

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

Prof. Dr. Youssef Hussein Anatomy - YouTube

الواتس (أي استفسار)
00201224904207

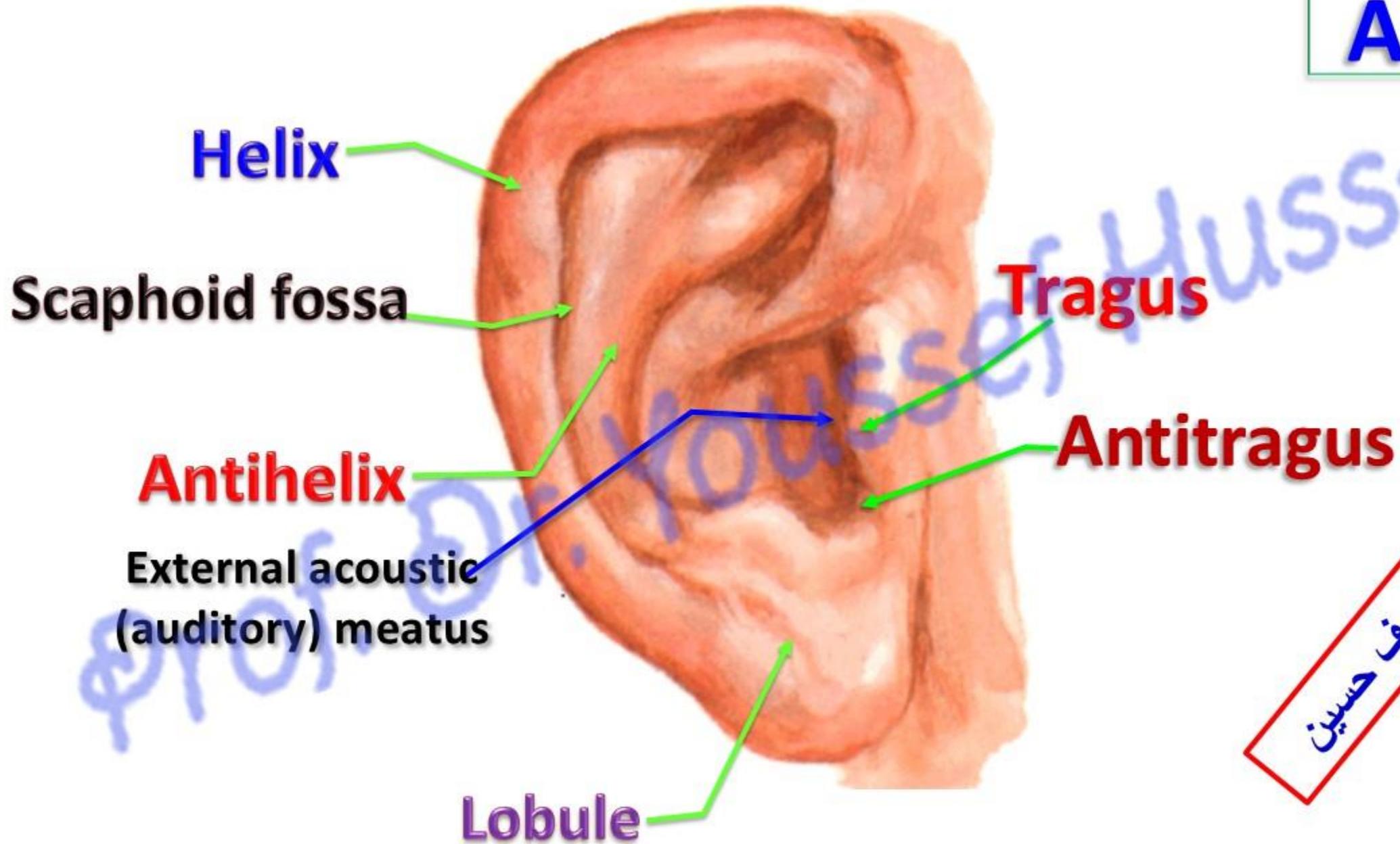
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External Ear

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Auricle



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- **External auditory meatus**

