

وسهلا



أهلا

يُمنع أخذ السلايدات بدون  
إذن المحرر واي اجراء  
يخالف ذلك يقع تحت طائلة  
المسؤولية القانونية  
جميع المعلومات للاستخدام  
التعليمي فقط

الأستاذ الدكتور يوسف حسين

كلية الطب - جامعة مؤتة - الأردن

دكتورة من جامعة كولونيا المانيا

الواتس (أي استفسار)  
00201224904207

Prof. Dr. Youssef Hussein Anatomy - YouTube

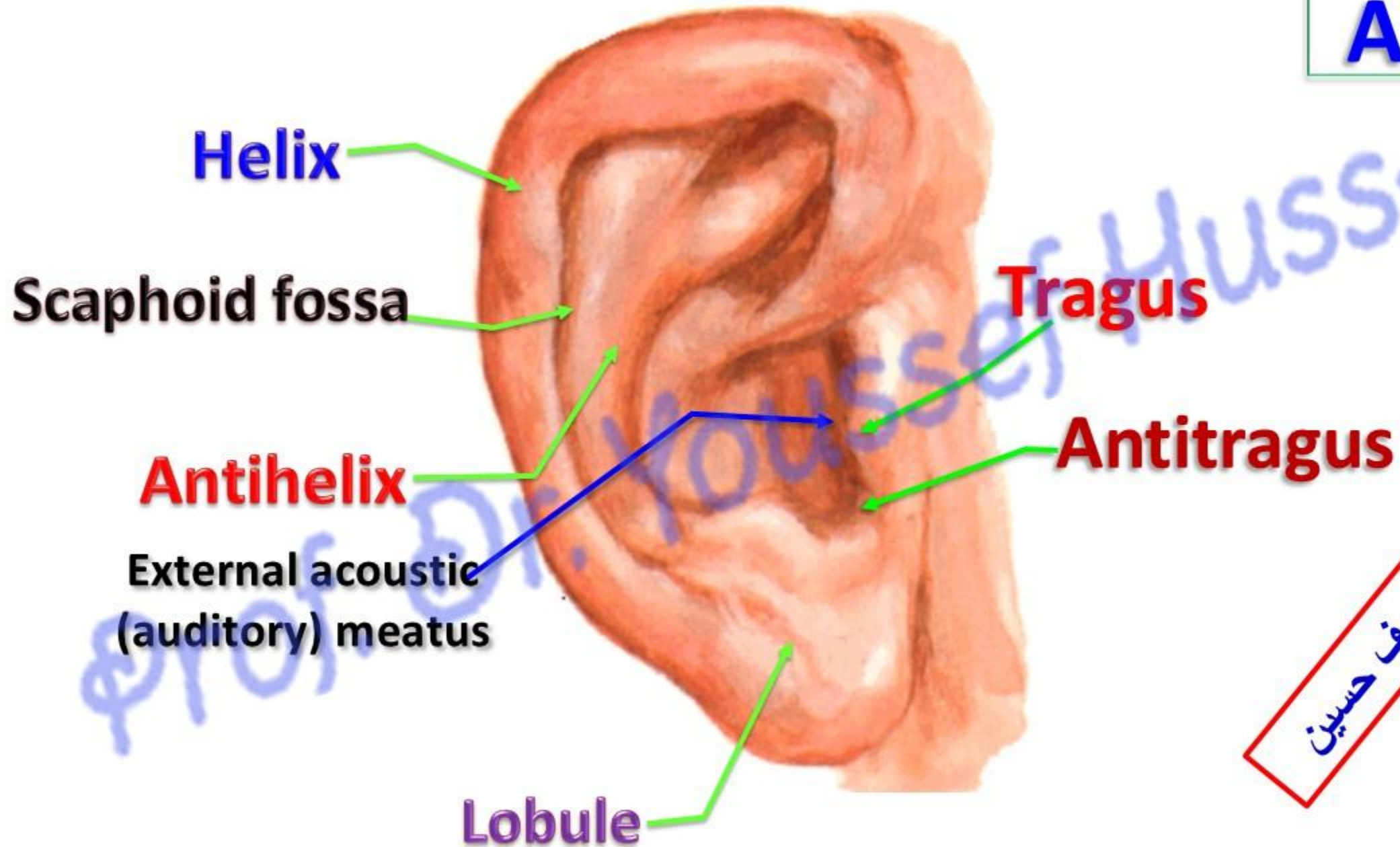
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# External Ear

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# Auricle



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- **External auditory meatus**

