



## ANATOMY OF ORBIT

### ➤ Bony Orbit is Made by 7 Bones: -

- 1) **M**axilla    2) **L**acrimal    3) **E**thmoid    4) **S**phenoid    5) Zygomatic    6) Frontal    7) Palatine

### Boundaries of bony orbit

Apex	Roof	Floor	Lateral	Medial
<ul style="list-style-type: none"> <li>Optic canal:               <ul style="list-style-type: none"> <li>Made of sphenoid bone</li> <li>Contain optic nerve</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Orbital Plate of Frontal Bone</li> <li>Lesser Wing of The Sphenoid</li> </ul>	<ul style="list-style-type: none"> <li>Maxilla</li> <li>Zygomatic bone</li> <li>Palatine bone</li> <li>The only wall <b>does-not-contain sphenoid</b></li> </ul>	<ul style="list-style-type: none"> <li>Zygomatic</li> <li>Greater wing of sphenoid.</li> </ul>	<b>My Little Eye Sits in Orbit</b> <ul style="list-style-type: none"> <li>Maxilla</li> <li>Lacrimal bone</li> <li>Ethmoid</li> <li>Body of Sphenoid</li> </ul>

### Contents of bony orbit

- |   |   |
|---|---|
| 1) Eyeball<br>2) Fasciae: Orbital, Bulbar (Tenon's Fascia)<br>3) Extraocular muscles: <ul style="list-style-type: none"> <li>✓ Levator Palpebrae Superioris,</li> <li>✓ 4 Recti muscles: Superior, Inferior, Lateral and Medial Rectus</li> <li>✓ Superior and Inferior Oblique Muscles</li> </ul> 4) Nerves: cranial nerves II, III, IV, VI and V1" ophthalmic"<br>5) Blood vessels<br>6) Suspensory ligament of the eyeball | 7) Conjunctiva<br>8) Trochlea of superior oblique<br>9) Orbital septum<br>10) Ciliary ganglion and short ciliary nerves<br>11) Extraocular Fat<br>12) Lacrimal gland, Lacrimal sac & Nasolacrimal duct<br>13) Eyelids<br>14) Medial palpebral ligament and Lateral palpebral ligament<br>15) Medial and Lateral Check ligaments |
|---|---|

### Foramina of bony orbit

- |  |  |
|--|--|
| 1) Optic canal" II"<br>2) Superior orbital fissure" III, IV, VI, V1"<br>3) Inferior orbital fissure<br>4) Anterior ethmoidal foramen<br>5) Posterior ethmoidal foramen | 6) Infraorbital foramen<br>7) Supraorbital foramen<br>8) Naso-lacrimal canal opening<br>9) Zygomatic orbital foramen |
|--|--|

### Muscles of the orbit (Extra-ocular Muscles)

Muscles	Recti muscles				Oblique muscles		Levator Palpebrae Superioris
	SR	IR	MR	LR	SO	IO	
Origin	Annulus of Zinn				Annulus of Zinn	Maxilla	--
Insertion	Sclera				Sclera		--
Nerve supply	All are supplied by Oculomotor n. <b>except lateral Rectus</b> (Abducent n).				SO4	3	3
	3		LR6				
Action	Elevate eye Adduct eye	Depress eye	Adduct eye	Abduct eye	Depress eye "نزول السلم"	Elevate eye	Raises the eyelid
Lesion	Lateral squint				Medial Squint		Ptosis
Exophthalmos → protrusion of eyeball    جحوظ العين							

### Vessels of the orbit "Ophthalmic vessels"

	Ophthalmic Artery	Ophthalmic Veins
Origin	Internal carotid artery	
Termination	Supratrochlear & dorsal nasal	
Branches	1) Lacrimal 2) Frontal 3) Central artery of the retina "enters optic nerve" 4) Zygomatic 5) Glandular 6) Supraorbital 7) Supratrochlear (terminal) 8) Dorsal nasal (terminal)	1) Superior Ophthalmic V "connected with Anterior Facial Vein" 2) Inferior Ophthalmic V "connected with pterygoid venous plexus"

