

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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الصقائف

Auricle

in order to collect
Auditory waves.

Helix

Scaphoid fossa

Tragus

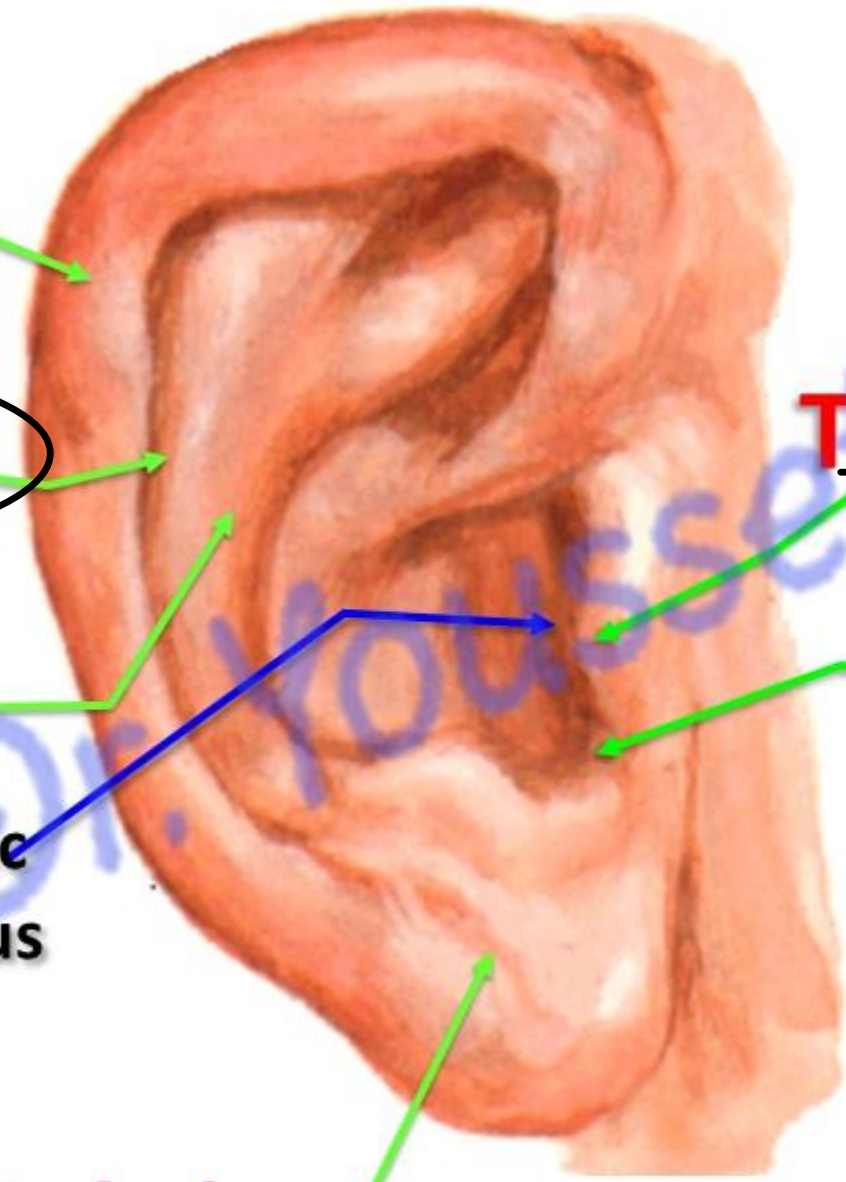
Antihelix

External acoustic
(auditory) meatus

Antitragus

Lobule

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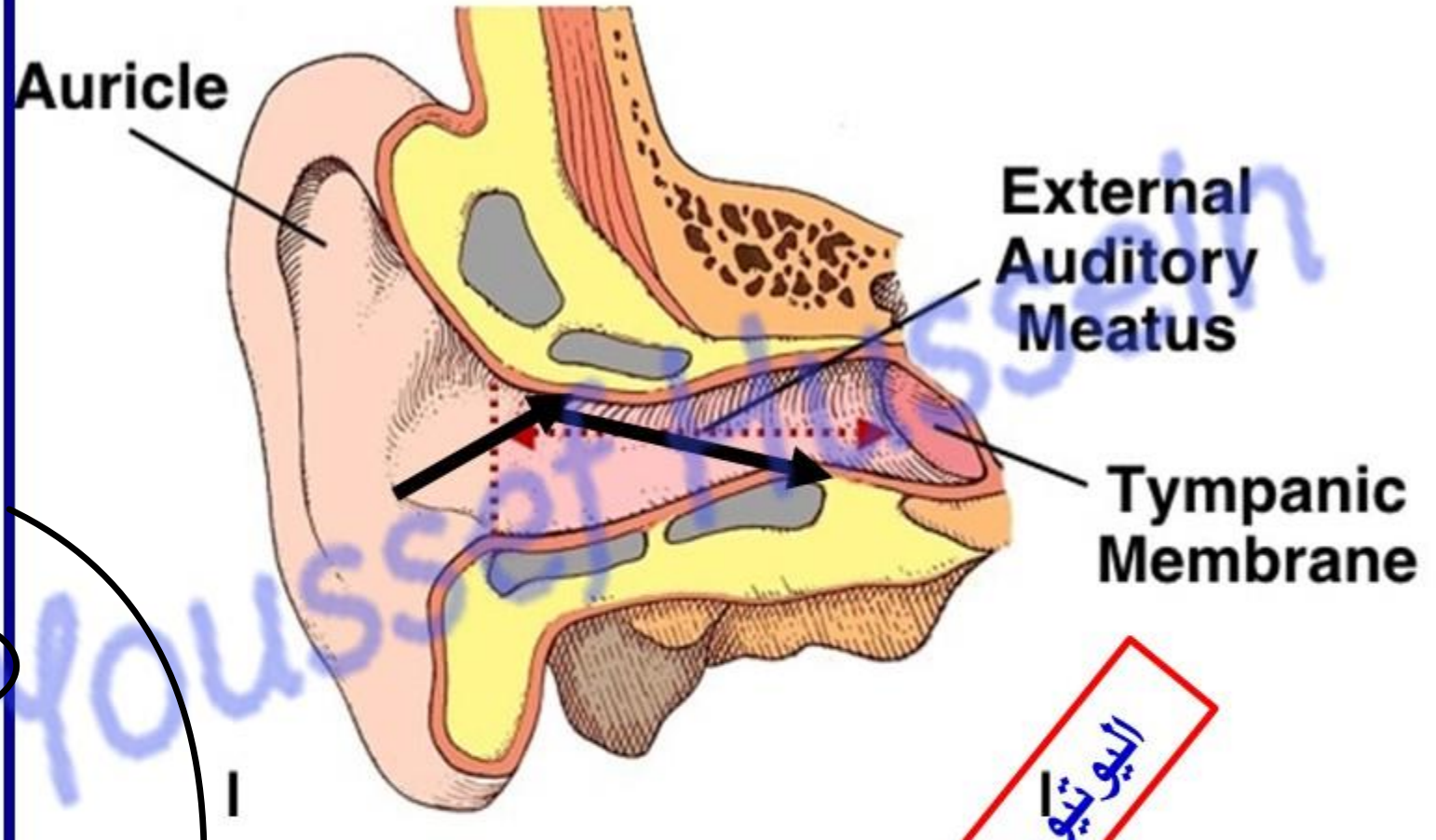


- **External auditory meatus**
- **Length:** about one inch
- **Parts:**

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.



Angle to trap any
 Foreign Body.
 post. divi of CN 5.