- **Length:** about one inch

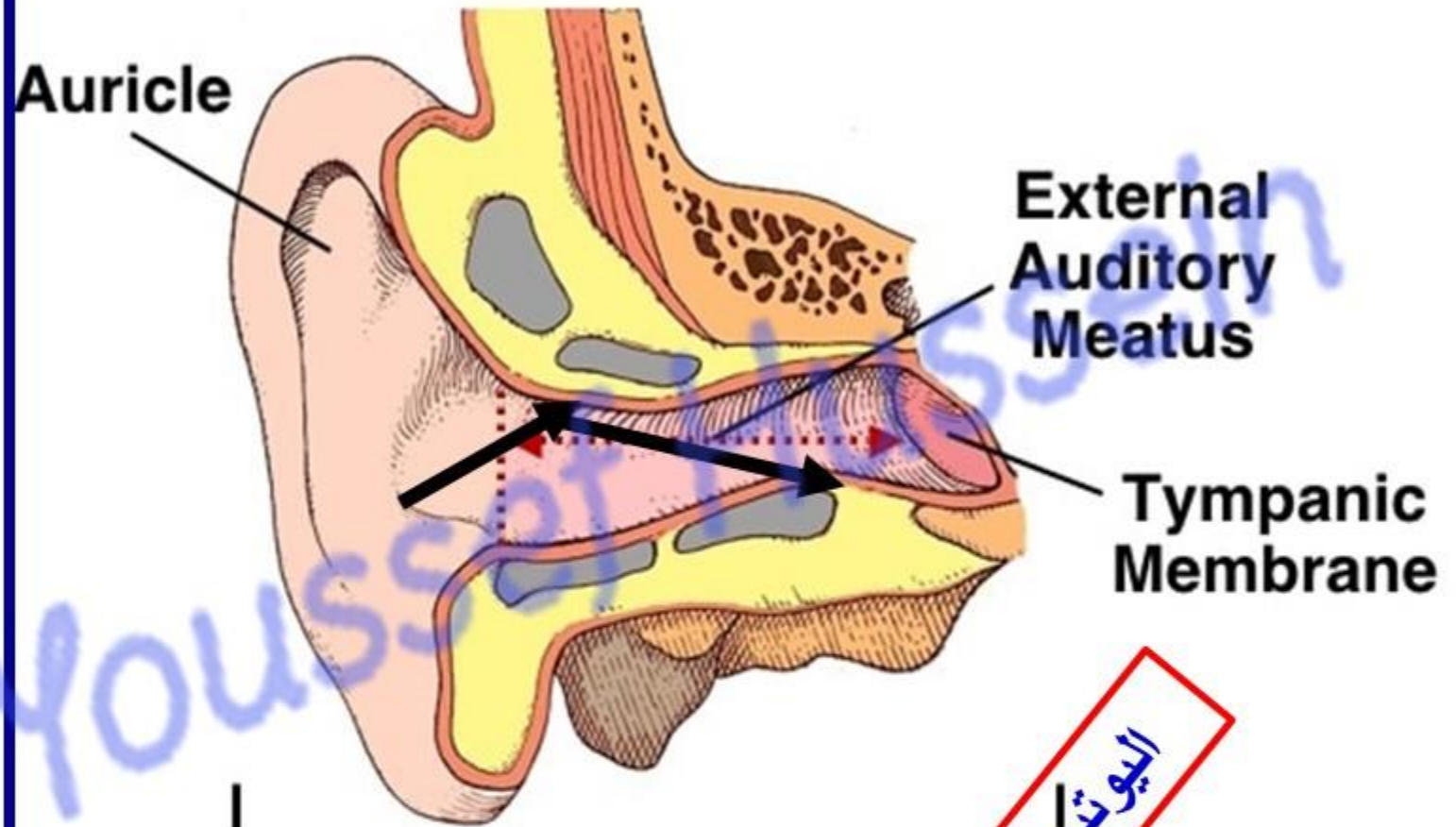
- **Parts:**

**a) Outer 1/3 cartilaginous**, directed upward, forward and medially.

**b) Inner 2/3 bony in temporal bone**, directed downward, forward and medially.

- **Nerve supply;**

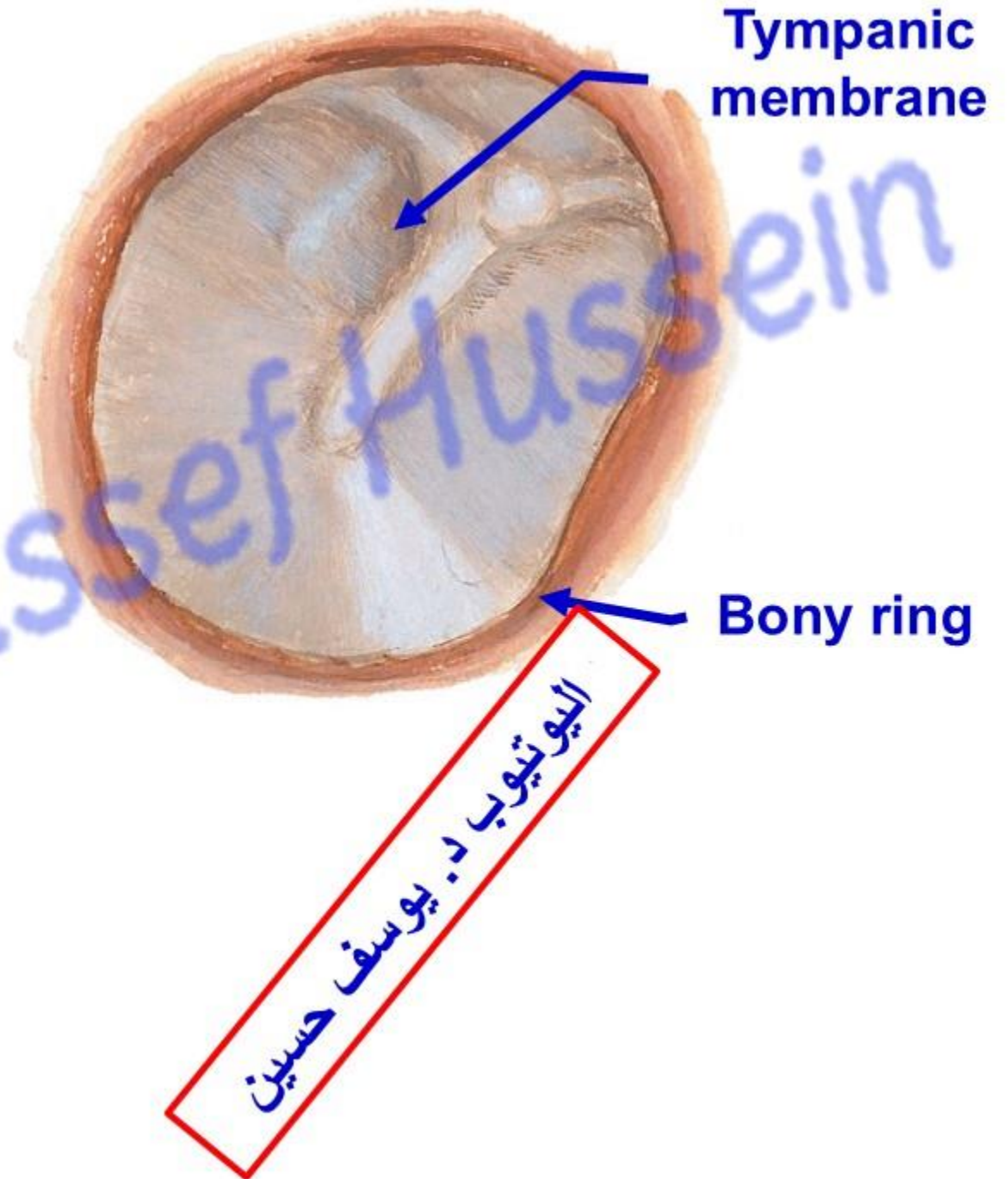
Auriculotemporal nerve and auricular branch of vagus.



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- **Ear drum (tympanic membrane)**
- **Position:** it lies obliquely **between middle and external ear** and forms an acute angle (**55 degree**), **So** the **anterior wall and floor** of the canal is **longer** than posterior wall and roof.
- **Structure:** semitransparent membrane surrounded by bony ring, it is formed of:
  1. Outer layer of skin.
  2. Middle layer of fibrous tissue.
  3. Inner layer of mucous membrane.





- **Ear drum (tympanic membrane)**

**\*\* Surfaces;**

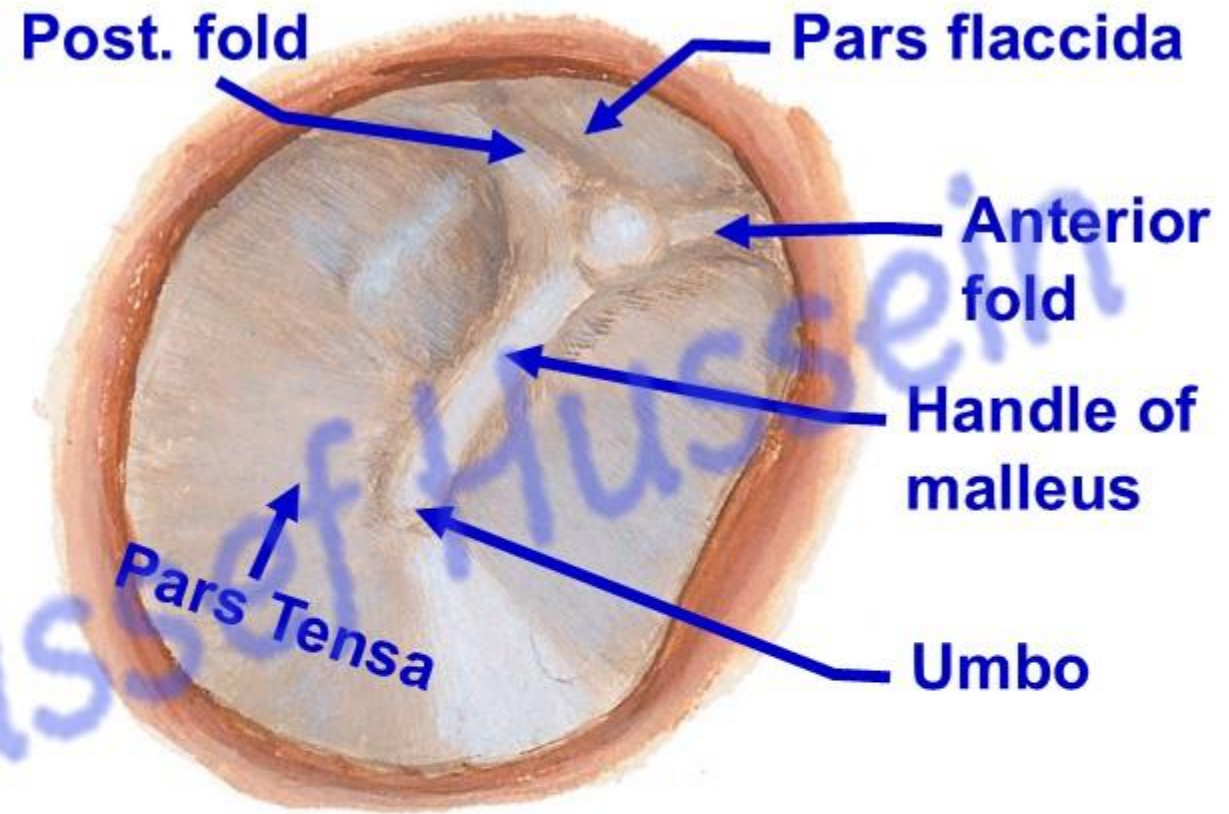
1. **Outer surface, concave.** The most depressed part called **umbo**.
2. **Inner surface, convex,** gives attachment to **handle of malleus**.

**\*\* Parts:**

1) **Pars tensa:** the major part that contains fibrous layer.

2) **Pars flaccida** (Shrapnel's membrane): upper most part does not contain fibrous layer.

- The pars flaccida and pars tensa are separated from each other by 2 folds called **anterior and posterior malleolar folds**.

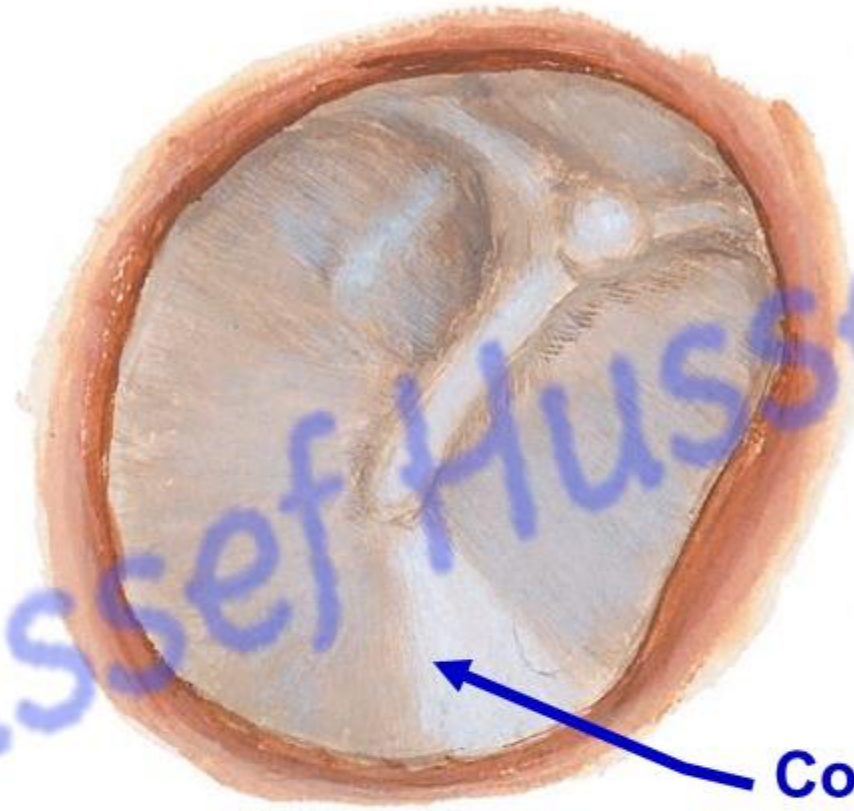


- **Tympanic membrane perforation (Pars flaccida)** is caused by **Otitis media** (middle ear infection) Or trauma, Rapid change in pressure

- It heals within a few weeks without treatment, Sometimes needs surgical repair



- **Cone of light**, Shining light on tympanic membrane causes a cone-shaped reflection of light in **anterior inferior quadrant** during examination of tympanic membrane with an Otoscope.



