

## ANATOMY LAB 1

This sheet can be read after the lab handout , it's just a main points plus extra note ☺

**Eye ball consist of THREE main coats or layers , which subdivided to 2 or more sub layer ( also termed as layer! According to what Dr Faraj said):**

**1- Fibrous layer ( coat):** The posterior part of the fibrous coat of the eye ball is the sclera while the anterior part is the cornea and the two parts consist of fibrous connective tissue.

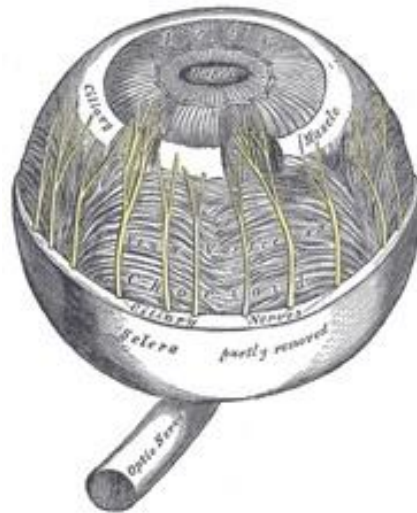
- ✓ Poseriorly, sclera Penetrated by the optic n. ( then it goes to the retina, where the mother cells found ( as Dr said))
- ✓ Corio-sclero junction, where cornea and sclera attached sometimes called Limpus

**2- Vascular and muscular coat:**

Consist of :

**A- Iris:** is a complete disk ( قرص ) not a superior and inferior Appendages ( زوائد ) (see the figure ) , have two muscle Constrictor papillae and dilator papillae:

- ✓ Innervation of Constrictor papillae is parasympathetic and innervation of dilator papillae is sympathetic, so we use sympathomimic drugs or anticholinergic to dilate the pupil
- ✓ Anterior to the iris= ant. champer
- ✓ posterior to the iris= post. champer , and the tow champers communicate throw pupil
- ✓ one of the causes of aqueous humour failing to draine is pupil dilator drugs , so the doctor should be sure that his patient do not have a glaucoma before using this drugs, to prevent him from increasing glaucoma, then blindness



**B- Ciliary muscle:** is a muscular ring called "muscle of accommodation: ability to see near object" , and it also have parasympathetic innervations.

- ✓ Ciliary muscle attached to the lens by suspensory ligament

☒ Mechanism of accommodation :

- ☒ By the contraction of the Ciliary muscle, decreasing in diameter so ligaments relax, so the elastic lens contracts inside and the increase in it thickness and magnification power, make it able see near object.
- ☒ In fact, light entering the eye must gather in the focus ( which is the fovea centralis) any accommodation of light anterior or posterior to the fovea called hyperopia or myopia
- ☒ On the other side, the relaxation of the Ciliary muscle , increasing in diameter, ligaments tense, meaning decreasing in it thickness and magnification power, make it able see far object.

- ✓ In the Ciliary body there is an Appendages that have a capillaries filtered to form the aqueous humour
- ✓ if we lose the lens transparency , a cataract , an artificial lens can be set

## C- Choroid: nutrition to the retina

☒ **vitreous body:** is a gel like substance insure retina attachment posteriorly to the choroid layer, a layer responsible of nourishment of the retina, hence the choroid is a vascular layer , so if a vitreous body loss, by an injury (wound) it will cause retina-choroid detachment, then retinal death and Permanent blindness

**3- Retina** : is the most inner layer ,subdivided to tow sublayers, outer pigmented, attached to choroid and inner nervous (the only layer that have a neurons,

- ✓ Many layers in the inner nervous retina , functionally it subdivided to 3 layers
- ✓ Photo receptor layer: cons and rods
- ✓ Bipolar cells, only graded potential
- ✓ Ganglion cells, where the optic n. arise and the only cells of this three able to give action potential
- ✓ in retinal detachment: separation of the tow sub layers from each other , the outer pigmented still attached to the choroid and the innermost layer will detach
- ✓ the recent treatment of this case is by **cauterize certain areas** in the inner eye (by the laser) to insure **attached** of the two layers
- ✓ physiological cup, or blind spot is the area of the inner aspect of the eye where the optic nerve bulge the eye ball, there is no photo receptors here!
- ✓ Lateral to the blind spot is the macula lutea, and in the center of macula lutea is the fovea centralis
- ✓ Macular vision should be in the center of the field of vision in the healthy-eye people
- ✓ The only human receptors that respond to its adequate stimulus by hyper polarization is the cons and the rods

- ✓ Two factors that make the macular vision (specially fovea centralis vision) is the most accurate:
- ✓ High density of cones in fovea, that arranged in one superficial layer instead of 8 or 9 layers in other inner eye areas
- ✓ In the dark, opened Na channels will decrease the cell potential ( make it less negative) but it never reaches the threshold
- ✓ This sub threshold potential changes is the responsible of releasing neurotransmitters in the dark
- ✓ In the light , hyperpolarization become by closing inward Na channels ( the potential become more negative) so inactivation the receptor.

