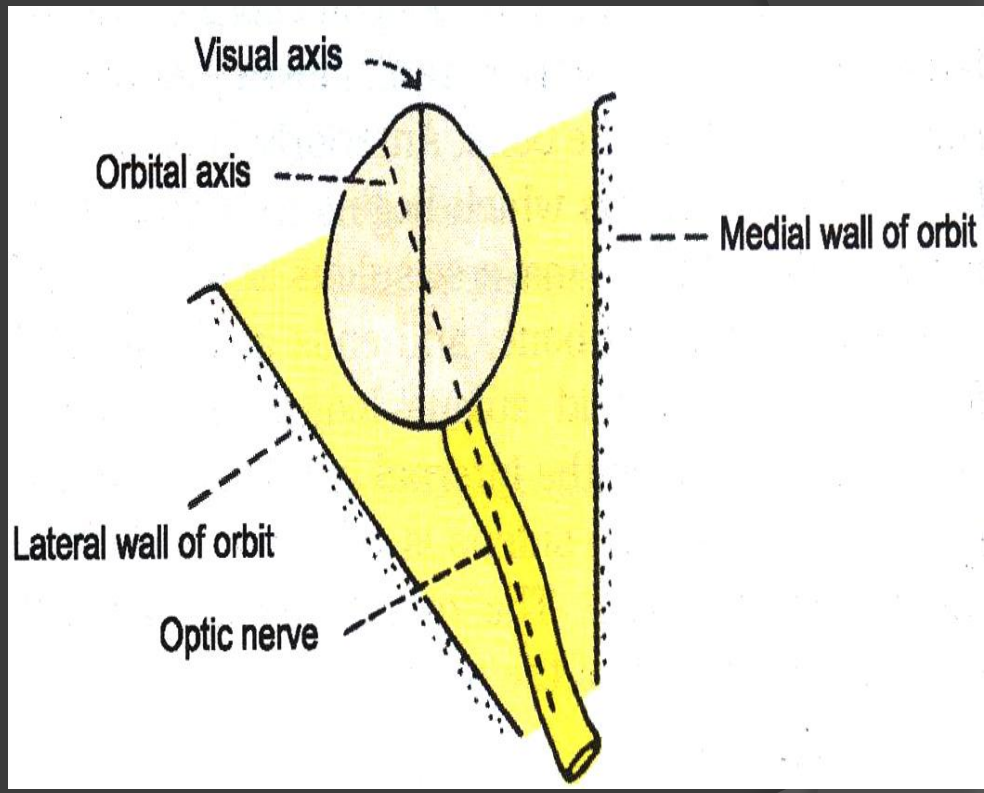
Lesion anterior to orbital apex excluding optic nerve pathology

Contents of orbit

- Eye ball
- Orbital fat
- Connective tissue system
- Blood vessels
- Nerves
- Extraocular muscles

Eyeball - Applied anatomy:

- Proptosis :
- Dystopia
- Enophthalmosis
- Ophthalmoplegia



Connective tissue system

- Periorbita
- Orbital septum
- Tenon's capsule

- Periorbita:

Loosely attached to orbital bone
Attached firmly to

a. Arcus marginalis
b. Trochlea
c. Lateral orbital tubercle
d. Optic foramen
e. Orbital fissures
f. Dura and optic canal margins

- Orbital septum:

  Interconnecting / circumferential radial webs of fascial system

  support and transmit forces in trauma

  Compressive optic neuropathy following trauma

- Anterior fascial system

Formed by condensation of fibrous septa

→ Lockwood lig,
whitnall sup susp lig
Lacrimal lig
Intermuscular septum

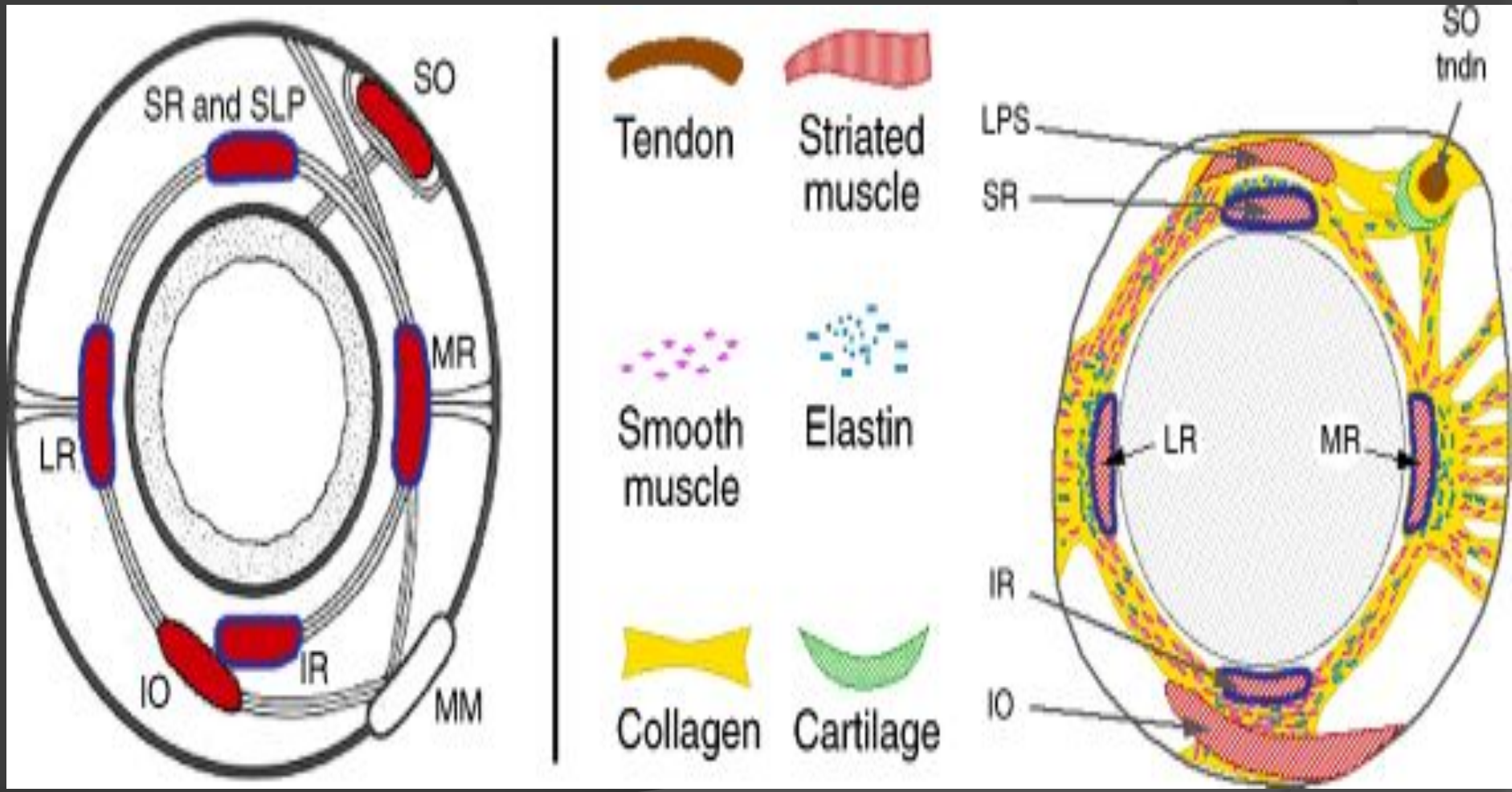
Posterior Fascial system → Incompletely formed