Cone of light



**Otoscopic  
examination**

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# Middle Ear

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Middle ear laying inside  
petrous part of temporal bone

Inner ear

Auditory tube

Nasopharynx

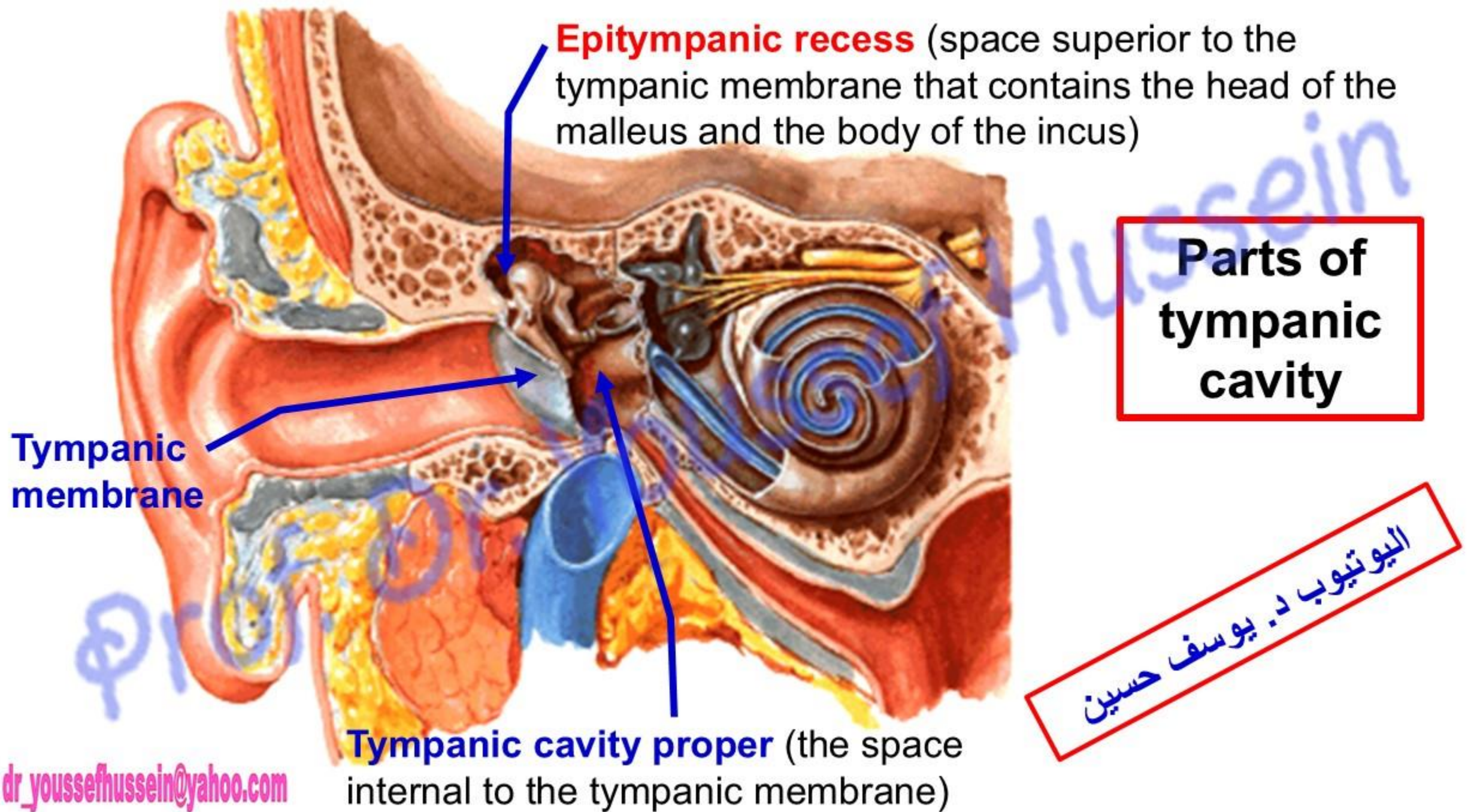
External  
acoustic meatus

Tympanic  
membrane

- **Communications;**
  - **Anteriorly**, with the **nasopharynx** through the auditory tube.
  - **Posteriorly** With the **mastoid air cells** through the mastoid antrum.

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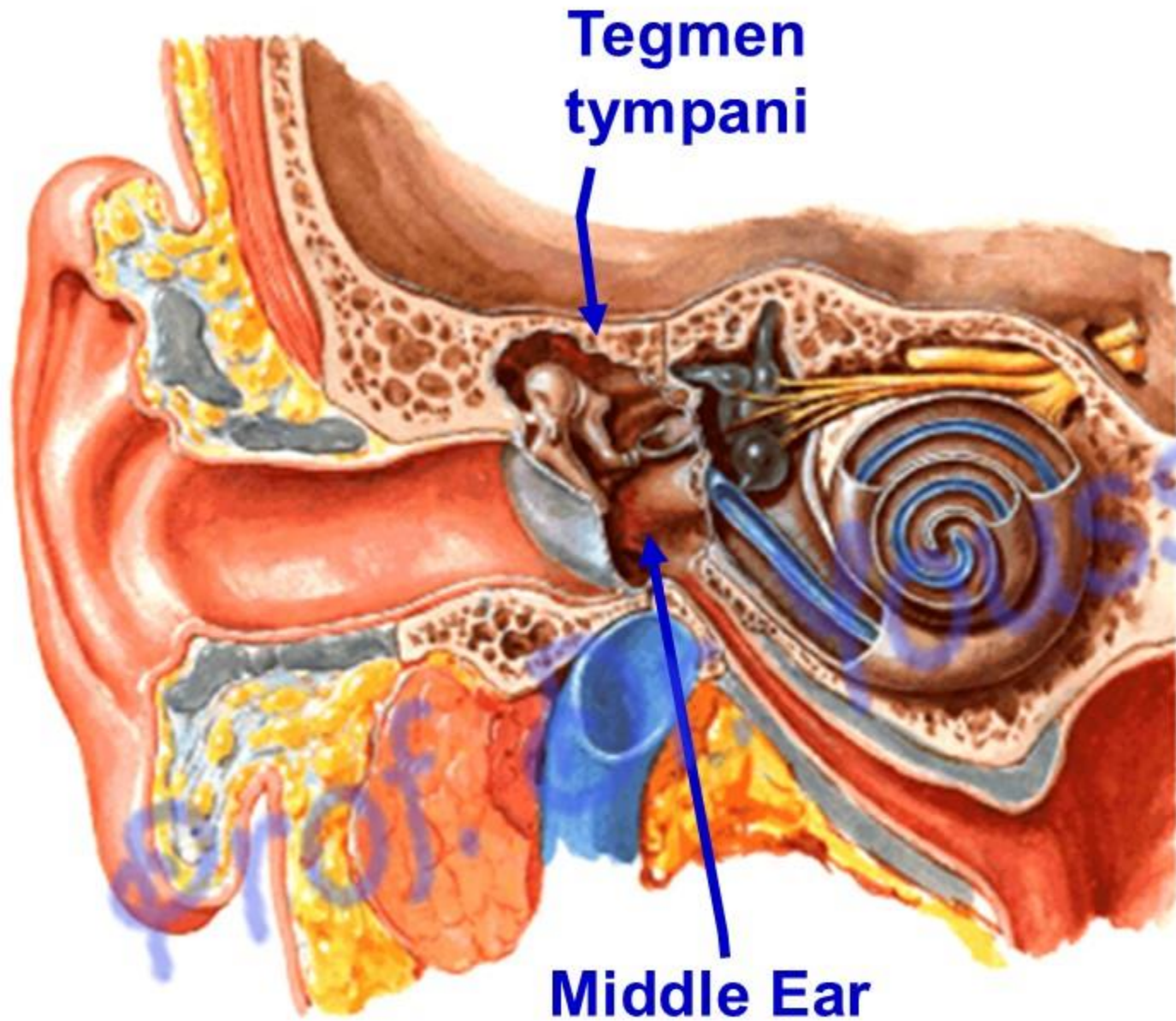




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# Boundaries of Middle East

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- **Roof** (tegmental wall)
  - It is formed by a thin plate of the **petrous part of the temporal bone** (called **tegmen tympani**) which separates it from the **middle cranial fossa**.

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## Middle Ear

## Floor (jugular wall)

- It is formed by a **thin plate of bone** which separates it from superior bulb of internal jugular vein.
- It is **pierced by tympanic branch of glossopharyngeal nerve**.