- **Length:** about one inch

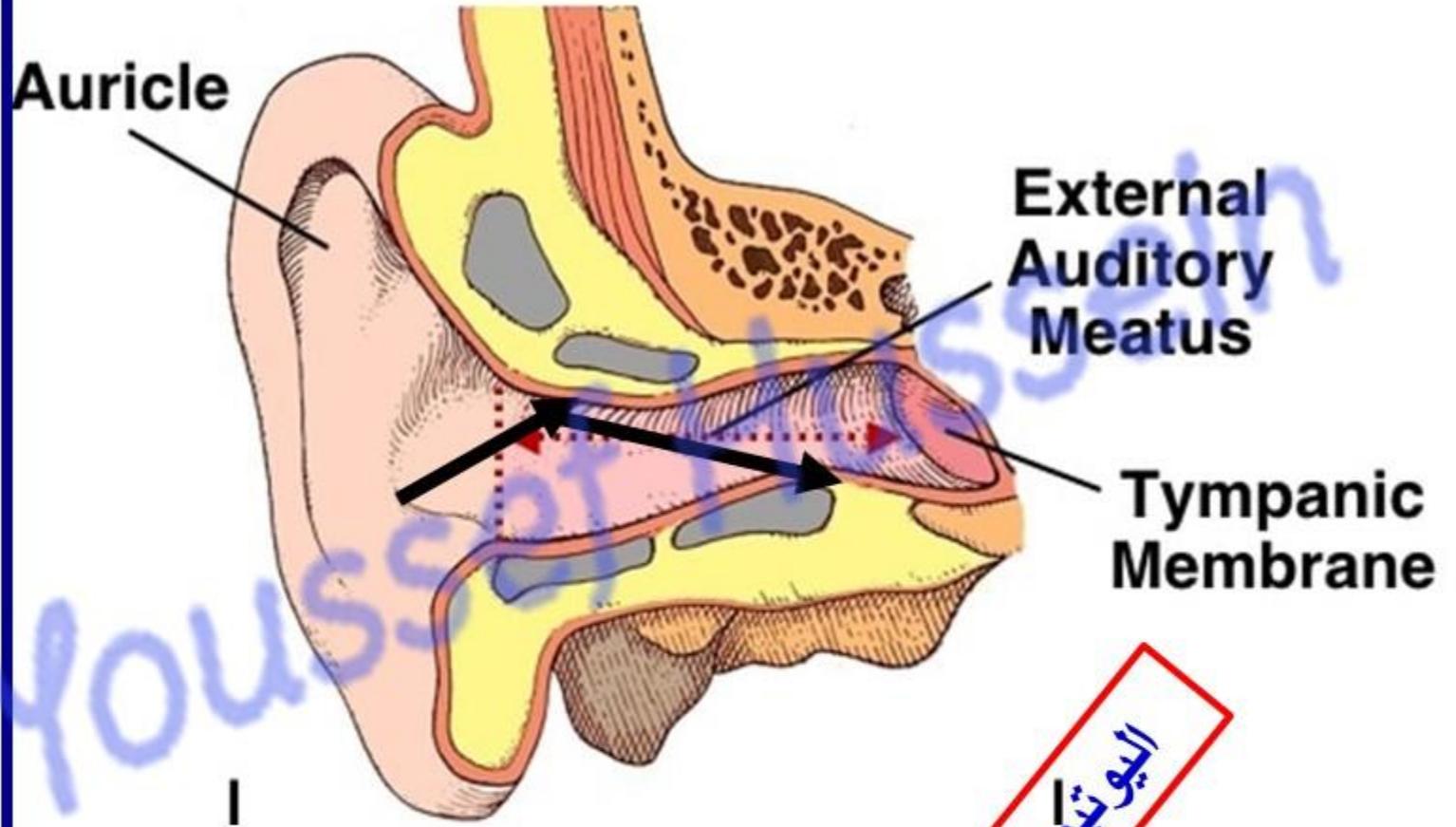
- **Parts:**

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

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

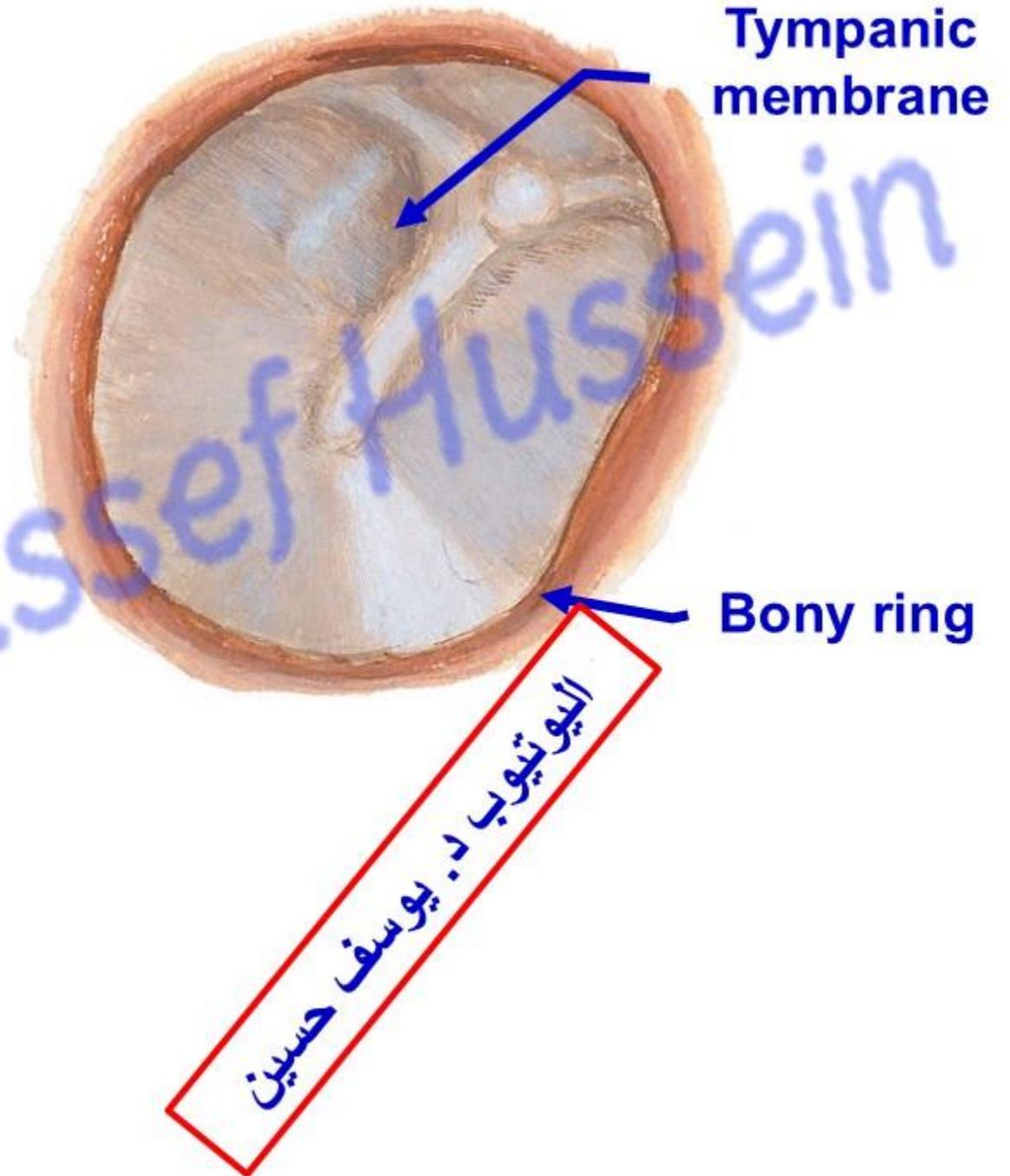
- **Nerve supply;**

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;**

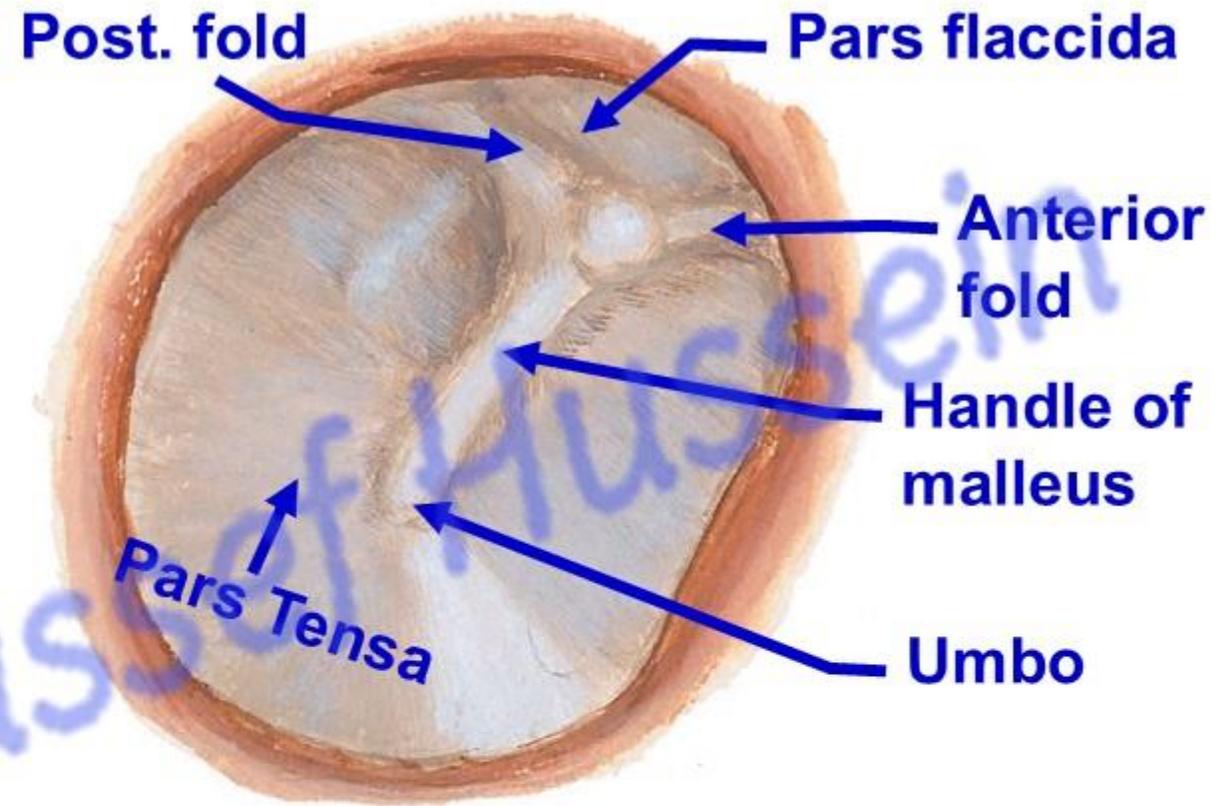
1. **Outer surface, concave.** The most depressed part called **umbo**.
2. **Inner surface, convex,** gives attachment to **handle of malleus**.

**** 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.

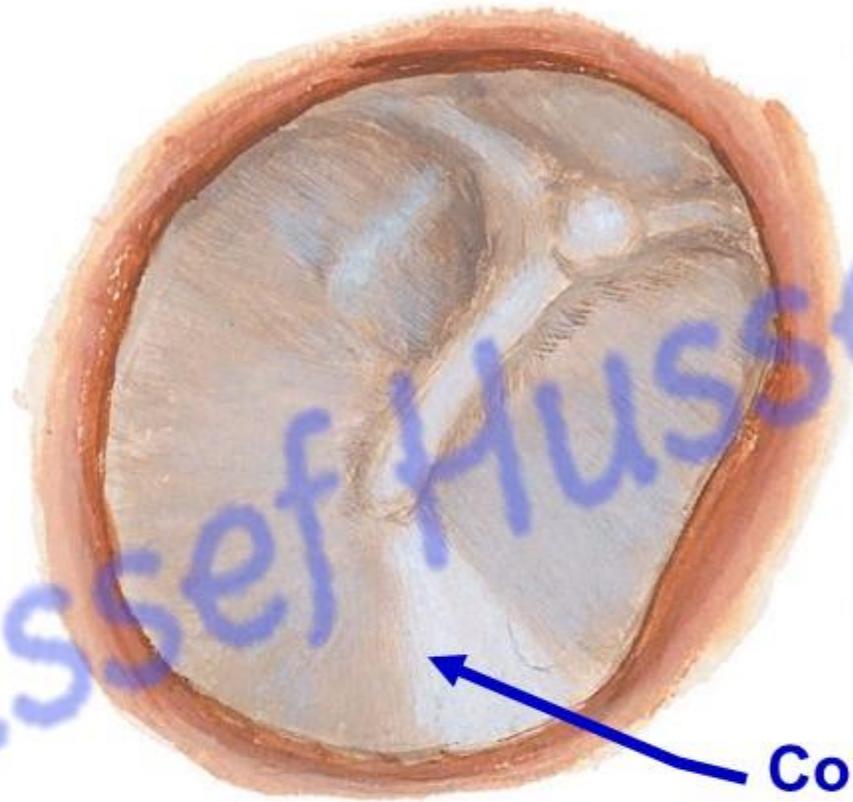
- The pars flaccida and pars tensa are separated from each other by 2 folds called **anterior and posterior malleolar folds**.



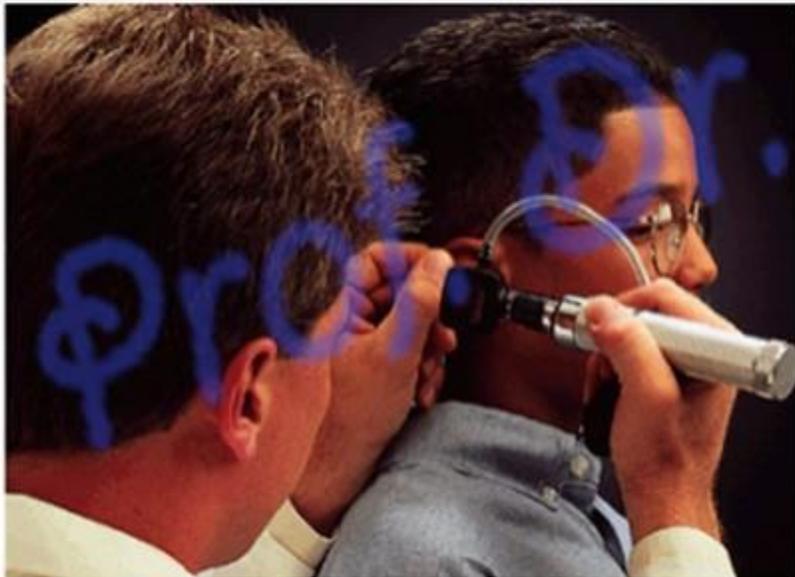
- **Tympanic membrane perforation (Pars flaccida)** is caused by **Otitis media** (middle ear infection) Or trauma, **Rapid change in pressure**