- Tenon's capsule

Dense elastic , vascular

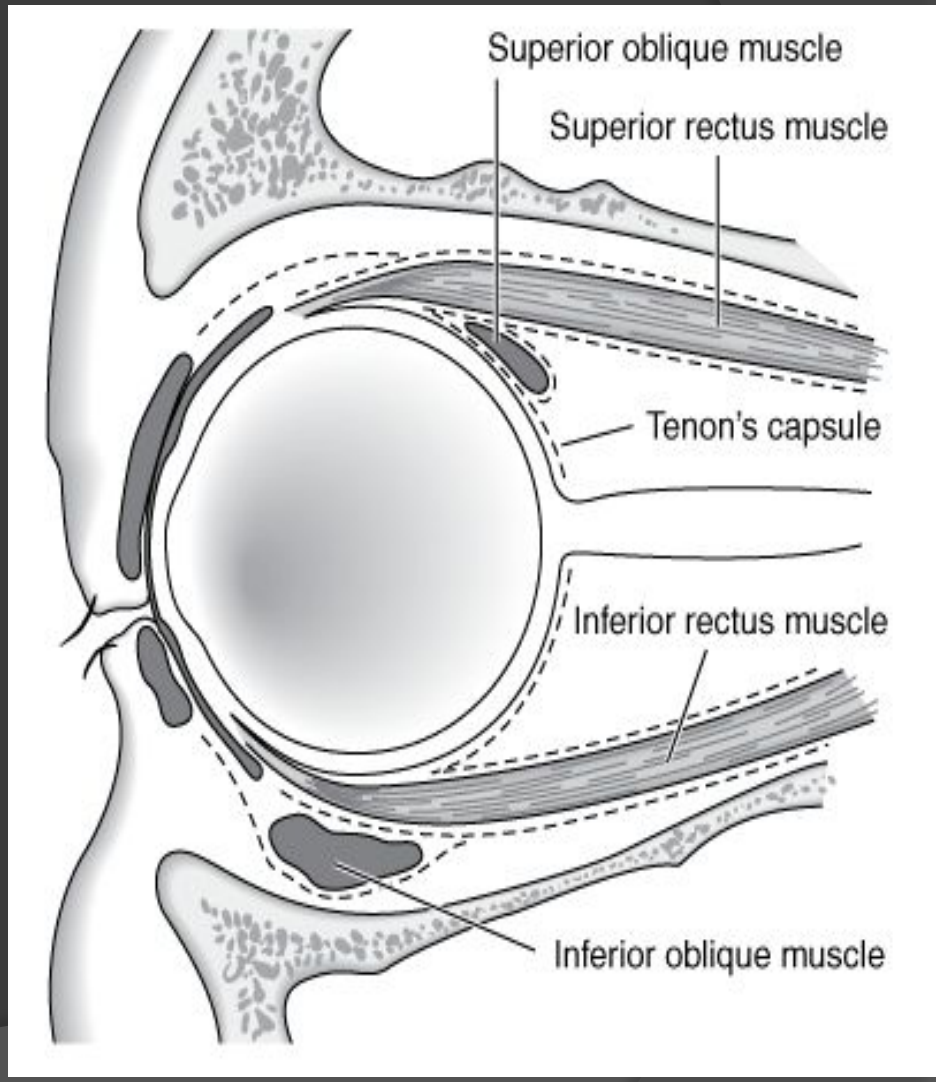
Extent : from perilimbal sclera to optic nerve meninges with bursa within

Sleeve like extensions for extra ocular muscles continues as fibrous capsule along its length


SR and SLP
SO
MR
LR
IO
IR
MM
Tendon
Striated muscle
Smooth muscle
Elastin
Collagen
Cartilage
SO tndn
LPS
SR
LR
MR
IR
IO

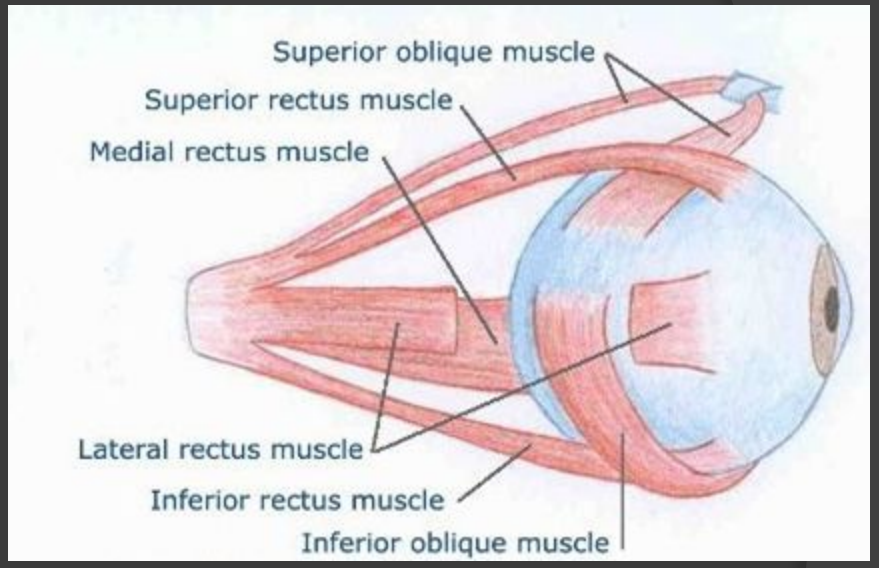
Surgical spaces in orbit :