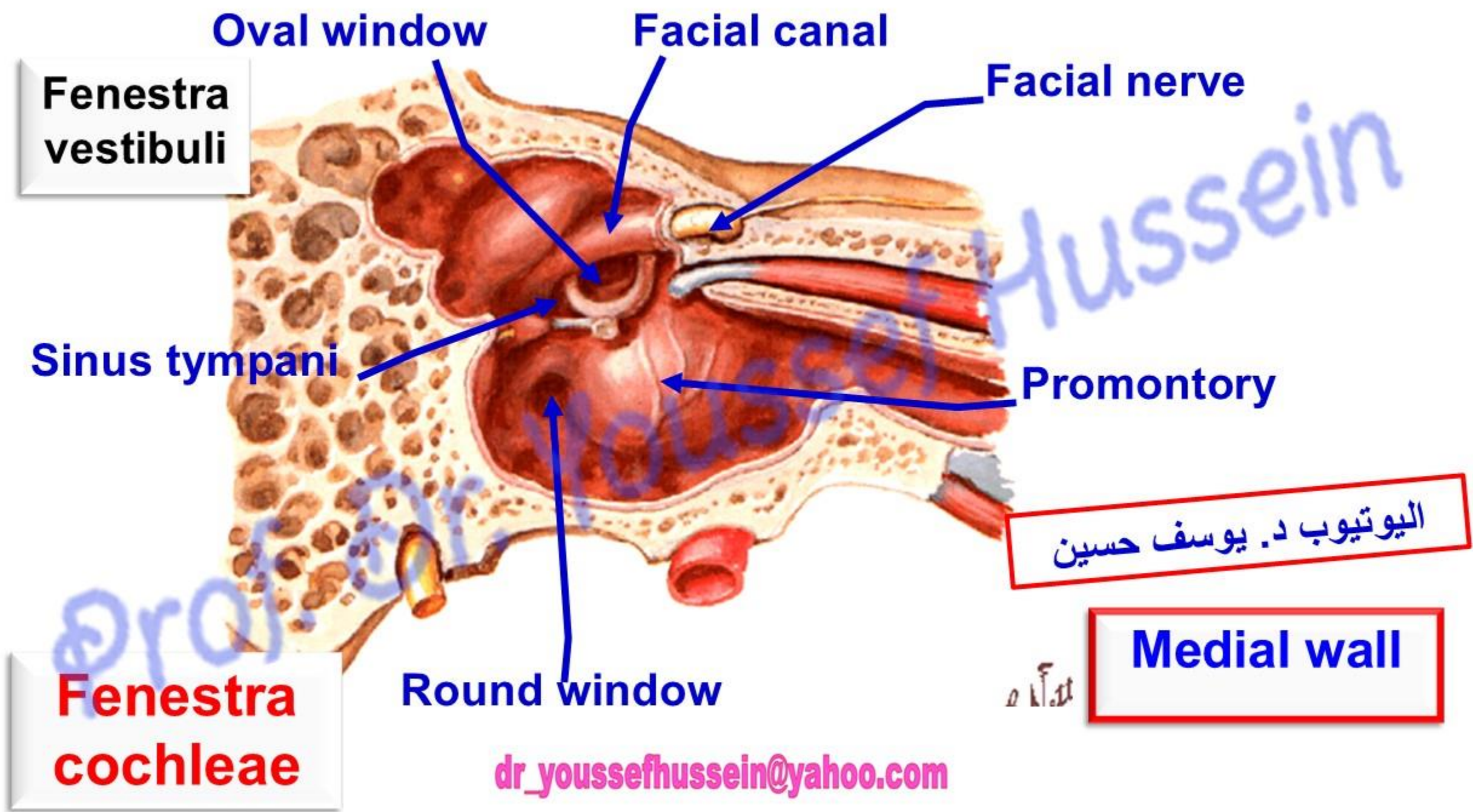
Thin plate of bone

Superior bulb of IJV

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Fenestra vestibuli

Oval window

Facial canal

Facial nerve

Sinus tympani

Promontory

Fenestra cochleae

Round window

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Medial wall

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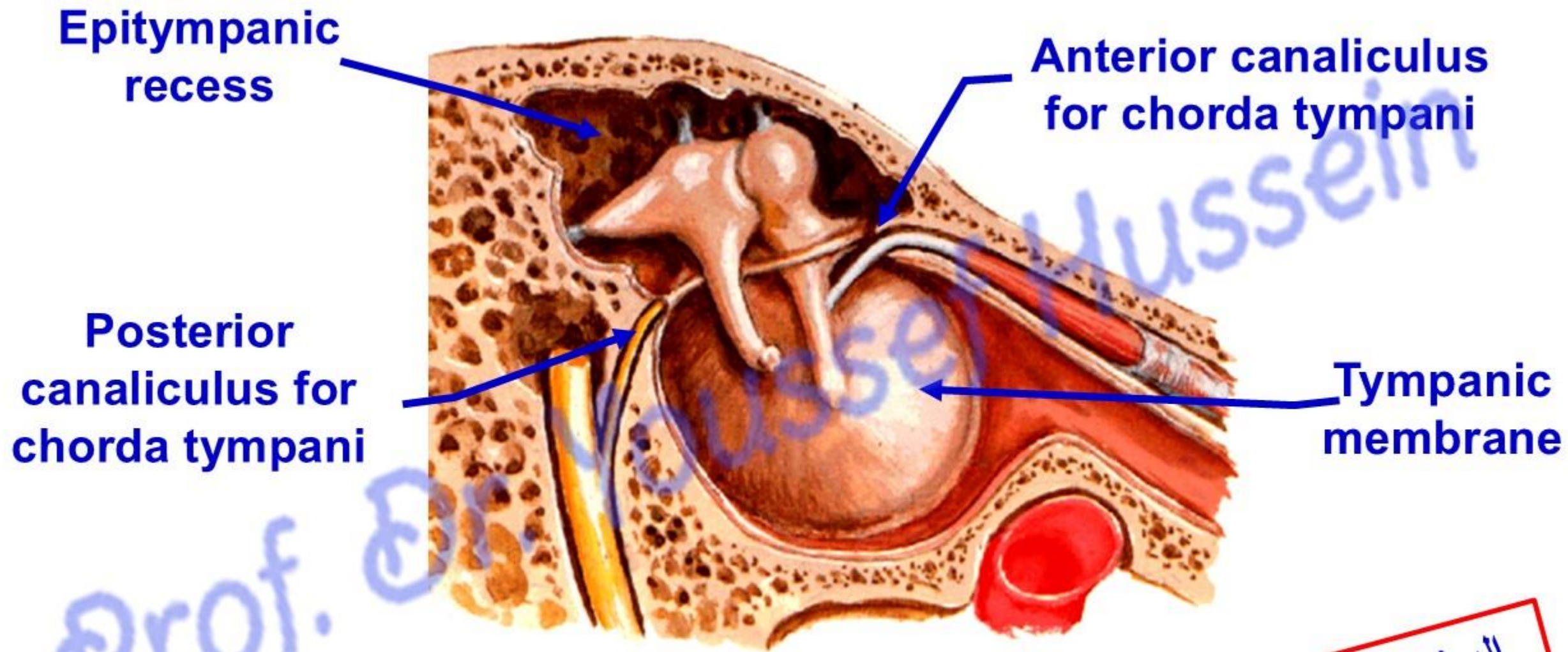


- **Medial (labyrinthine) wall**

- It separates middle ear cavity from inner ear and shows the following:
- **Promontory**: it is produced by the **first turn of the cochlea** of the inner ear and covered by tympanic plexus.
- **Fenestra vestibule** (Oval window): lies above and behind the promontory. It is closed by the **base of the stapes** and leads to the vestibule of the inner ear.
- **Fenestra cochleae** (Round window): lies below and behind promontory and is closed by **secondary tympanic membrane**.
- **Sinus tympani**; a depression between the 2 windows.
- **Horizontal part of facial canal**: above the promontory.

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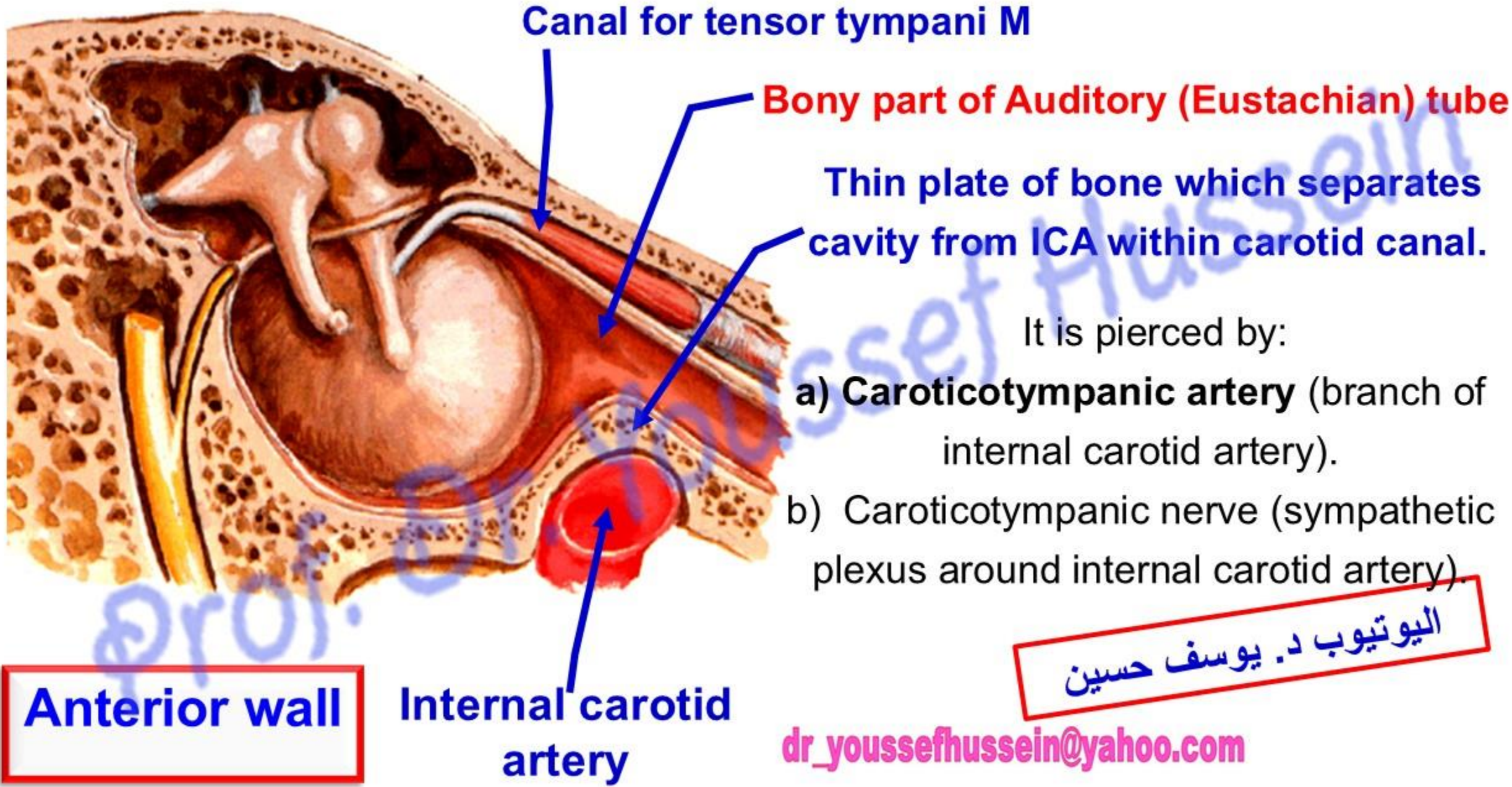