By: Haitham Aied

"وفي الغد - مهما طال الزمن- سنحتفل حتماً، بتحرير الأرض.. تحرير القدس.. تحرير كل ارض فلسطين"

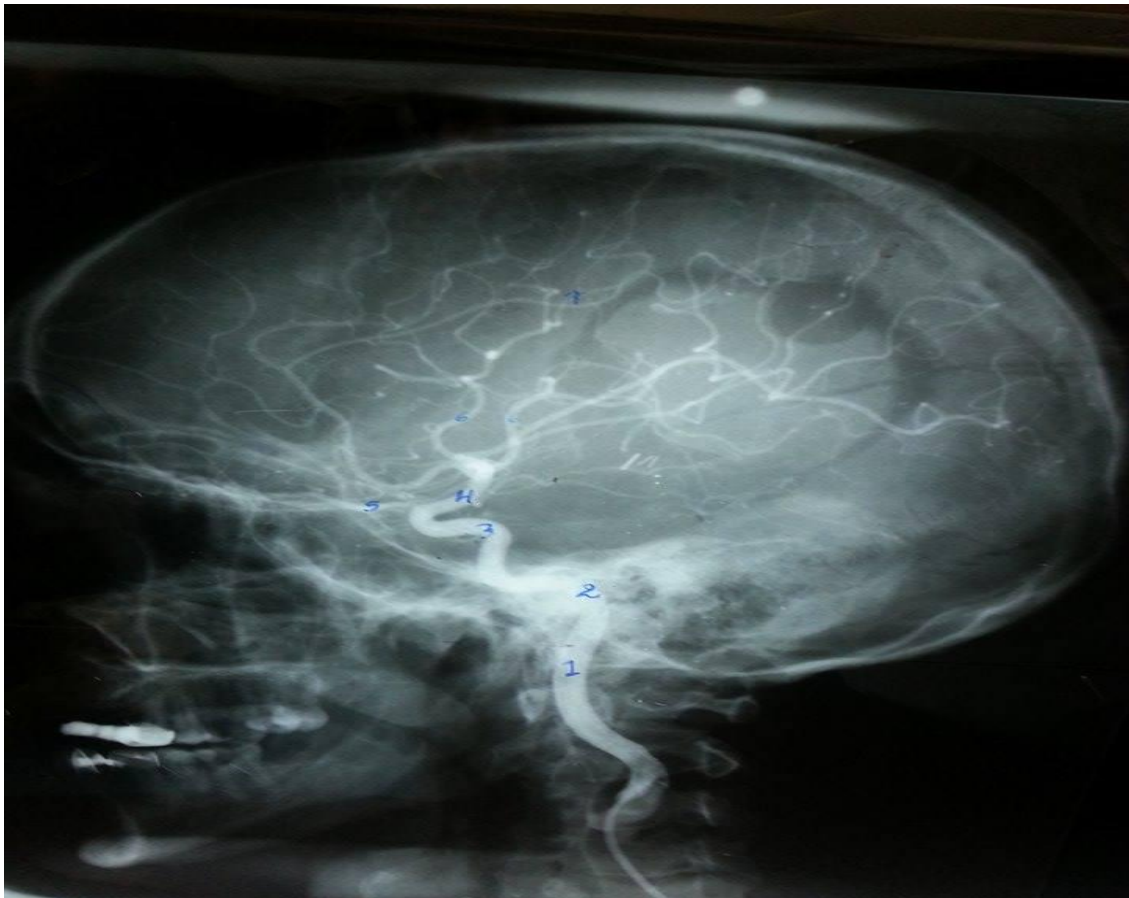
حكيم الثورة، د. جورج حبش



# Angiography

It is a medical imaging technique used to visualize the inside, or lumen, of blood vessels and organs of the body, with particular interest in the arteries, veins, and the heart chambers. This is traditionally done by injecting a radio-opaque contrast agent into the blood vessel and imaging using X-ray based techniques.