- Sub periosteal space
- Peripheral space
- Central space
- Tenon's space



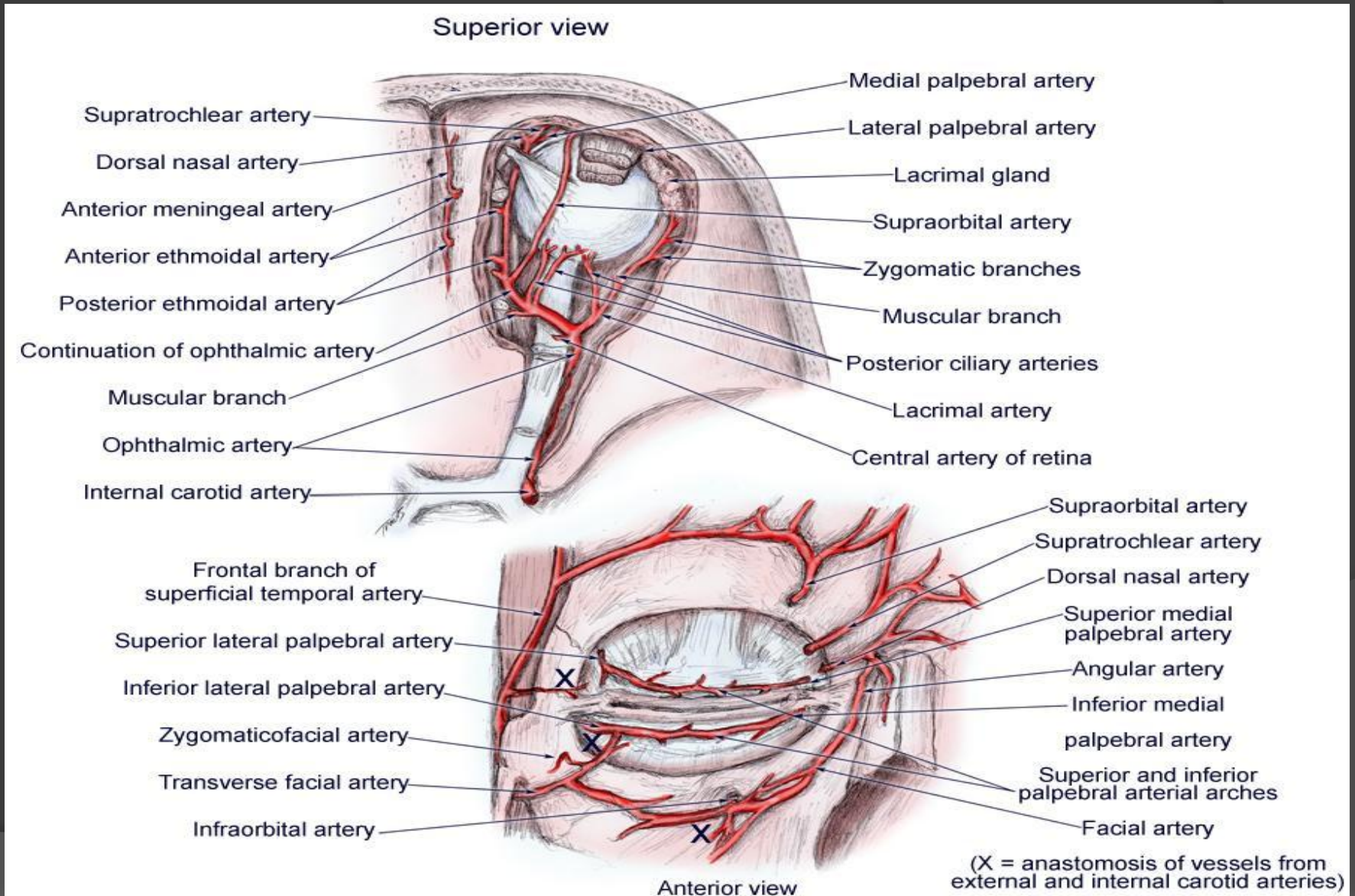
Extra ocular muscles

- 4 rectal muscles
- 2 oblique muscles
- Two lid retractors

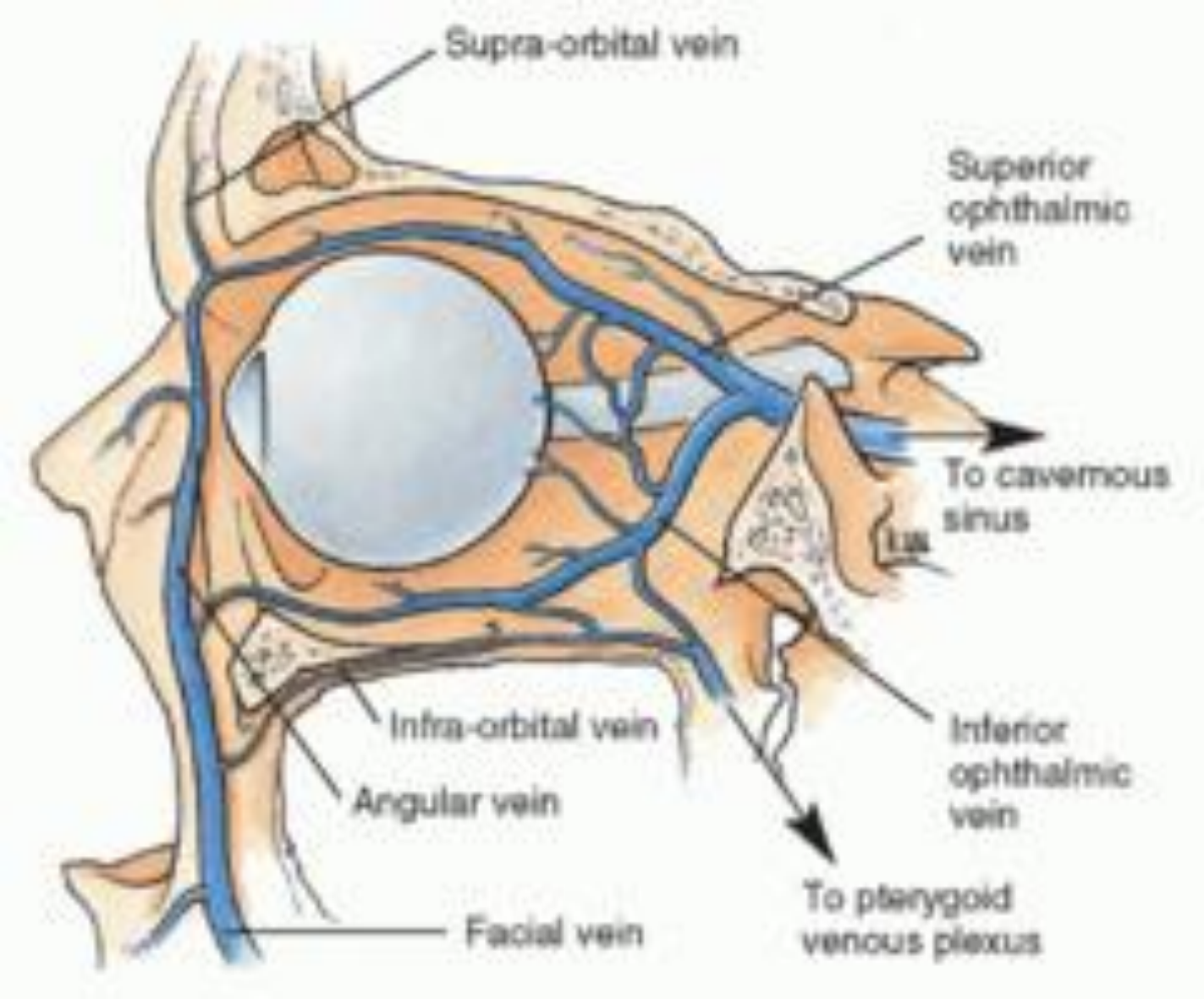


To serve in eyeball movements in the orbital cavity