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**Opening to  
mastoid antrum**

communicates with  
the epitympanic  
recess

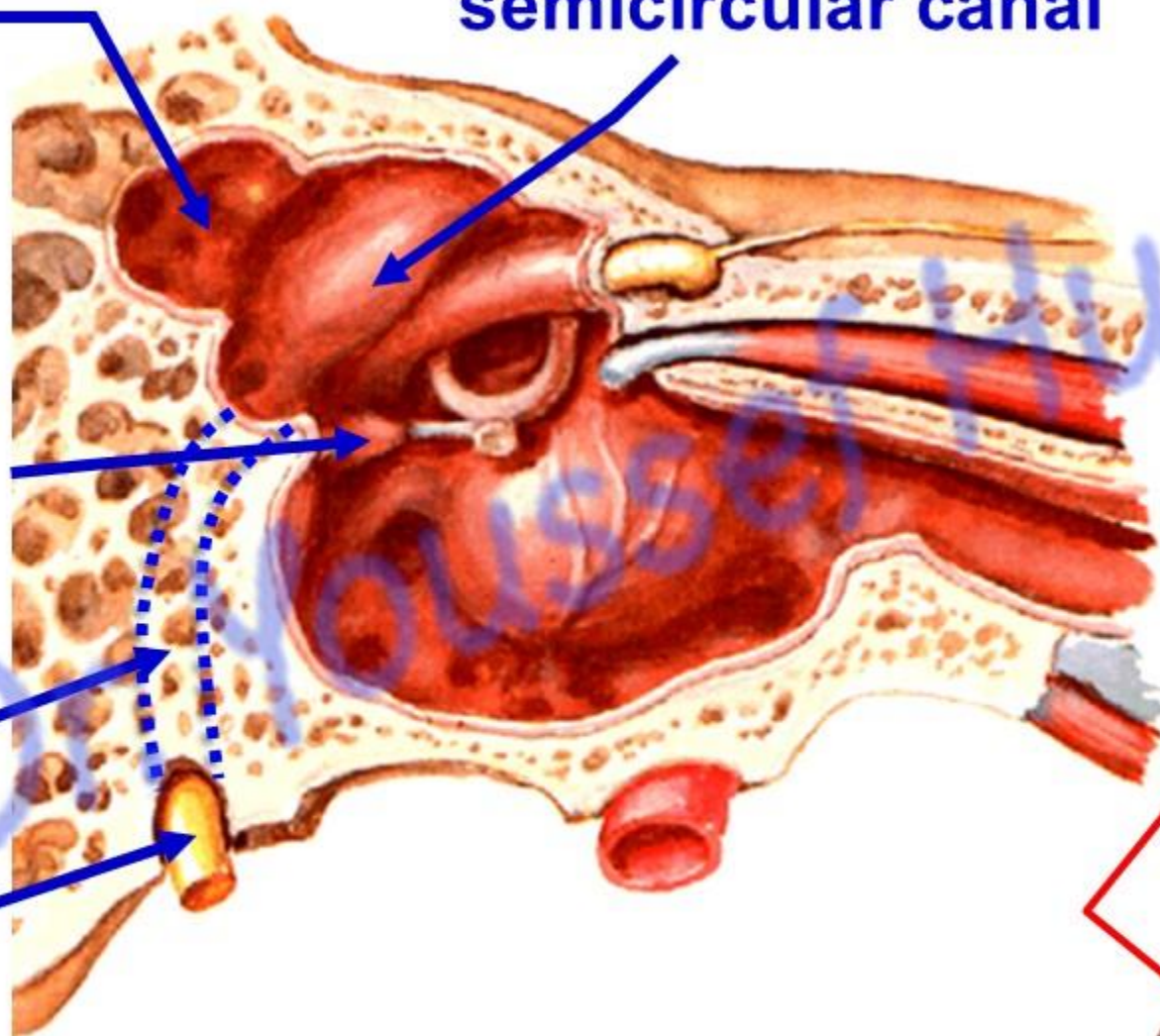
**Pyramid containing  
stapedius muscle**

**Vertical part of  
facial canal**

**Facial nerve**

**Posterior wall**

**Elevation of lateral  
semicircular canal**



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# Contents of Middle Ear

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**Malleus**  
المطرقة

**Incus**  
السندان

**Tensor tympani M**

**Pyramidalis M**

**Stapes**  
الركاب

- **2 nerves** : chorda tympani and tympanic plexus
- **Air**

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• **Malleus:** المطرقة

- It is hammer-shaped. It is the largest one.
- It is formed of

**a- Head** articulates with the body of the **incus**.

**b- Neck** is the narrow constriction just below the head.

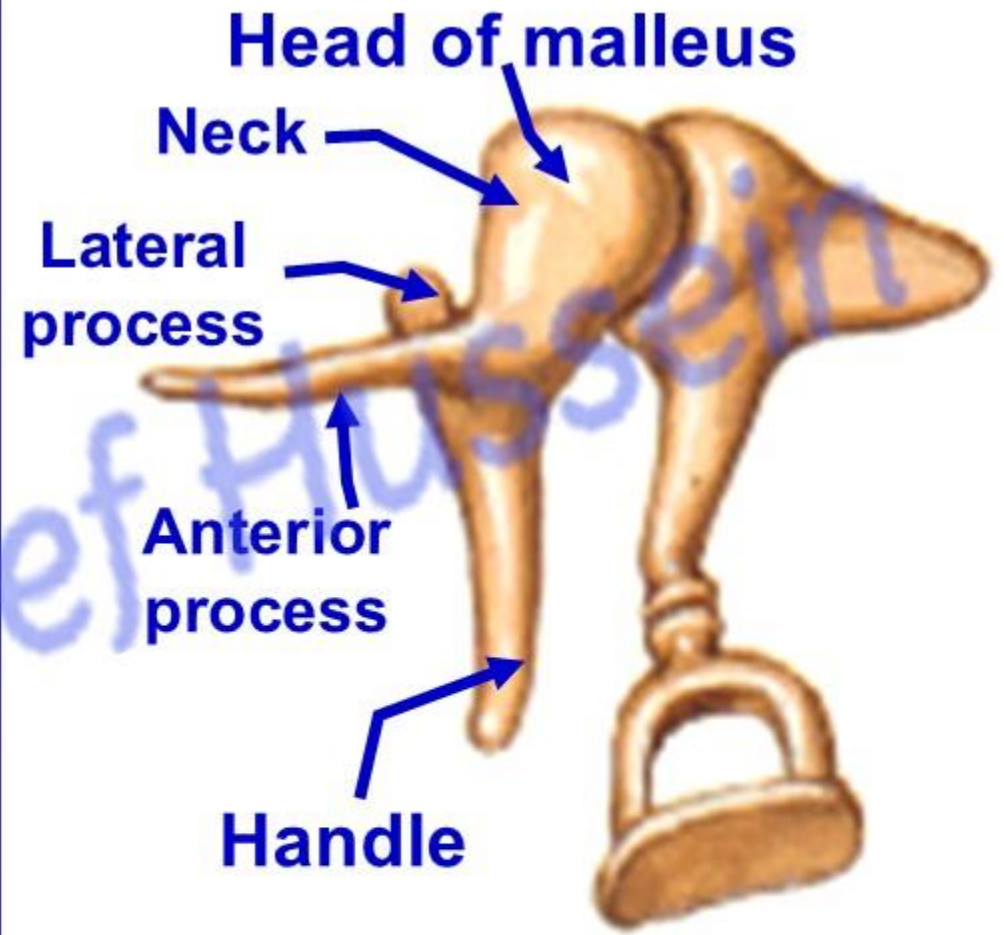
**c- Handle** is attached to inner surface of **tympanic membrane**.

\* The handle receives the **insertion** of the **tensor tympani** muscle.

**d- Anterior process** connected to the petrotympanic fissure by a ligament.

**e- Lateral process** attached to the tympanic membrane.

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▪ **Incus: (intermediate ossicle):**