- 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

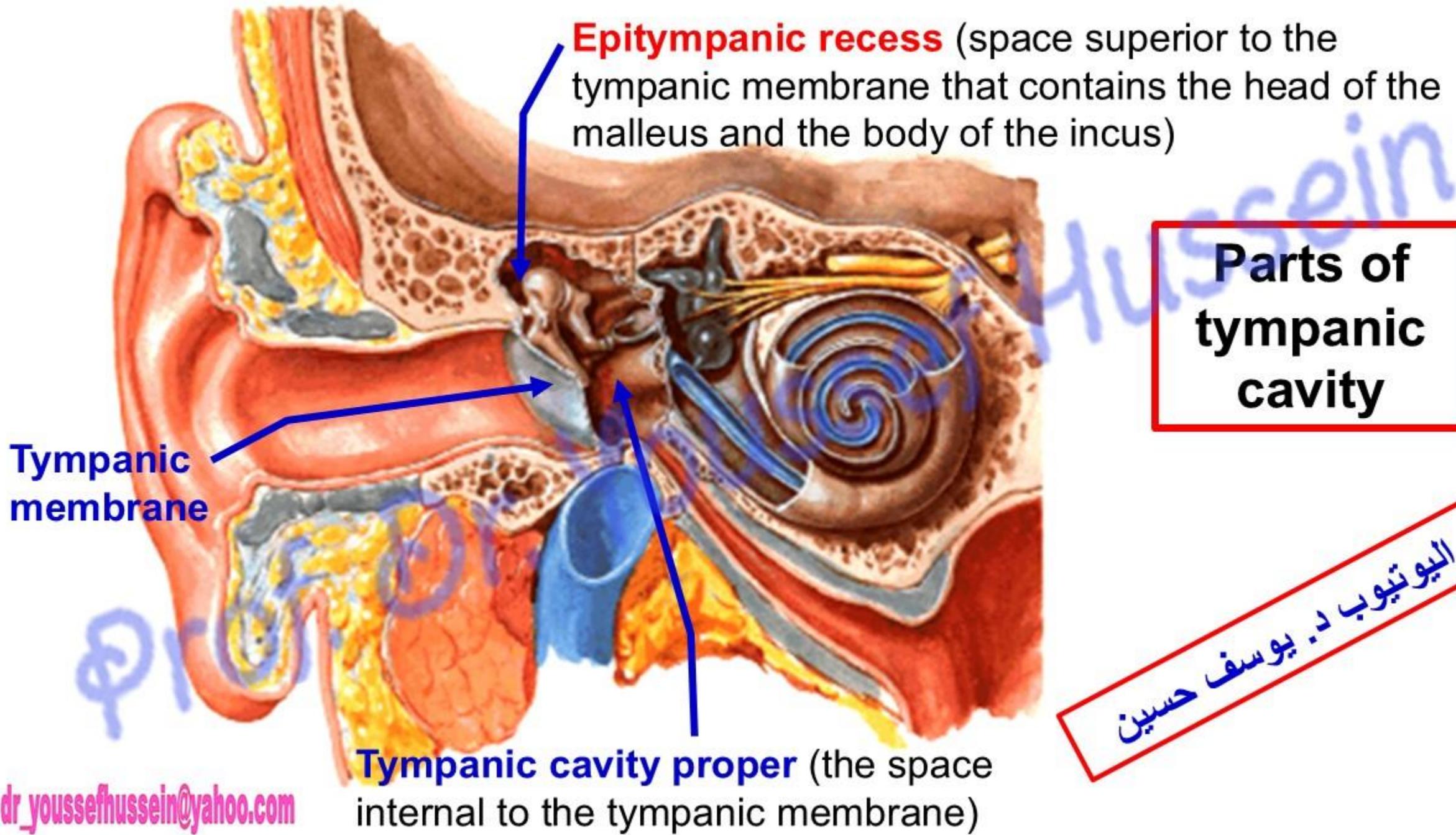
Nasopharynx

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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Epitympanic recess (space superior to the tympanic membrane that contains the head of the malleus and the body of the incus)

Parts of tympanic cavity

Tympanic membrane

Tympanic cavity proper (the space internal to the tympanic membrane)

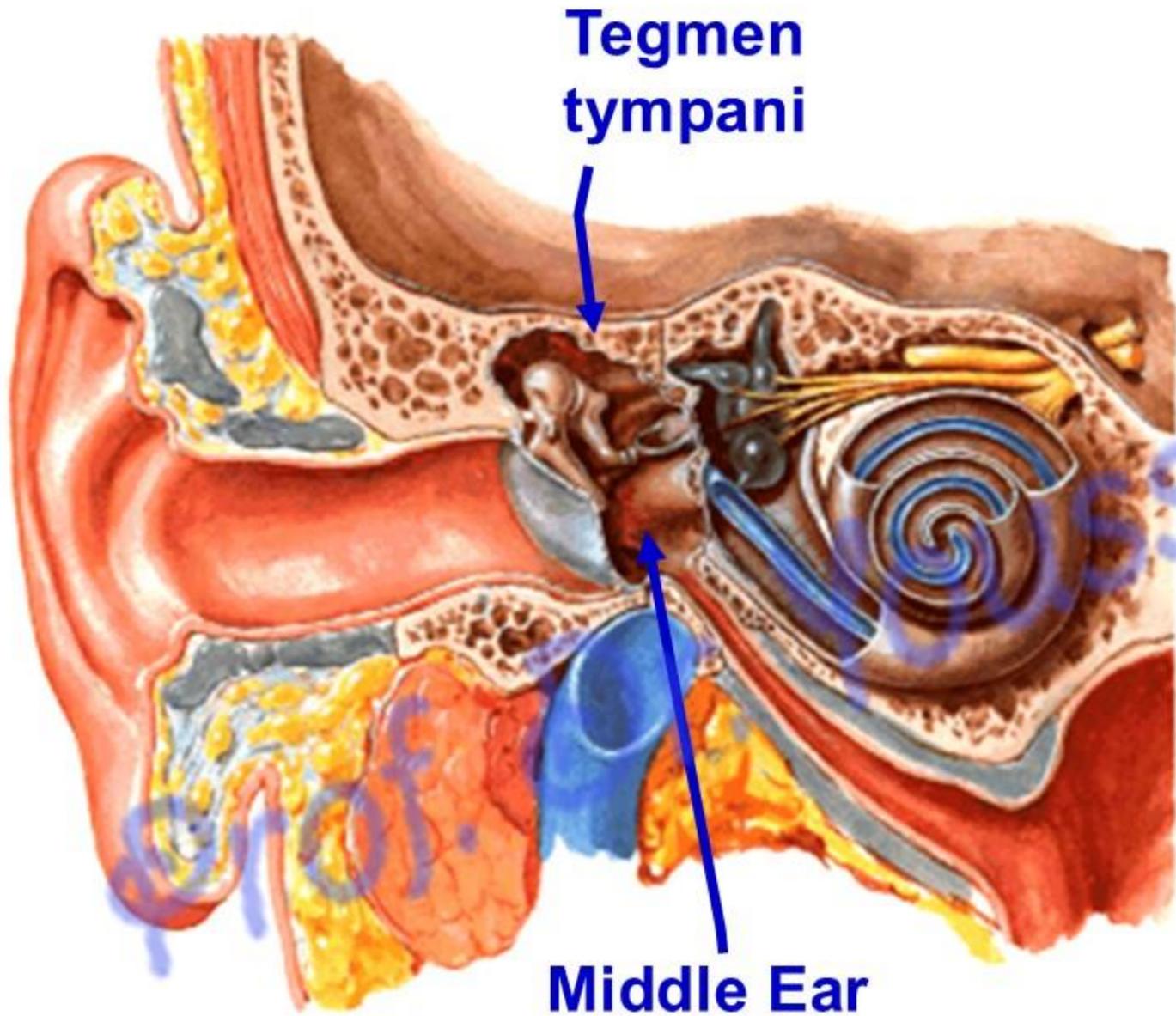
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Boundaries of Middle East

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**Tegmen
tympani**

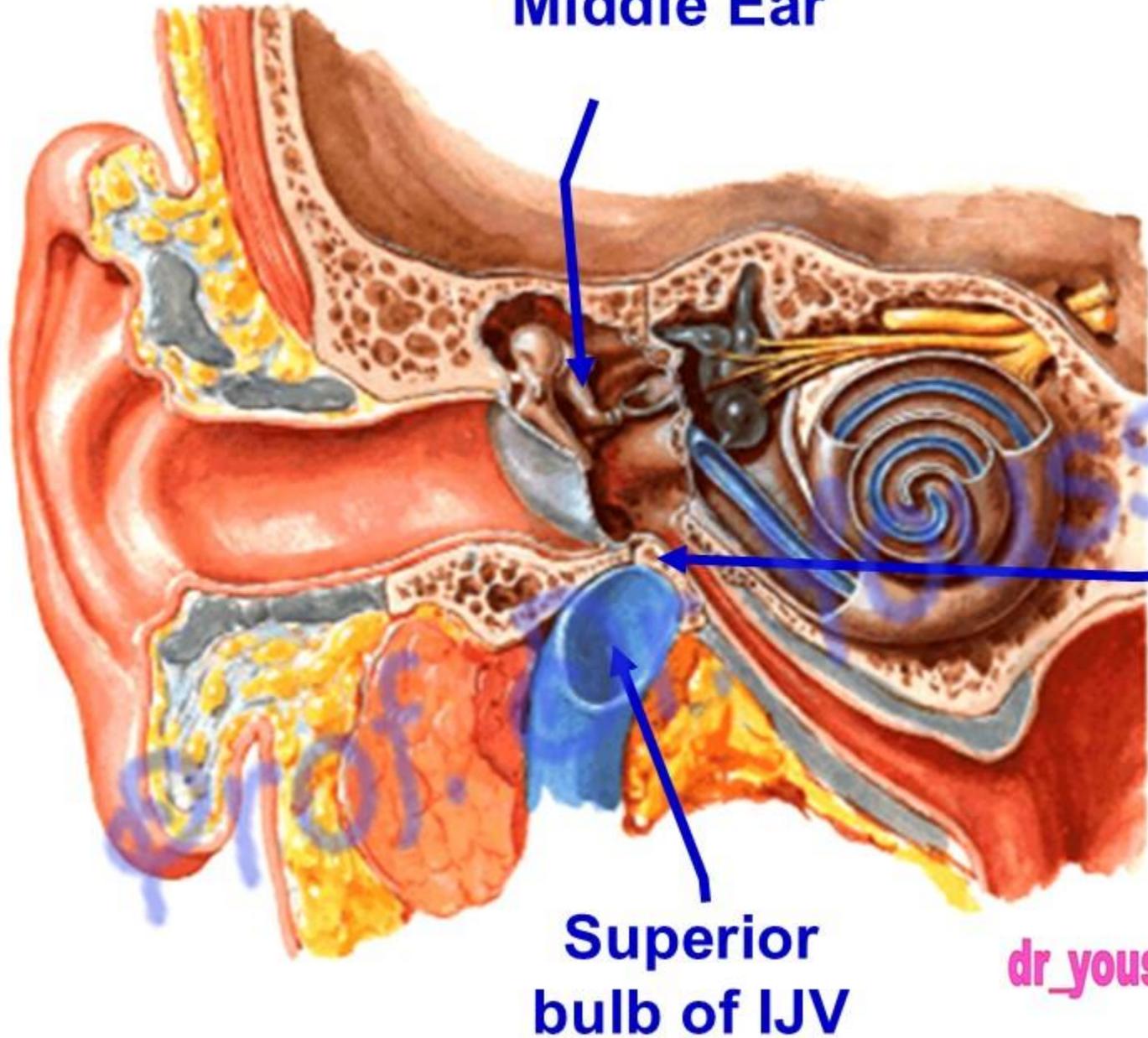
Middle Ear

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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)