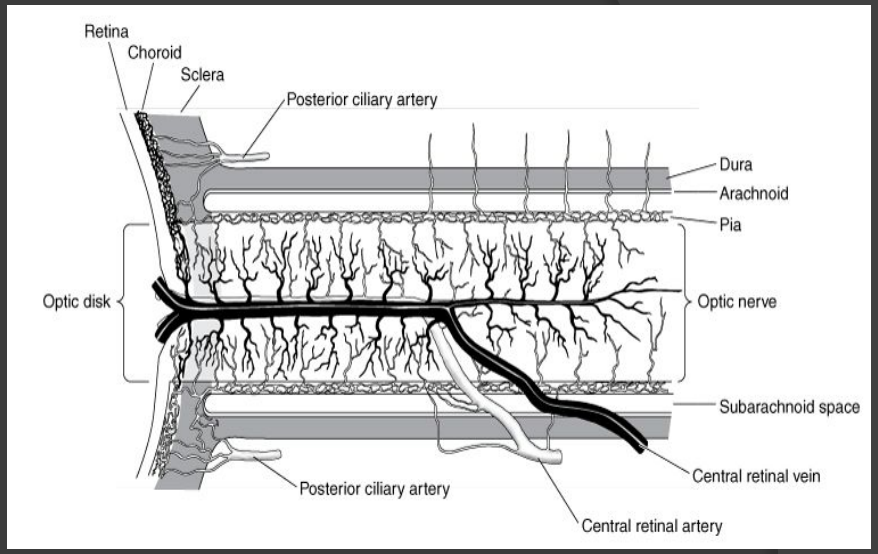
Arterial supply



Venous drainage



Optic nerve



Intra orbital part = 25 mm out of 4 cm

Enclosed in three meningeal sheaths

At apex surrounded by recti muscles ,
Central retinal artery and vein pierces optic nerve 1.25 cm behind optic nerve