السندان

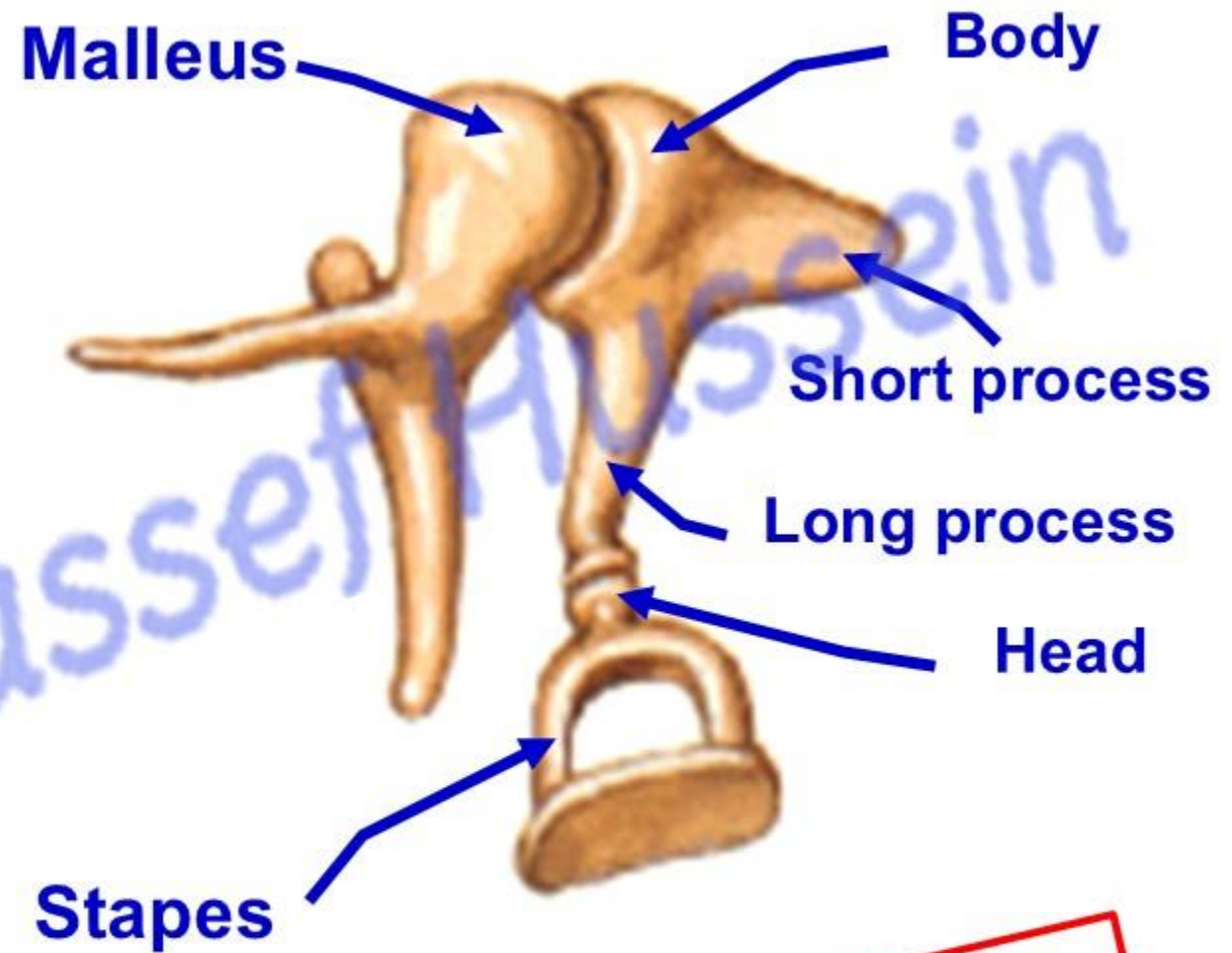
- It is anvil-like

\* It is formed of

\* **Body** articulates with the head of the malleus.

\* **Long process** articulates with the head of head of the stapes.

\* **Short process** conical in shape.



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- **Stapes: (the medial ossicle):** الركاب

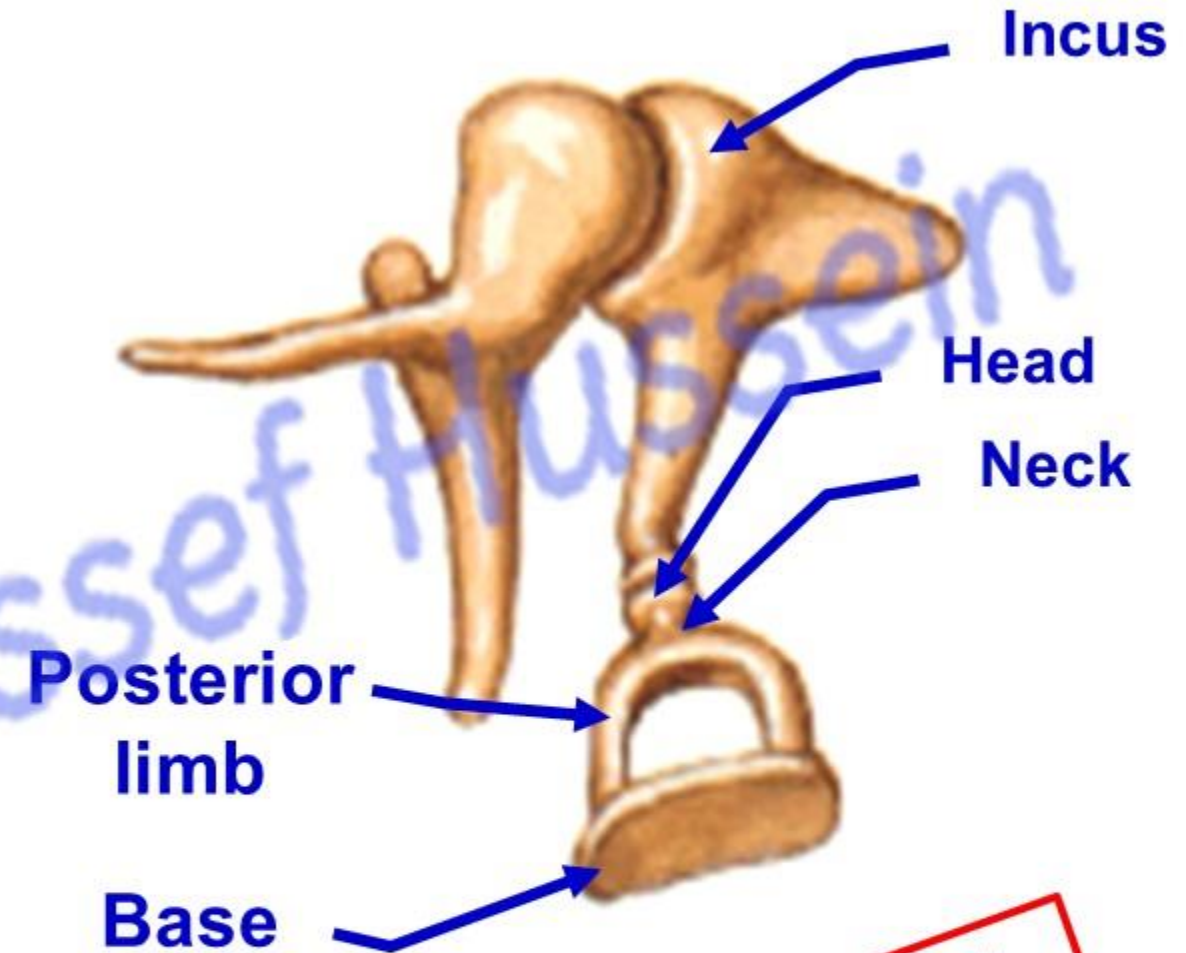
- It is stirrup- like.
- It is formed of.

- \* **Head** articulates with the long process of the incus.

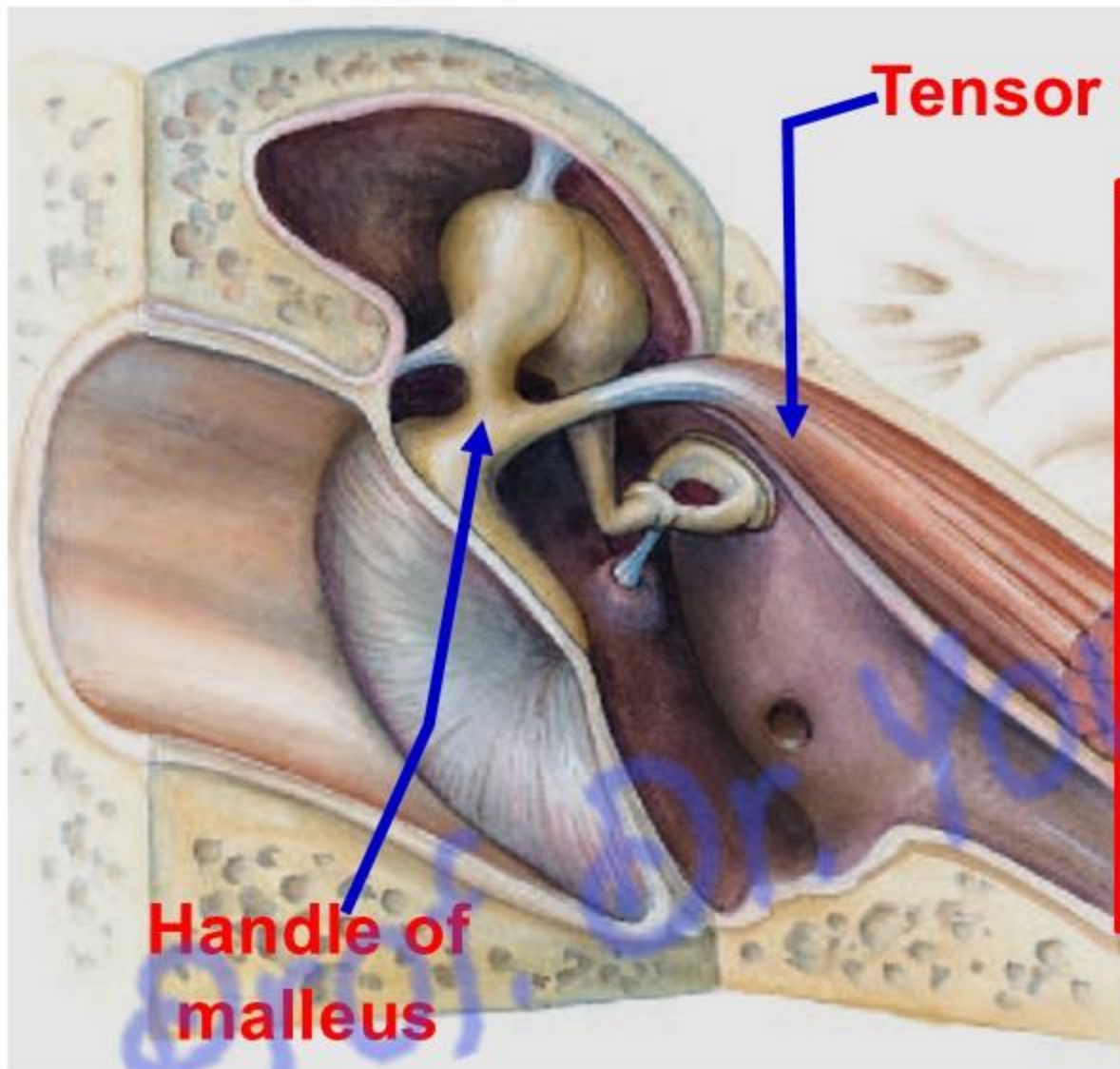
- \* **Neck** is a narrow part below head, revolved insertion of stapedius muscle.