## *Internal Carotid Angiography*



1- 1<sup>st</sup> part , Cervical part:

- No divisions, no branches
- Enters cranial cavity through Carotid Canal (within petrous temporal bone)

2- 2<sup>nd</sup> Part, Petrous part:

- Within petrous part of temporal bone
- It's a horizontal segment of IC artery

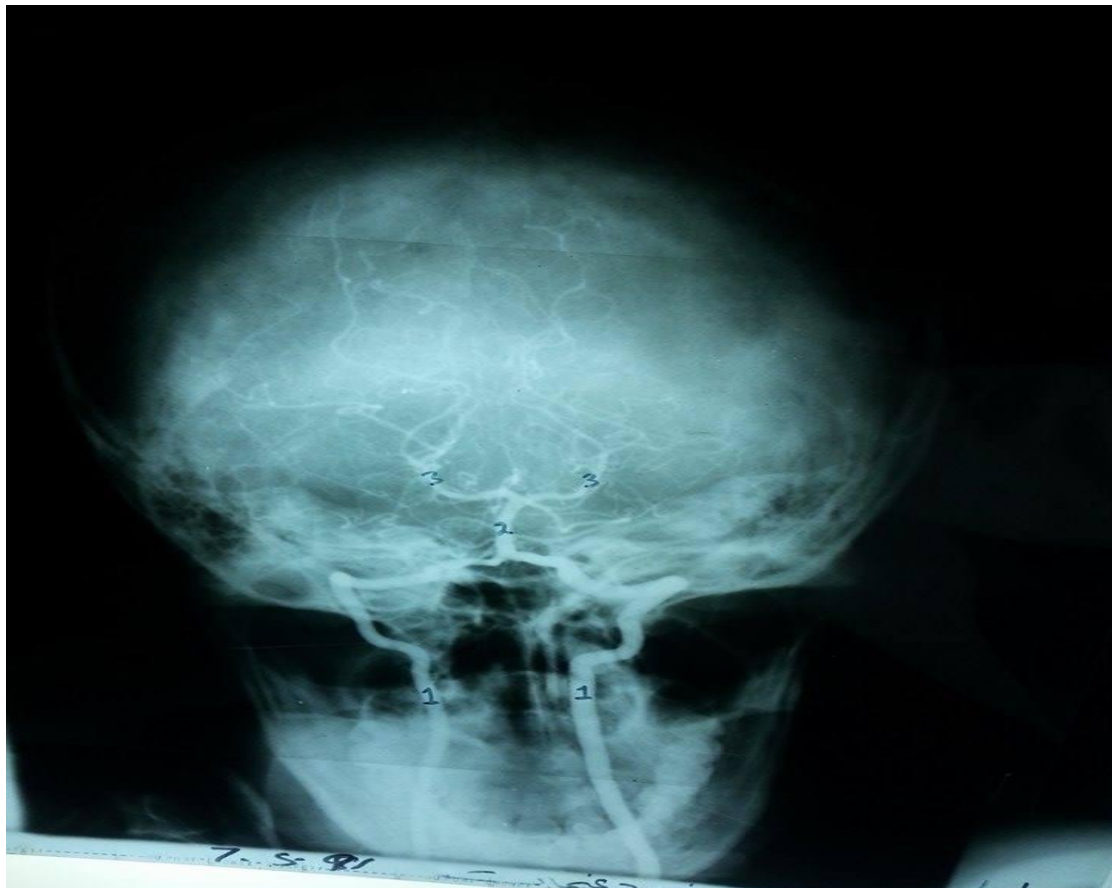
3 & 4 - 3<sup>rd</sup> part , Cavernous part:

- It's called Carotid Siphon
- Pierces the roof of the cavernous sinus
- Gives off a branch (Ophthalmic artery -5-) just before it divides
- Divides into:
  - Middle Cerebral Artery : larger, more in line, more susceptible to embolism, gives off its main branches deep inside Insula.
  - Anterior Cerebral Artery: smaller, curves posteriorly over the corpus callosum giving pericallosal branch and callosomarginal branch.

5- Ophthalmic Artery:

- Gives off central artery of retina, an embolus there causes sudden blindness ( if it's reversible then that is mostly a transient ischemic attack –TIA-, if TIA is not treated immediately; might progress to Stroke)

### ***Vertebrobasilar angiography***



### 1-Vertebral artery:

- It's a branch from the first part of subclavian artery
- Passes through foramen transversarium of the upper 6<sup>th</sup> cervical vertebrae ( along with vertebral vein but the vein descends also through the foramina of the upper 7<sup>th</sup> cervical vertebrae)
- Enters the cranial cavity through foramen magnum
- Passes anterior lateral to medulla where it gives off PICA (posterior inferior cerebellar artery).
- At the upper border of medulla (lower border of pons), it unites with the other vertebral artery forming Basilar artery.