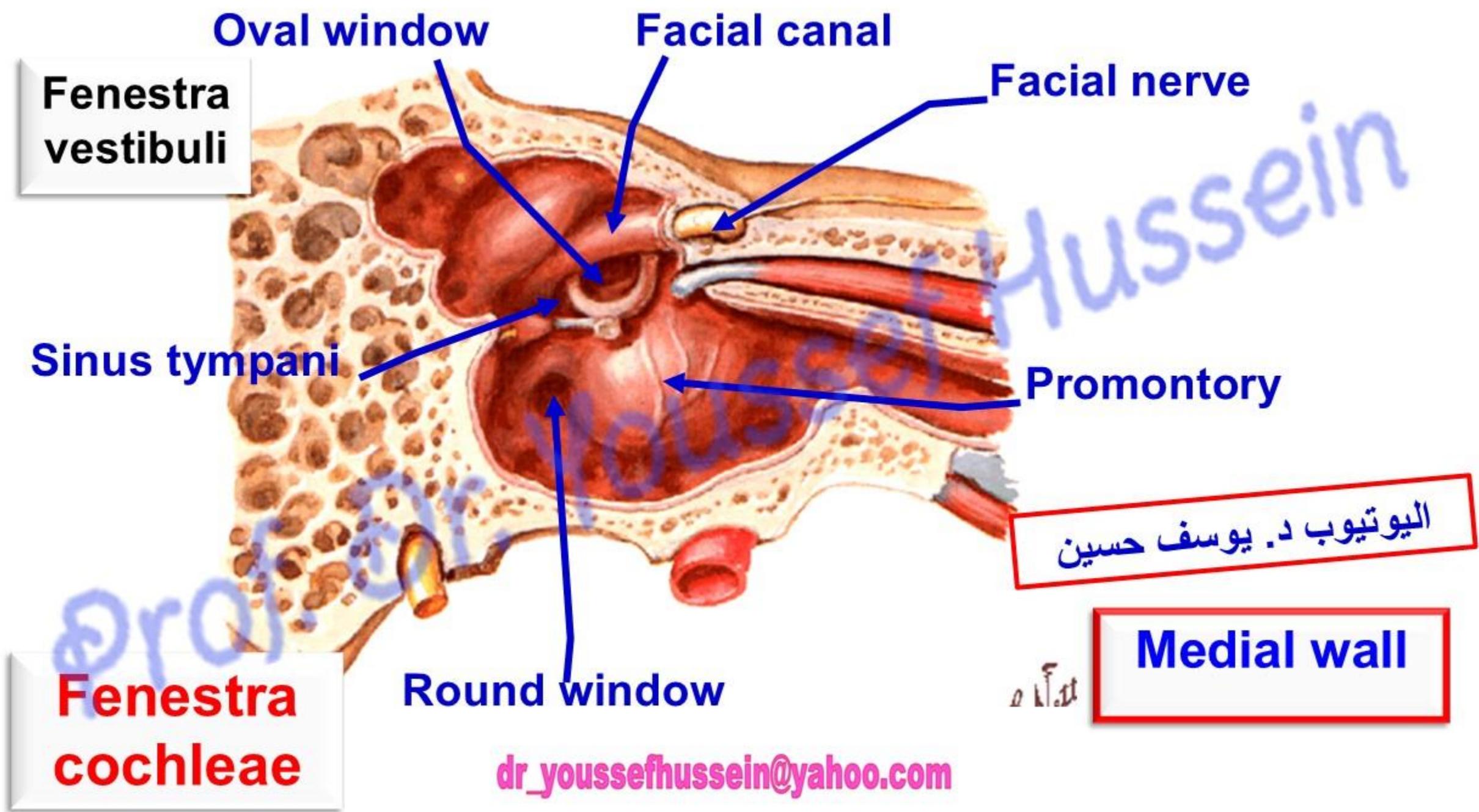
- It is formed by a **thin plate of bone** which separates it from superior bulb of internal jugular vein.
- It is **pierced by tympanic branch of glossopharyngeal nerve.**

Thin plate of bone

Superior bulb of IJV

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Fenestra vestibuli

Oval window

Facial canal

Facial nerve

Sinus tympani

Promontory

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Fenestra cochleae

Round window

Medial wall

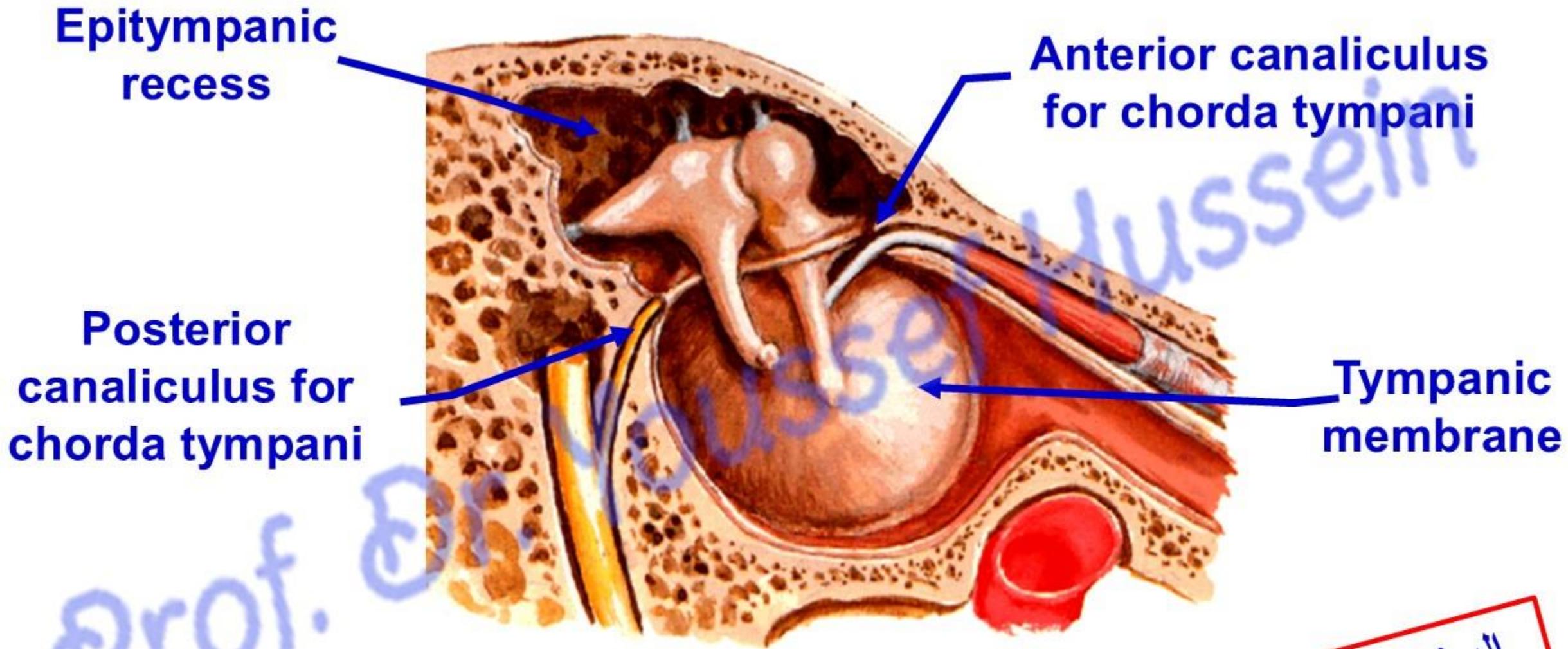
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- **Medial (labyrinthine) wall**

- 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.