- \* **Two limbs** (posterior and anterior) extend from the neck to the base.

- \* **Base (foot plate)** closed the **Fenestra vestibule** of the inner ear.



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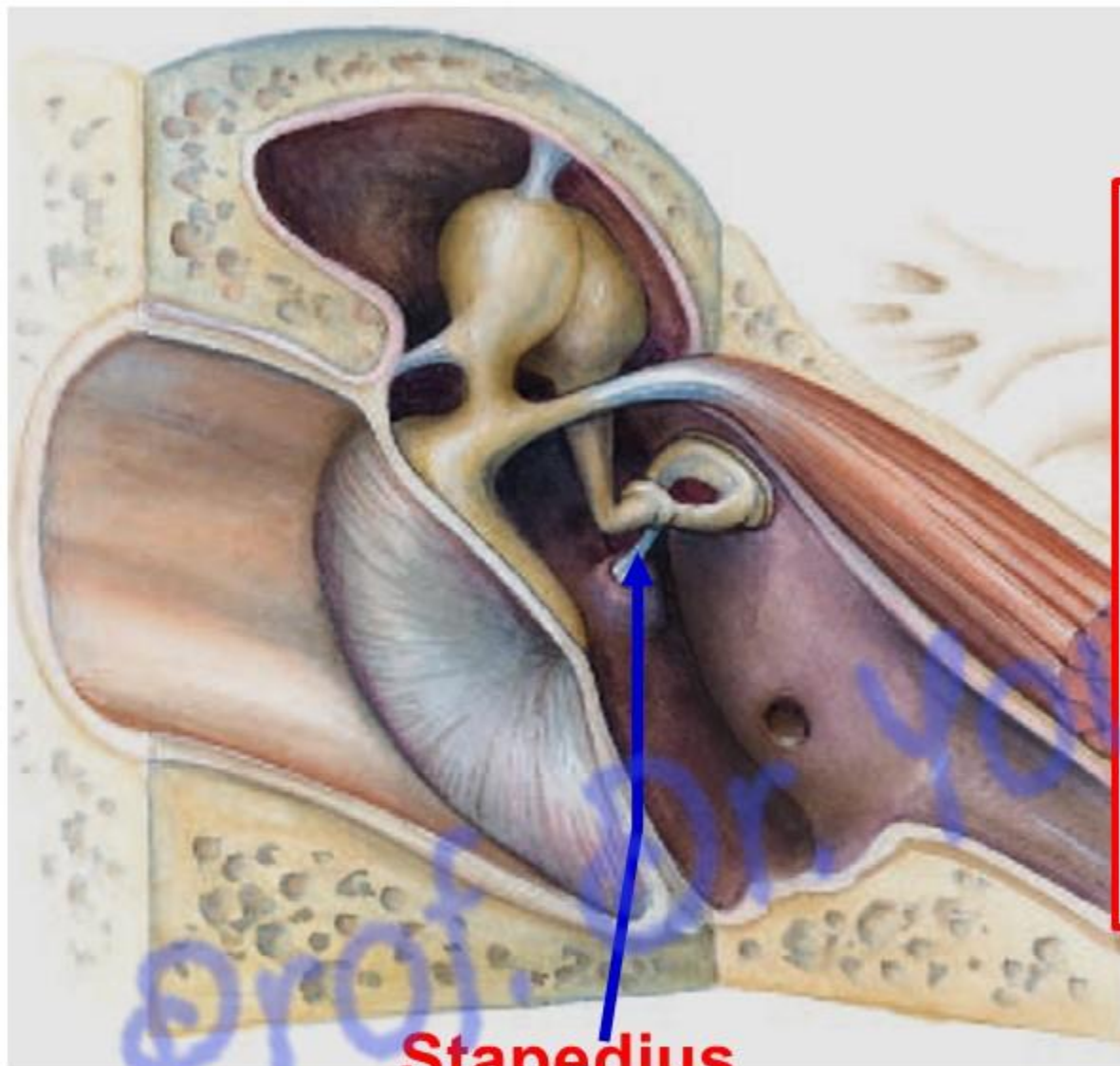
## Tensor tympani M

- \* **Origin:** from cartilaginous part of the auditory tube.
- \* **Insertion:** into the handle of malleus.
- **Nerve supply:** nerve to the medial pterygoid muscle (from trunk of mandibular nerve)
- **Action:** pulls and tens the tympanic membrane

Handle of  
malleus

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**Stapedius**

- \* **Origin:** from the inner walls of the pyramid.
- \* **Insertion:** into the posterior aspect of neck of stapes.
- **Nerve supply:** branch from the facial nerve within the facial canal.
- **Action:** pulls the stapes, damping down (protective effect against high pitched sound vibration).

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- **Arterial supply of the middle ear**

- 1- **Anterior tympanic artery**: from the first part of maxillary artery.
- 2- **Superior tympanic artery**: from the middle meningeal artery from the first part of maxillary artery.
- 3- **Posterior tympanic artery**, branch of the stylomastoid artery (from posterior auricular artery) ECA.
- 4- **Inferior tympanic artery**: from the ascending pharyngeal artery ECA.
- 5- **Caroticotympanic artery**: from the internal carotid artery

\* **Lymphatic drainage of the middle ear** Into the preauricular and upper deep cervical lymph nodes.

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- **Applied anatomy;**

- **Hyperacusis**, In **facial paralysis**, Sound waves are transmitted without any protective control because of paralysis of the **stapedius**.
- **Otitis media** is a condition of **middle ear infection** that may be spread from the nasopharynx through the auditory tube, causing rupture of tympanic membrane.
- **Fracture of middle cranial fossa** causes bleeding from the ear and discharge C.S.F.
- **Otosclerosis** is a condition of **abnormal bone formation** around the stapes and the oval window, limiting the movement of the stapes and thus resulting in **deafness**.
- **Auditory stimuli** are faster than visual stimuli because the sensory process for light is more neurologically complex (**NORMAL**).
- **Pouch of Prussack**: (small recess in the tympanic cavity medial to the pars flaccida), inflammation of this pouch leading to rupture of the pars flaccida.

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## EUSTACHEAN TUBE or Auditory tube

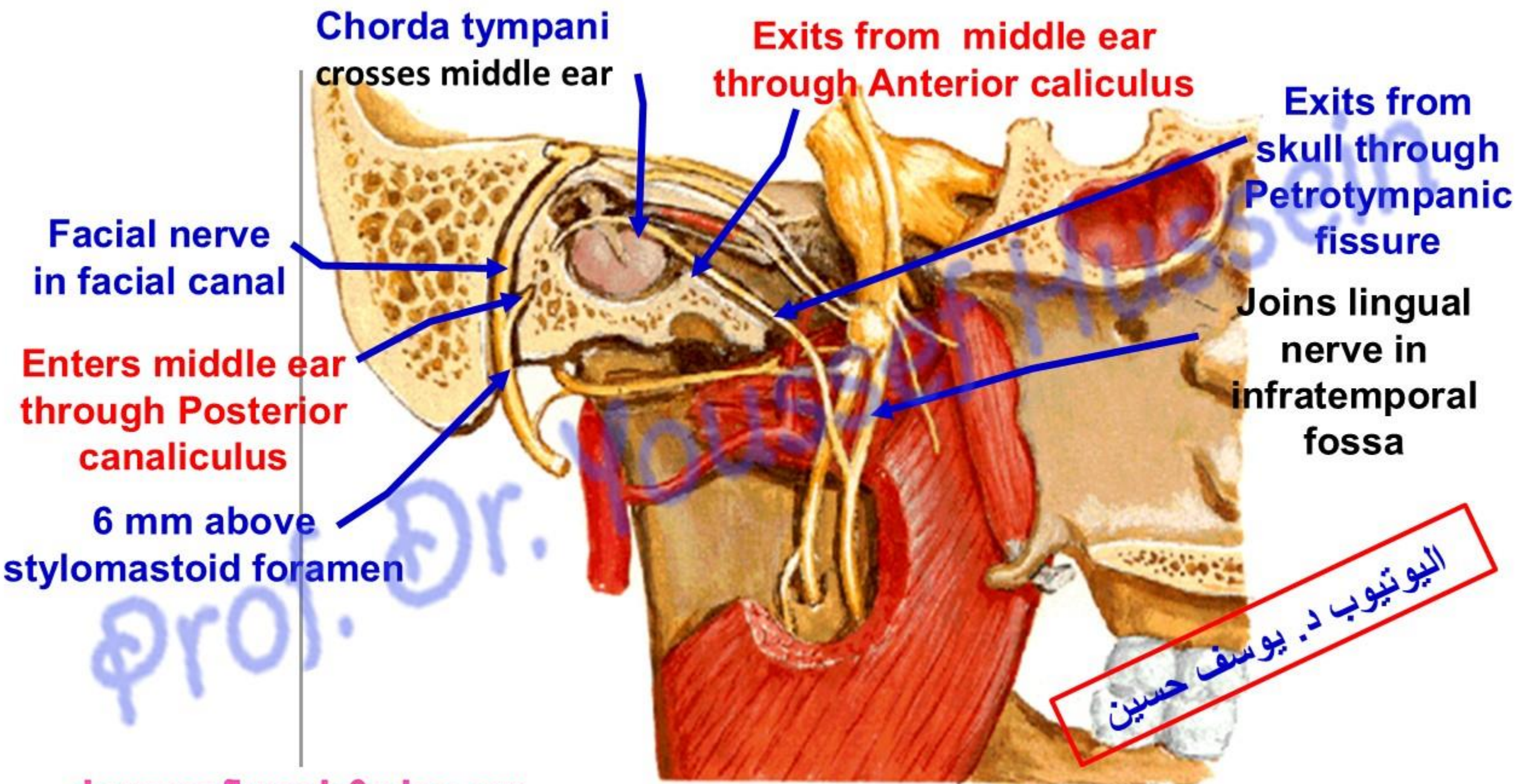
- It extends downward, forward and medially from the middle ear cavity to nasopharynx
- Its lateral 1/3 is bony part while the medial 2/3 is cartilaginous.
- It **equalizes pressure** of the air on both sides of the tympanic membrane.
- It forms angle 45° with the sagittal plane (Adult) while in infant, it is shorter and more horizontal, **So Otitis media** is more common in children.