Relations: superiorly → ophthalmic artery
sup ophthal vein
nasociliary nerve

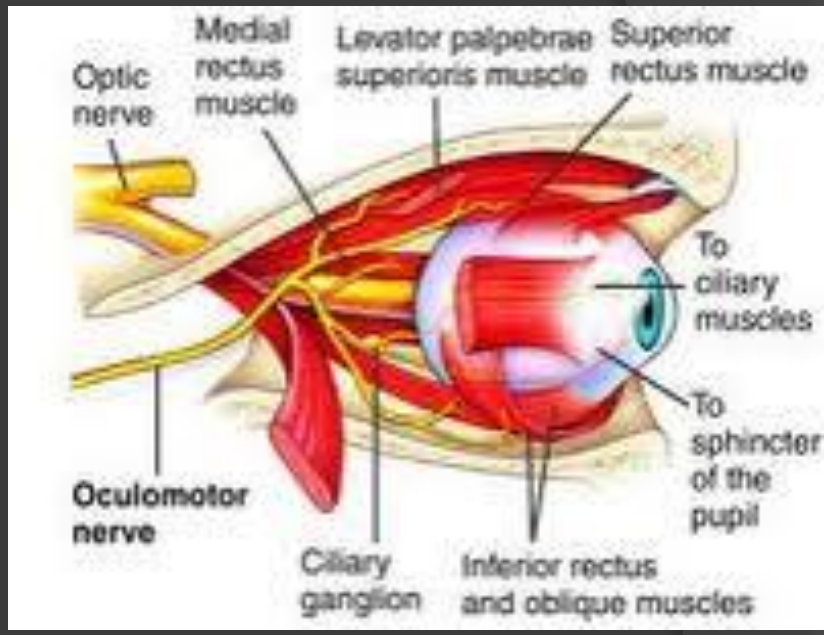
inferiorly → nerve to medial rectus

Oculomotor nerve

Divides at anterior part of cavernous sinus before Entering sup orbital fissure

Sup division → Sup rectus
LPS

Inf division → Medial rectus
Inf rectus
Inf oblique

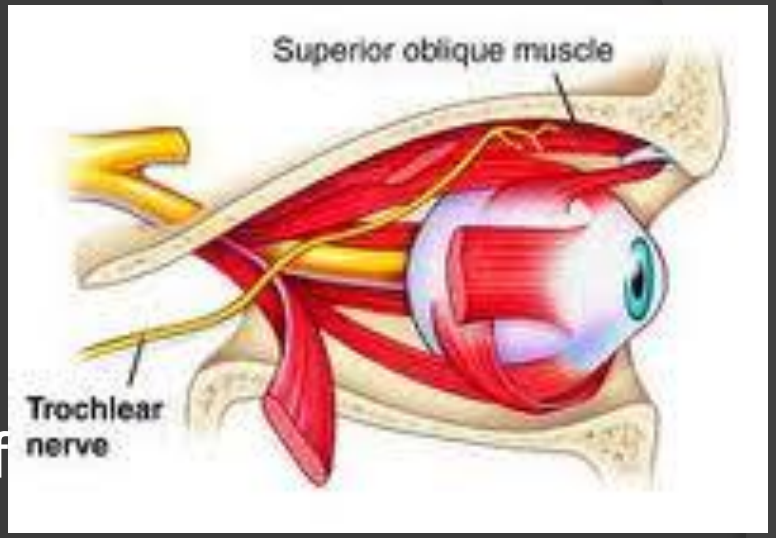


And motor root relay at ciliary ganglion → sphincter pupillae , ciliary muscle

Trochlear nerve

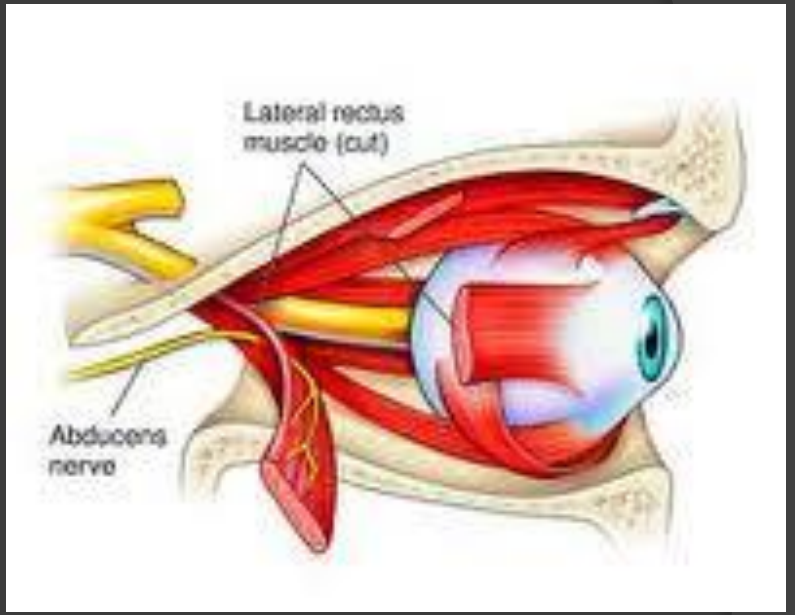
Runs medially from lateral wall of cavernous sinus

Above Levator palpebral sup
Then supplies orbital surface of Superior oblique



Abducent nerve

Running inferior lateral to 3 rd nerve then supplies ocular surface of lateral Rectus



Trigeminal nerve

- Three terminal branches of ophthalmic division:

I. Frontal nerve → supratrochlear
supraorbital

I. Lacrimal nerve → Sensory and secretomotor fibres to lacrimal gland tru zygomaticotemporal nerve

- Nasociliary nerve:

1. Communicating branch to sensory root of ciliary ganglion
2. Long ciliary nerves - dilator pupillae
3. Posterior and anterior ethmoidal branches
4. Infratrochlear nerve

THANK YOU