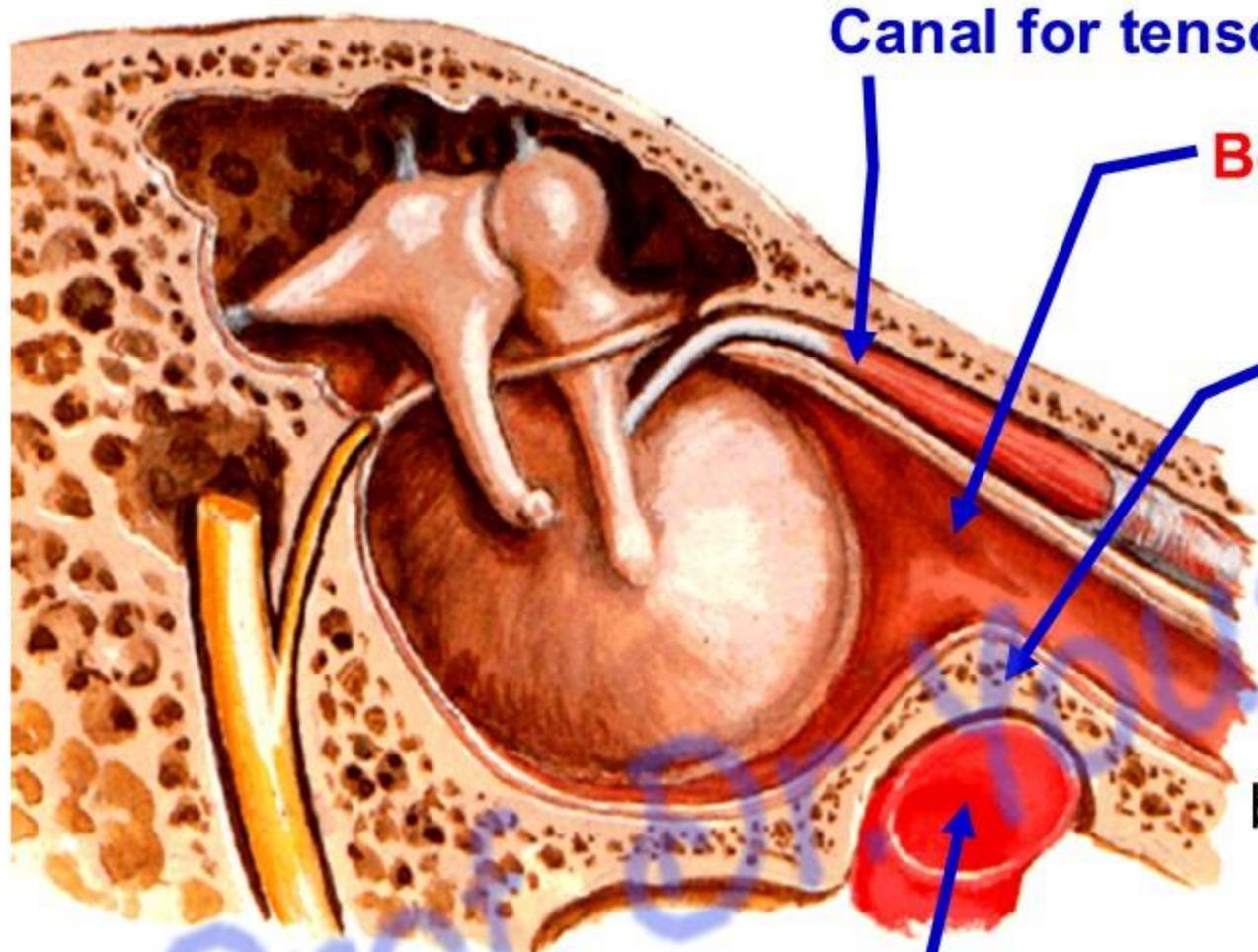
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Lateral wall

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Canal for tensor tympani M

Bony part of Auditory (Eustachian) tube

Thin plate of bone which separates cavity from ICA within carotid canal.

It is pierced by:

- a) **Caroticotympanic artery** (branch of internal carotid artery).
- b) **Caroticotympanic nerve** (sympathetic plexus around internal carotid artery).

Anterior wall

Internal carotid artery

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Opening to mastoid antrum

communicates with the epitympanic recess

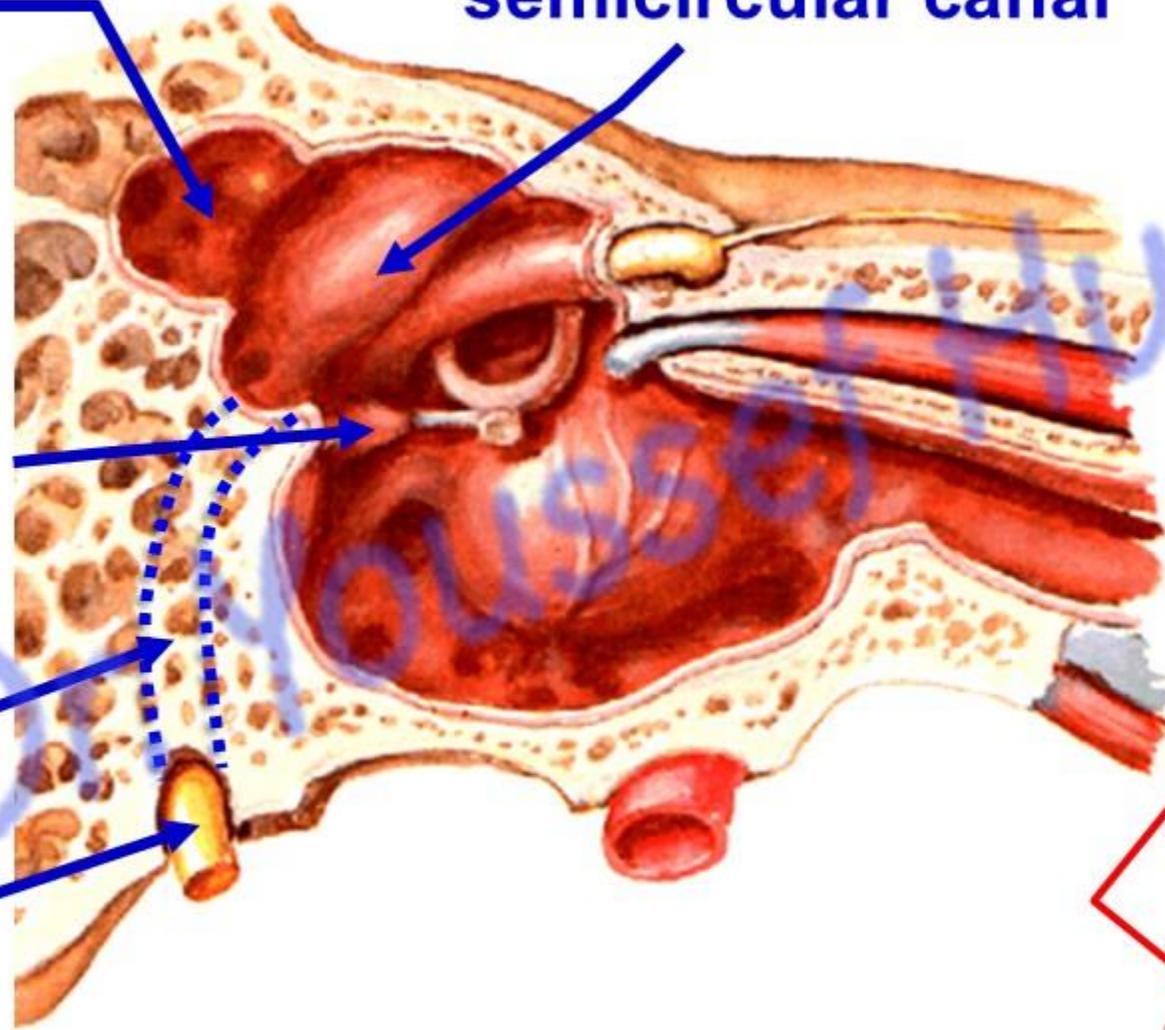
Pyramid containing stapedius muscle

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

Stapes
الركاب

Pyramidalis M

- **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.

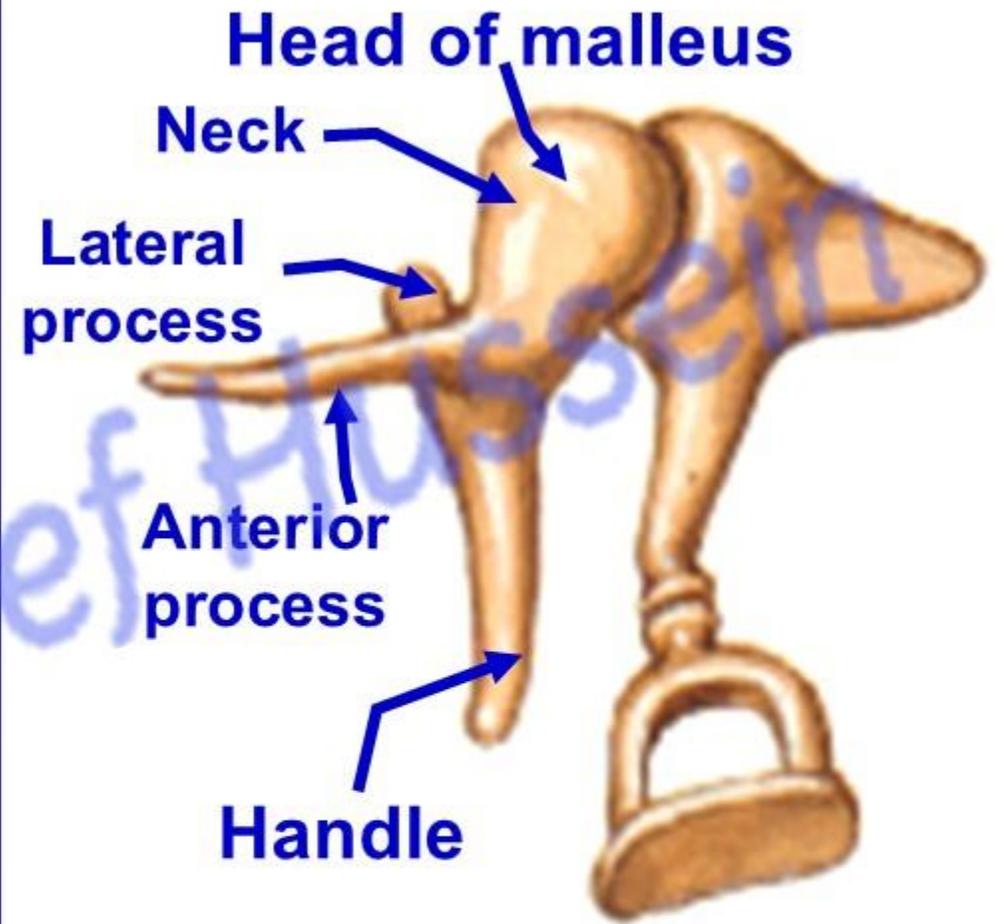
c- Handle is attached to inner surface of **tympanic membrane**.