### • Mastoid Antrum

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- This is an ear sinus in the petrous part of the temporal bone
- It connects with the epitympanic recess of the middle ear by the aditus.
- It acts as a buffer system of air (Releasing air into middle when pressure is too low).
- **Its Lateral wall** is formed by the **suprameatal triangle** of the temporal bone.
- **Its medial wall** related to the posterior semicircular canal.
- **Its roof** formed by the tegmen tympani which separates it from the middle cranial fossa.
- **Posteriorly**, it is related to the sigmoid sinus.





**Chorda tympani  
crosses middle ear**

**Exits from middle ear  
through Anterior caliculus**

**Exits from  
skull through  
Petrotympanic  
fissure**

**Joins lingual  
nerve in  
infratemporal  
fossa**

**Facial nerve  
in facial canal**

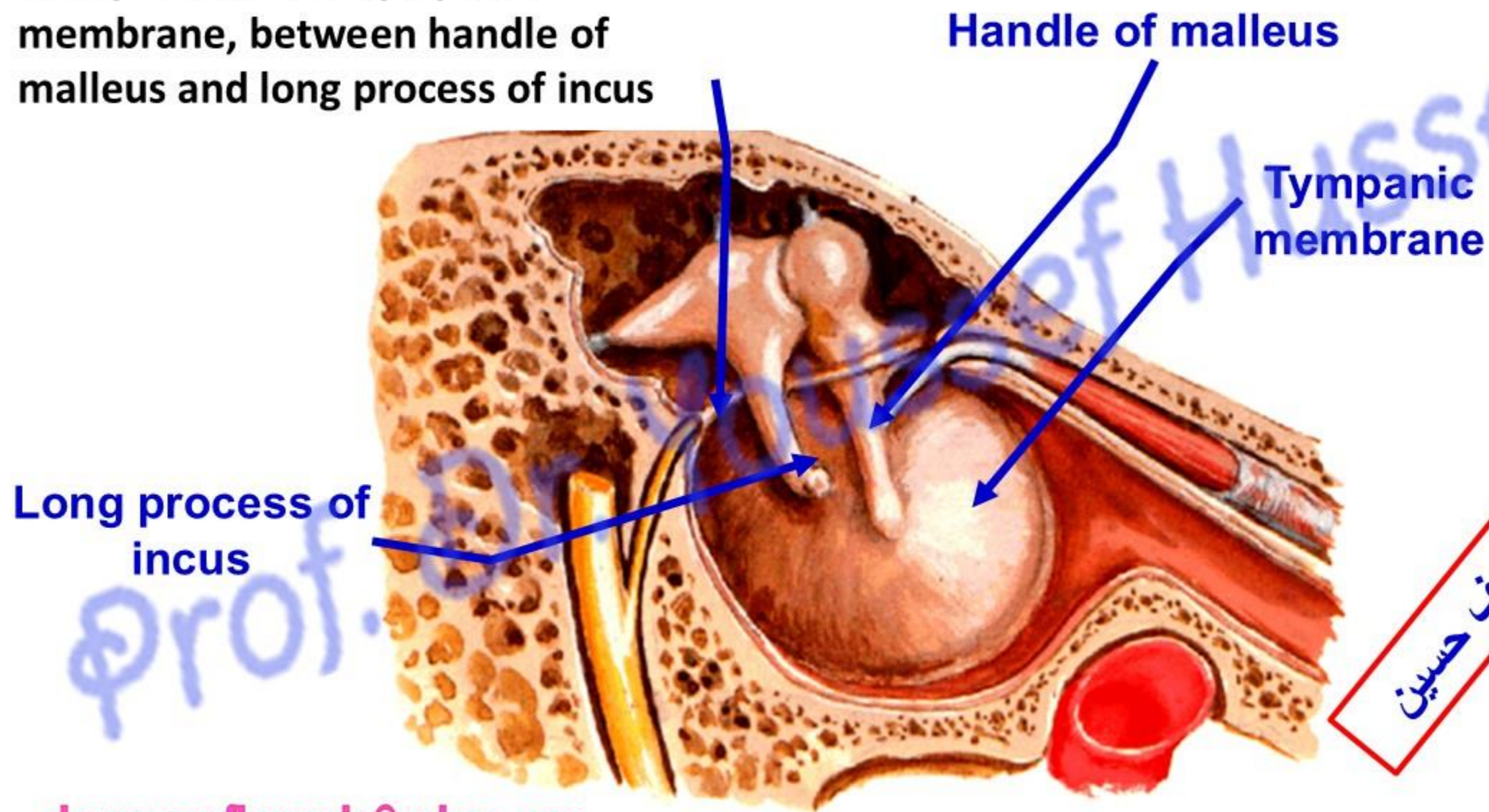
**Enters middle ear  
through Posterior  
canaliculus**

**6 mm above  
stylomastoid foramen**

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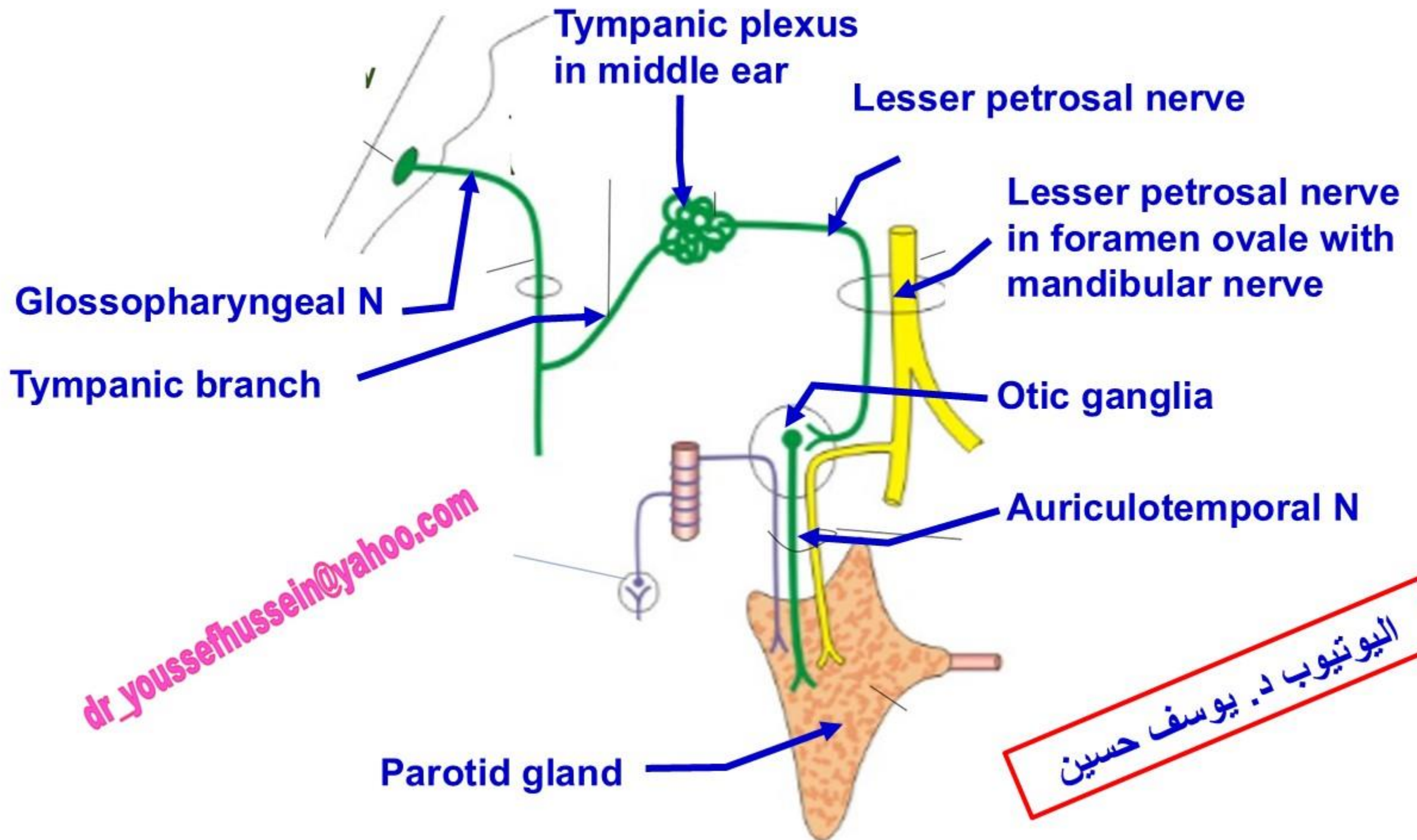


**Chorda tympani** crosses tympanic cavity , related to tympanic membrane, between handle of malleus and long process of incus



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Thank You

Questions

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