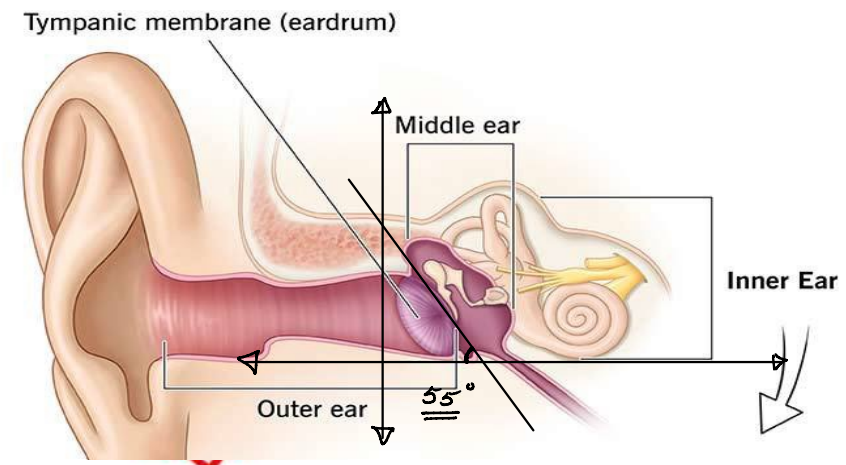
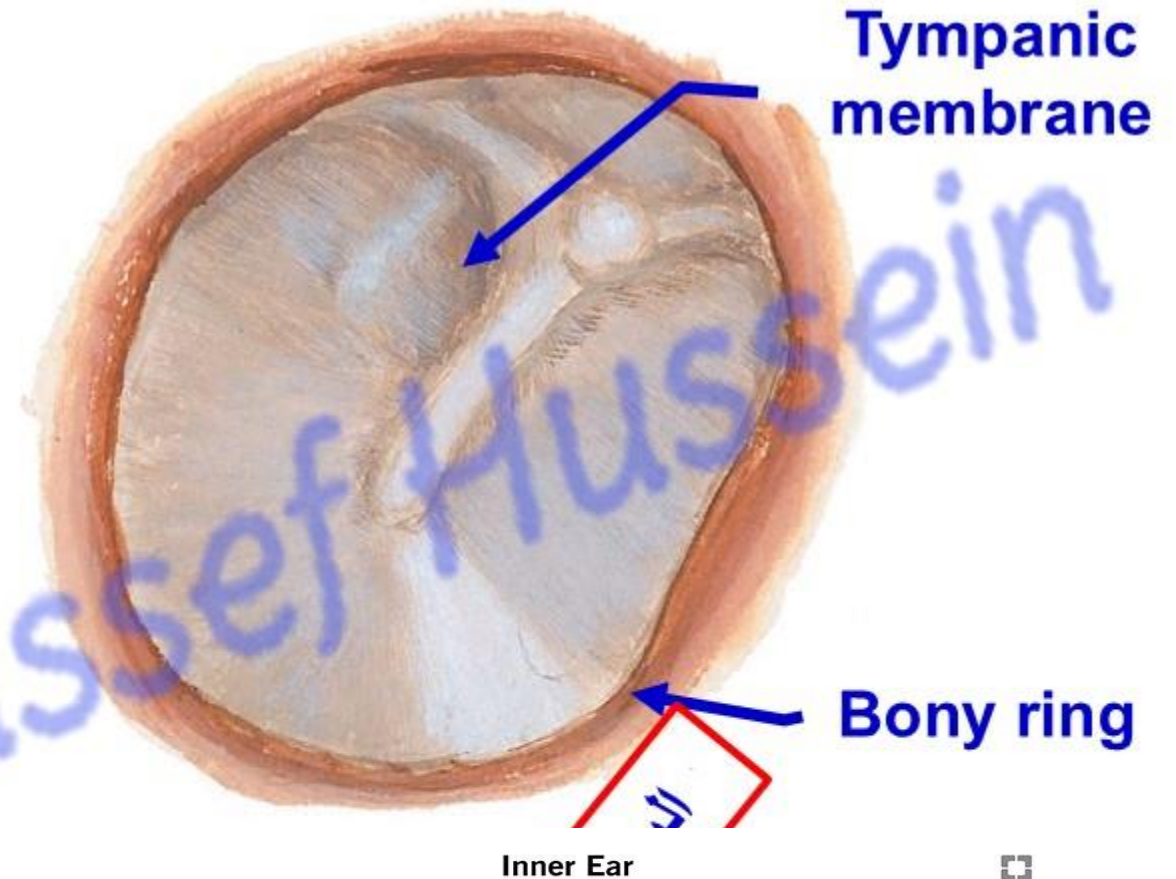
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- **Ear drum (tympanic membrane)**

■ **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;**