* 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

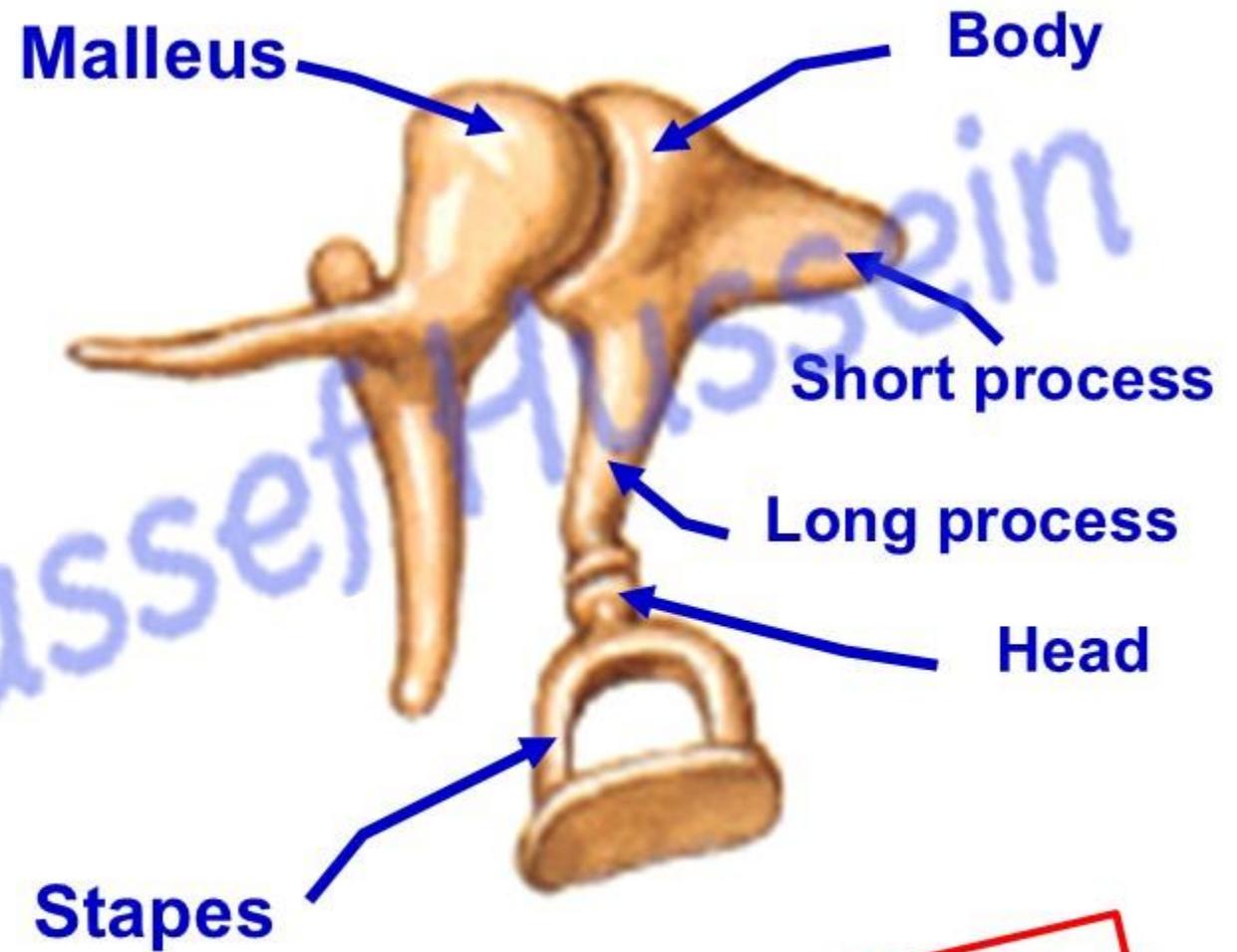
- It is anvil-like

* 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

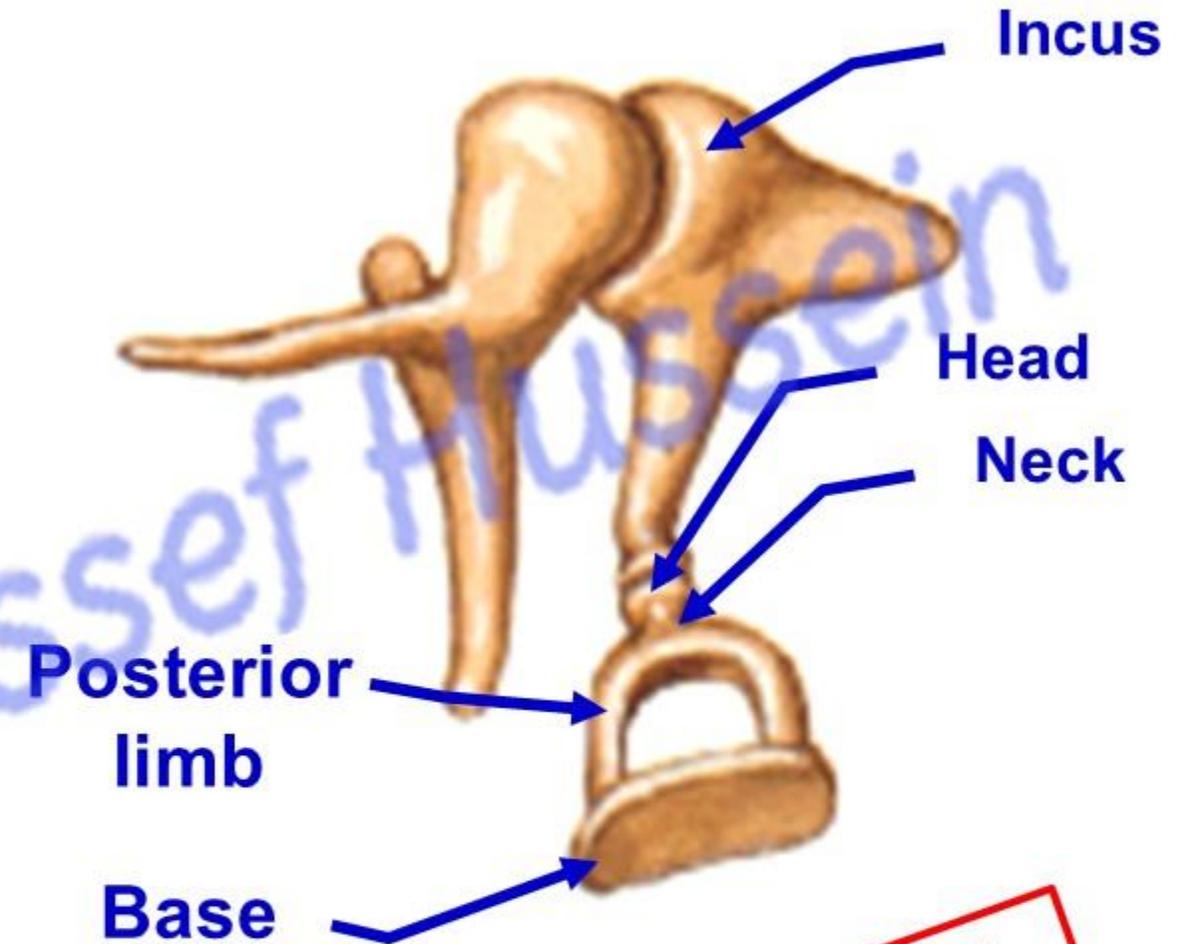
- It is stirrup- like.
- It is formed of.

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

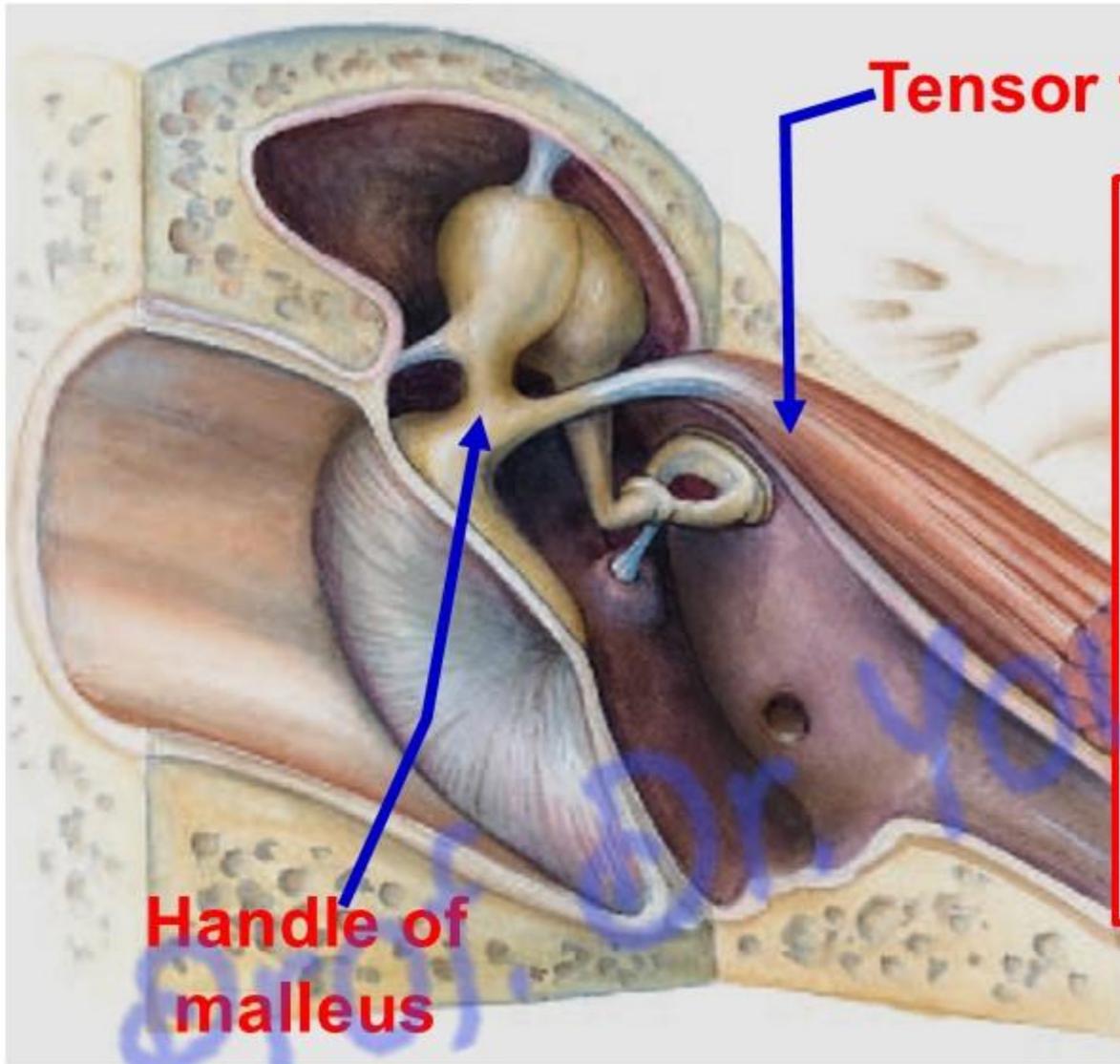
* **Neck** is a narrow part below head, revolved insertion of stapedius muscle.