### 2-Basilar artery:

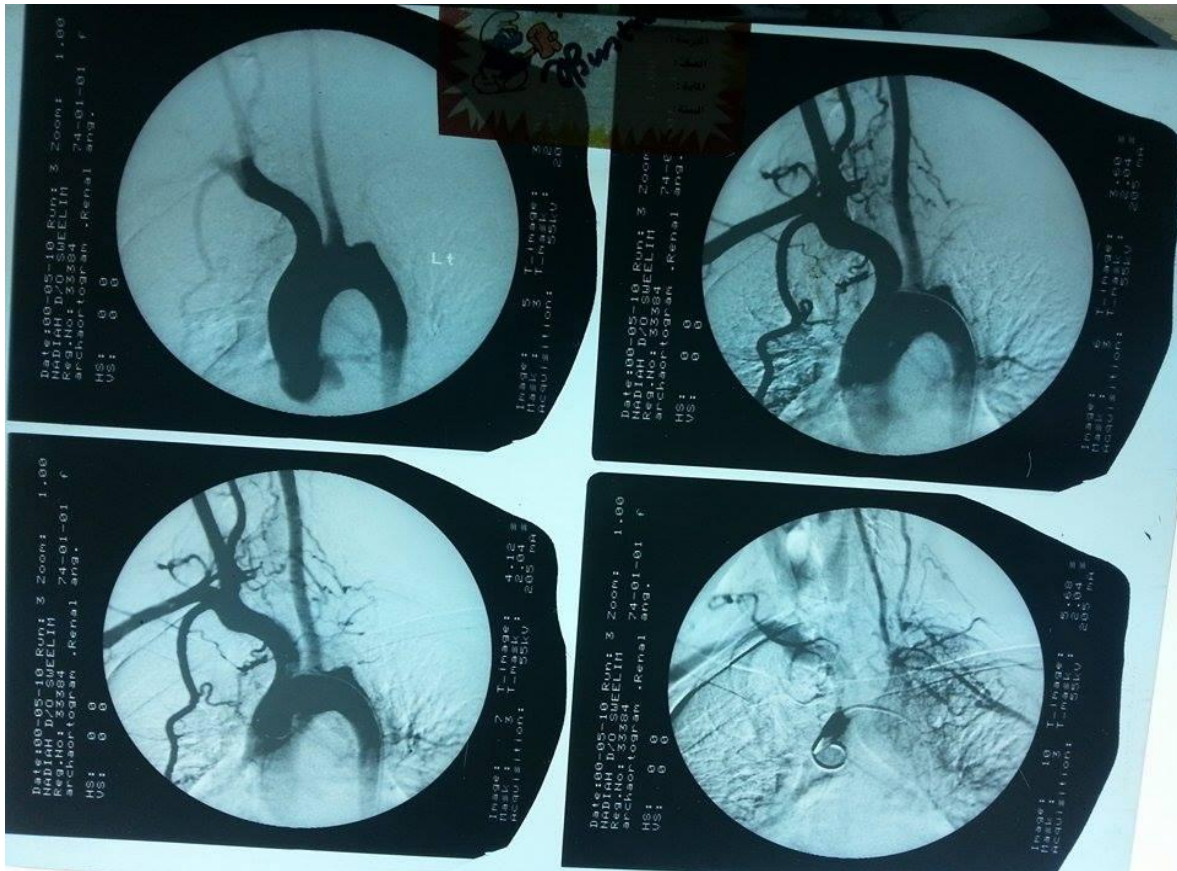
- Ascends along pons and at pons' upper border just before it divides, it gives off Superior cerebellar artery
- At the upper border of pons, it divides into two Posterior cerebral arteries -3-
- Basilar artery length = Pons length

I-Between Posterior cerebral artery and superior cerebellar artery, there are oculomotor and other cranial nerves roots; the most important one we worry about when there's congenital berry aneurysm to one of these two arteries is the oculomotor nerve that might be severely compressed if the aneurysm ruptures.

II -Vertebrobasilar artery communicates with internal carotid artery via posterior communicating artery at each side, and the two anterior cerebral arteries communicate via anterior communicating artery

I & II form circular arteriosus of willis, arteries of this circle are present at the base of the brain within subarachnoid space and they are floating in the CSF.

## Subclavian Steal Syndrome



- Absence of left subclavian artery, either it's a congenital condition or it might be closed by embolus
- The blood supply for the left upper limb is impaired and a collateral circulation arises stealing blood from internal carotid artery

**-Correction team**