### Nerves of the orbit

Motor nerves	Sensory nerves	Para-sympathetic ganglion [autonomic nerve]
All MS are supplied by 3 <sup>rd</sup> <b>except LR6&amp; SO4</b> 3 <sup>rd</sup> → (principal)	1) <b>General sense:</b> - Ophthalmic division of trigeminal (V1) 2) <b>Special (vision):</b> - Optic nerve	1) <b>Ciliary ganglion:</b> - sphincter & ciliary muscles. 2) <b>S.P.G:</b> - Lacrimal gland

### Lacrimal Apparatus

- Lacrimal Gland:**
  - Paired **almond-shaped glands**, one for each eye, that secrete the **aqueous layer** of the tear film.
  - They are situated in the **upper, outer portion** of each orbit, in the **lacrimal fossa** of the orbit formed by the **frontal bone**
  - Formed of 2Parts:
    - The orbital portion
    - The smaller palpebral portion

**Tears Pathway**    ▪ **Tears secreted collect in:**  
 - Fornix (conjunctiva of the upper lid) → Lacrimal puncta → Lacrimal sac → Nasolacrimal duct

**Nerve supply of lacrimal Gland**    ▪ **Parasympathetic** by **Facial nerve** through **lacrimal branch of ophthalmic nerve**



## STRUCTURE OF THE EYEBALL

### External structures of the eye

#### ➔ Conjunctiva:

- The lining on the underside of each eyelid and the mucous membrane over the eyeball, providing a protective covering for the exposed surface

### Coats of the eye

The outer protective inelastic coat	The middle vascular coat "uveal tract"	The inner nervous coat									
<p>1) <b>Cornea:</b></p> <ul style="list-style-type: none"> <li>- Transparent outer surface. (clear lens in front of eye)</li> </ul> <p>2) <b>Sclera:</b></p> <ul style="list-style-type: none"> <li>- Opaque</li> <li>- The white of the eye.</li> </ul>	<p>1) <b>Iris (colored part)</b></p> <ul style="list-style-type: none"> <li>- Colored part of eye</li> <li>- controls light entering the eye</li> <li>- <b>Pupil</b> (black hole) <ul style="list-style-type: none"> <li>○ Black hole in iris</li> <li>○ Where light enters</li> <li>○ <b>Gets larger in dark places</b> → allowing more light to enter the eye</li> <li>○ <b>Gets smaller in light places</b> → allowing less light to enter eye</li> </ul> </li> </ul> <p>2) <b>Ciliary body</b></p> <p>3) <b>Choroid</b></p>	<p>✚ <b>Retina:</b></p> <ul style="list-style-type: none"> <li>- Full of photoreceptive cells called rods and cones.</li> </ul> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>SENSITIVE TO</th> <th>Rule</th> </tr> </thead> <tbody> <tr> <td><b>Rods</b></td> <td>Dim light</td> <td>Night Vision.</td> </tr> <tr> <td><b>Cones</b></td> <td>Bright light</td> <td>Color Vision.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>- Nerve fibers from the retina all converge to form the optic nerve at a spot-on inner layer → <b>optic disc</b>.</li> <li>- The optic nerve goes directly to the vision center of the brain.</li> <li>- There are <del>no rods or cones in the area of the optic disc</del>, so it is insensitive to light - a <b>blind spot</b> is created.</li> </ul>		SENSITIVE TO	Rule	<b>Rods</b>	Dim light	Night Vision.	<b>Cones</b>	Bright light	Color Vision.
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### Lens

- Lies behind pupil
- Crystalline lens is the only structure continuously growing throughout life.
- Changeable refractive media.
- Allows us to see objects near and far

### Optic nerve

- Transmits electrical impulses from retina to the brain
- Brain takes inverted image and flips it so we can see