* **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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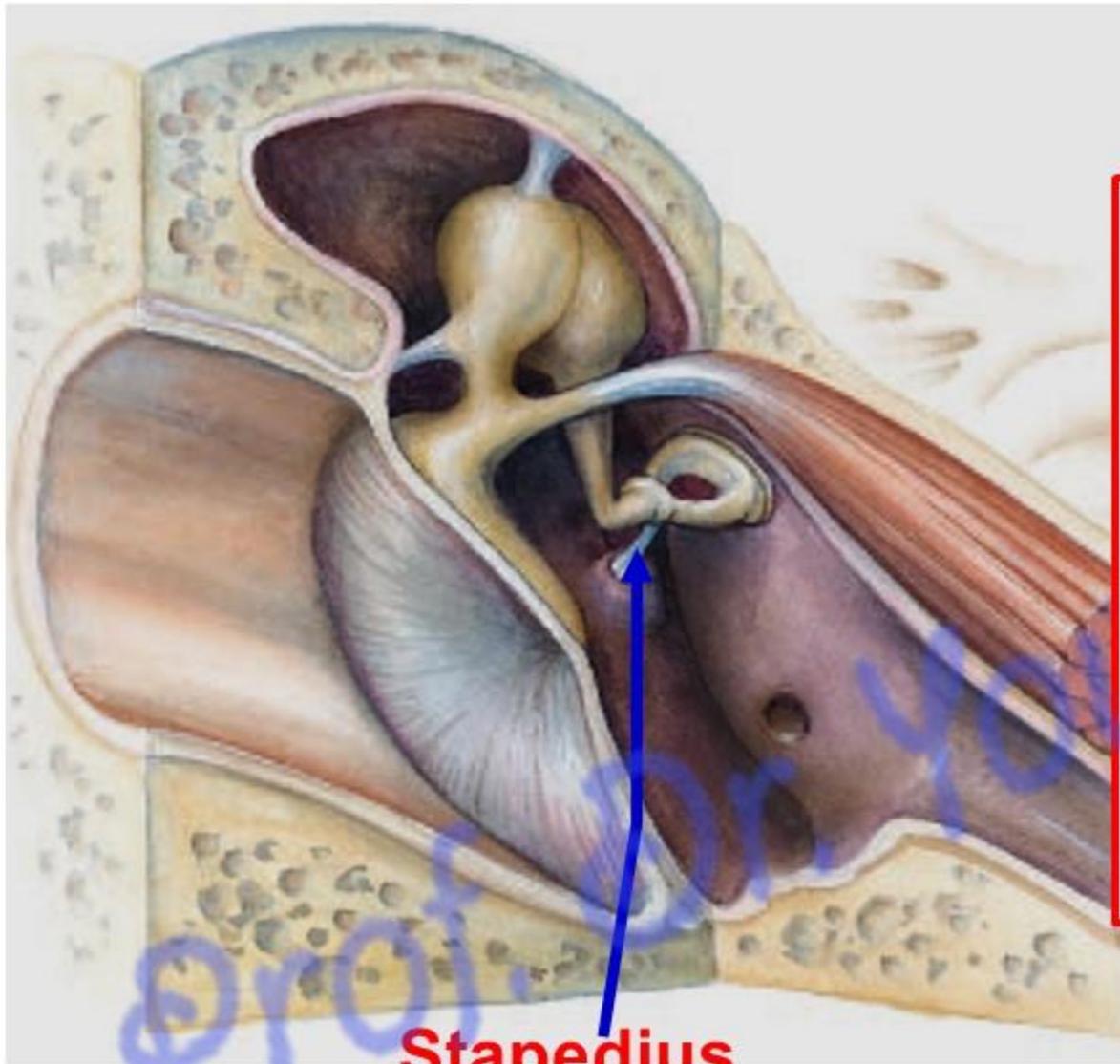


Tensor tympani M

Handle of malleus

- * **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

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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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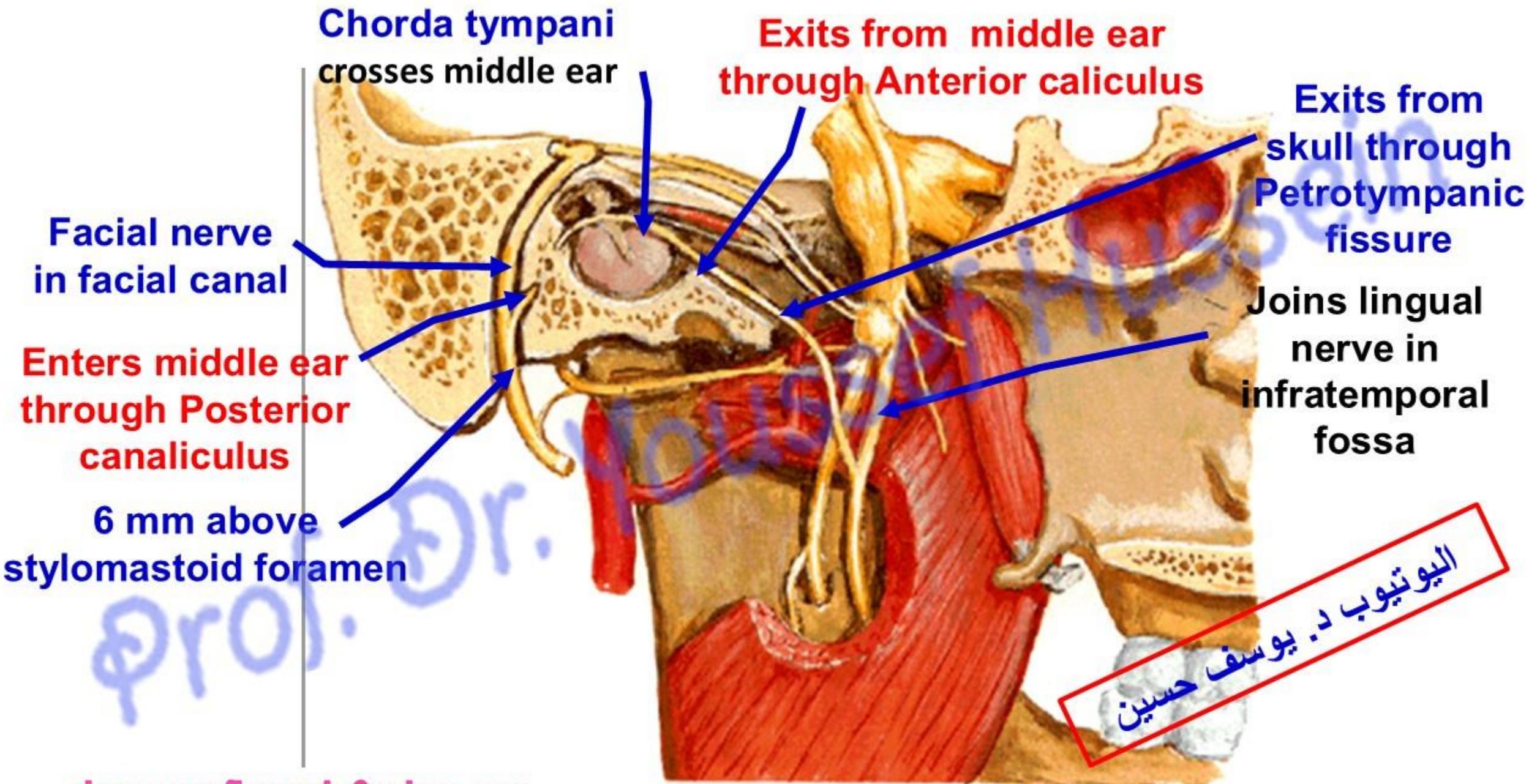
EUSTACHEAN TUBE or Auditory tube

- 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.