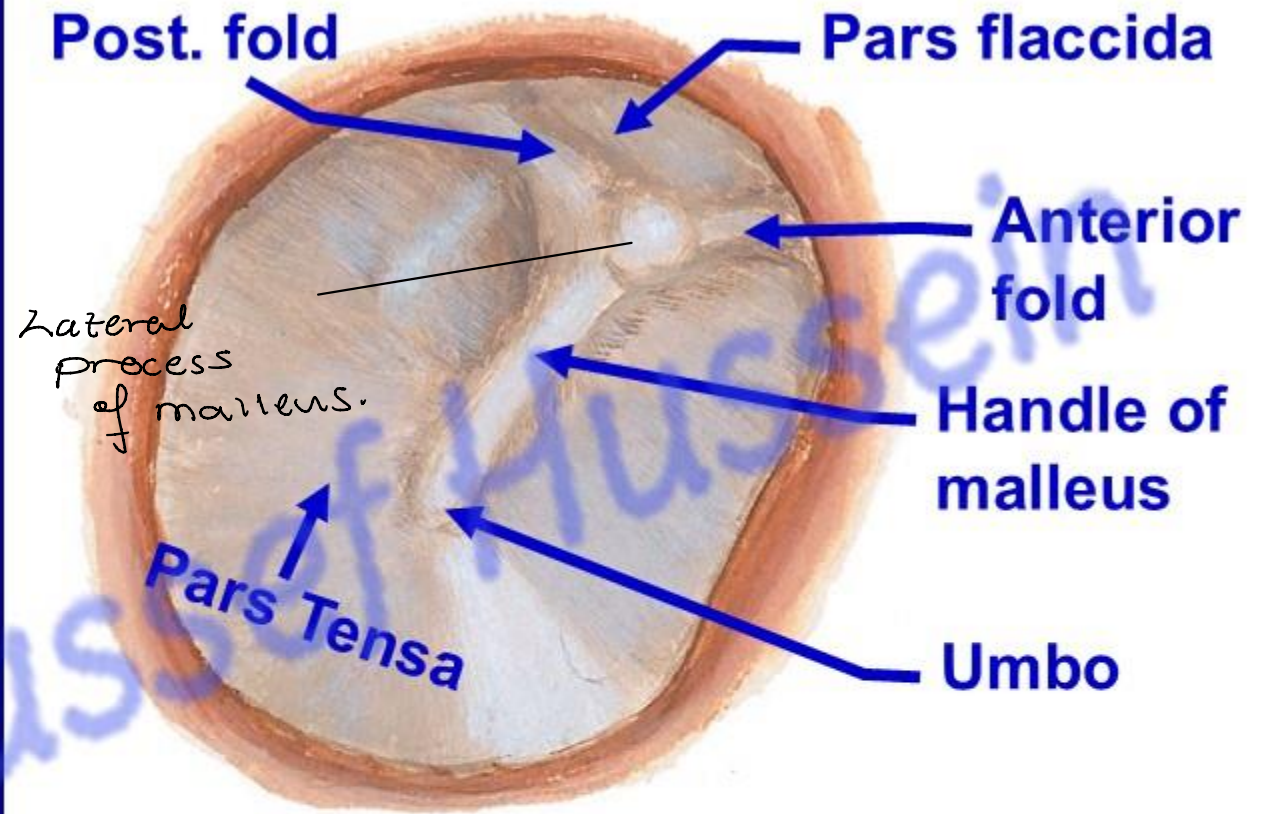
1. **Outer surface, concave.** The most depressed part called **umbo**.
2. **Inner surface, convex,** gives attachment to **handle of malleus**. with tensor tympani muscle.