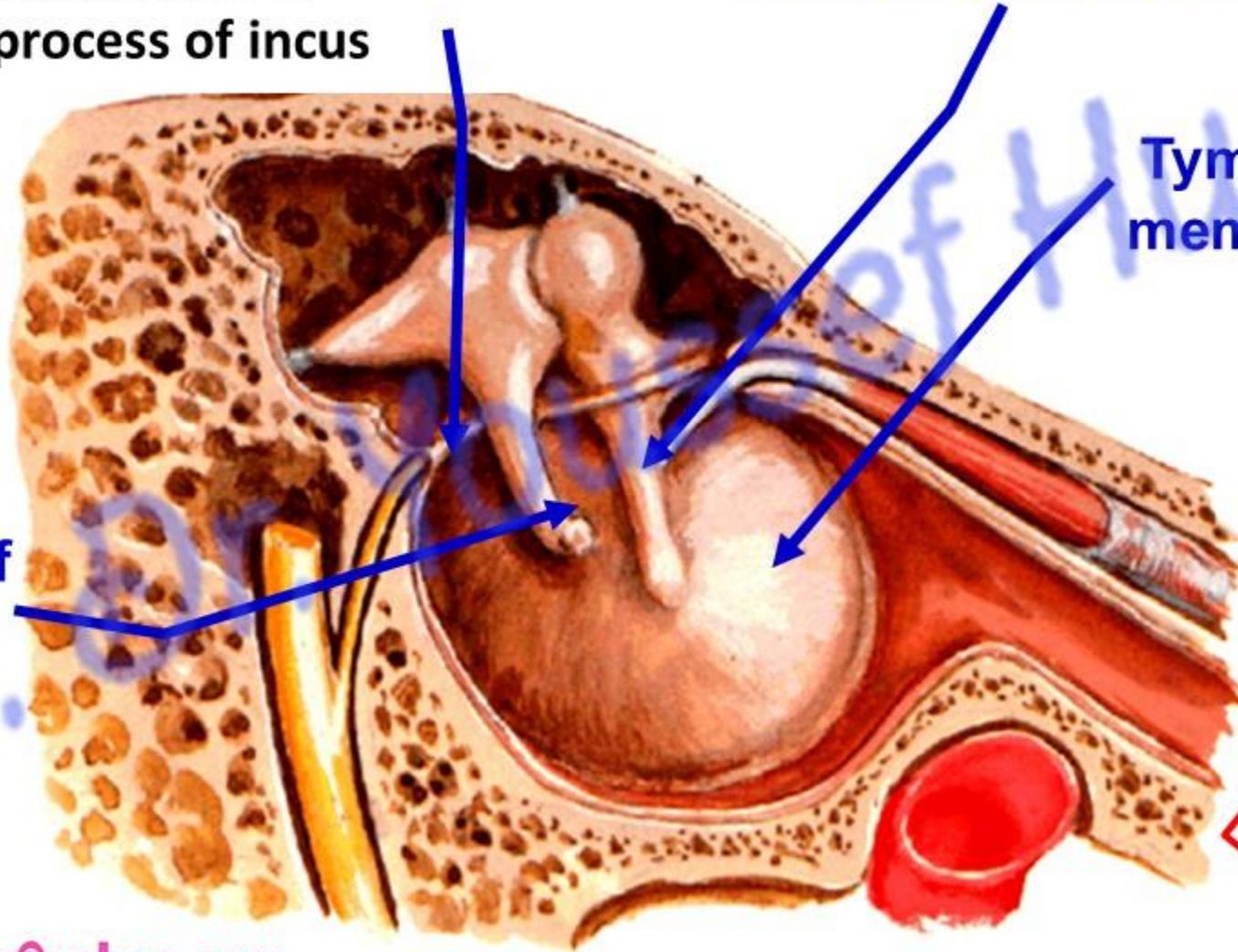
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Chorda tympani crosses tympanic cavity , related to tympanic membrane, between handle of malleus and long process of incus

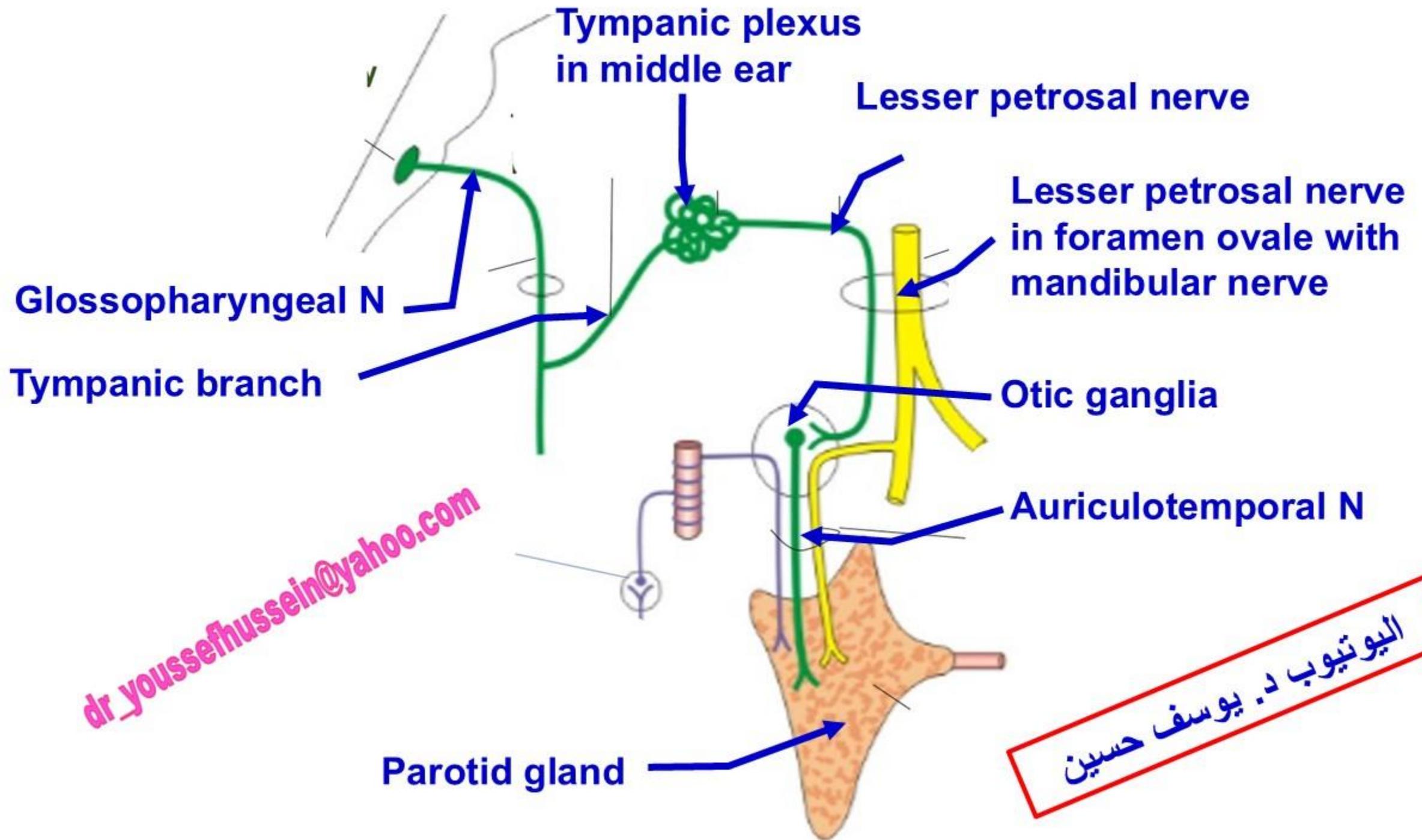
Handle of malleus

Tympanic membrane

Long process of incus



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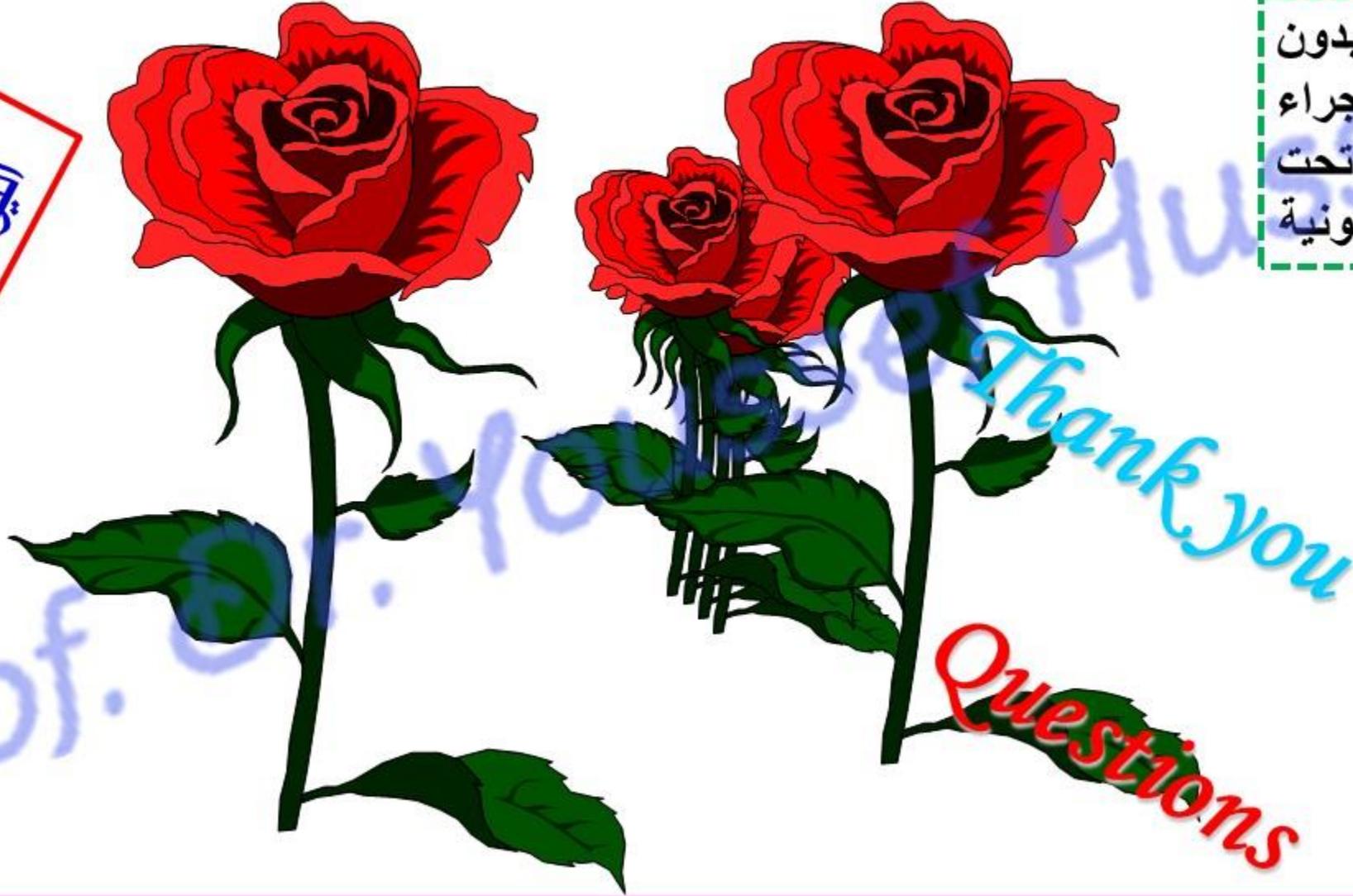
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