**** 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. *Perforation - common.*

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

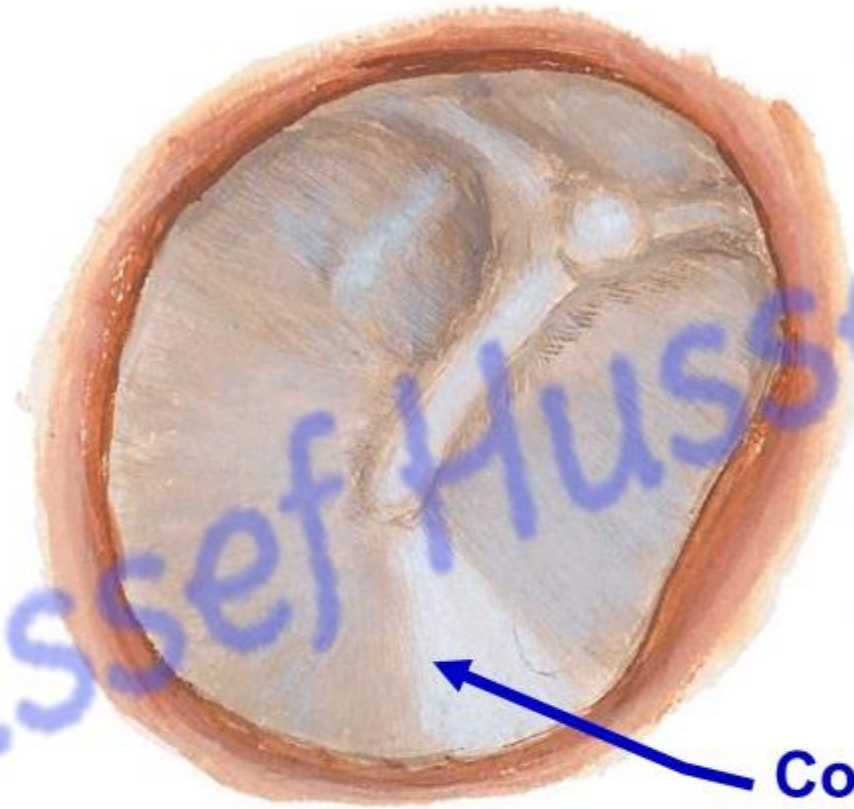


⊙ **Tympanic membrane perforation** (**Pars flaccida**) is caused by **Otitis media** (middle ear infection) Or **trauma**, **Rapid change in pressure** with unpressurized airplane.

⊙ It heals within a few weeks without treatment. Sometimes needs surgical repair.

↳ with chronic otitis media.

- 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

Tense the Auricle to Release the Angle

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Middle Ear

الاذن الأوسط

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Middle ear laying inside
petrous part of temporal bone

*The most important
Bone among skull Bones
due its content
Middle ear, ICA is related
inner to internal Jugular
Vein.*

Inner ear

Auditory tube

*in children, it is short, straight
in Adult, it take an angle.*

Nasopharynx

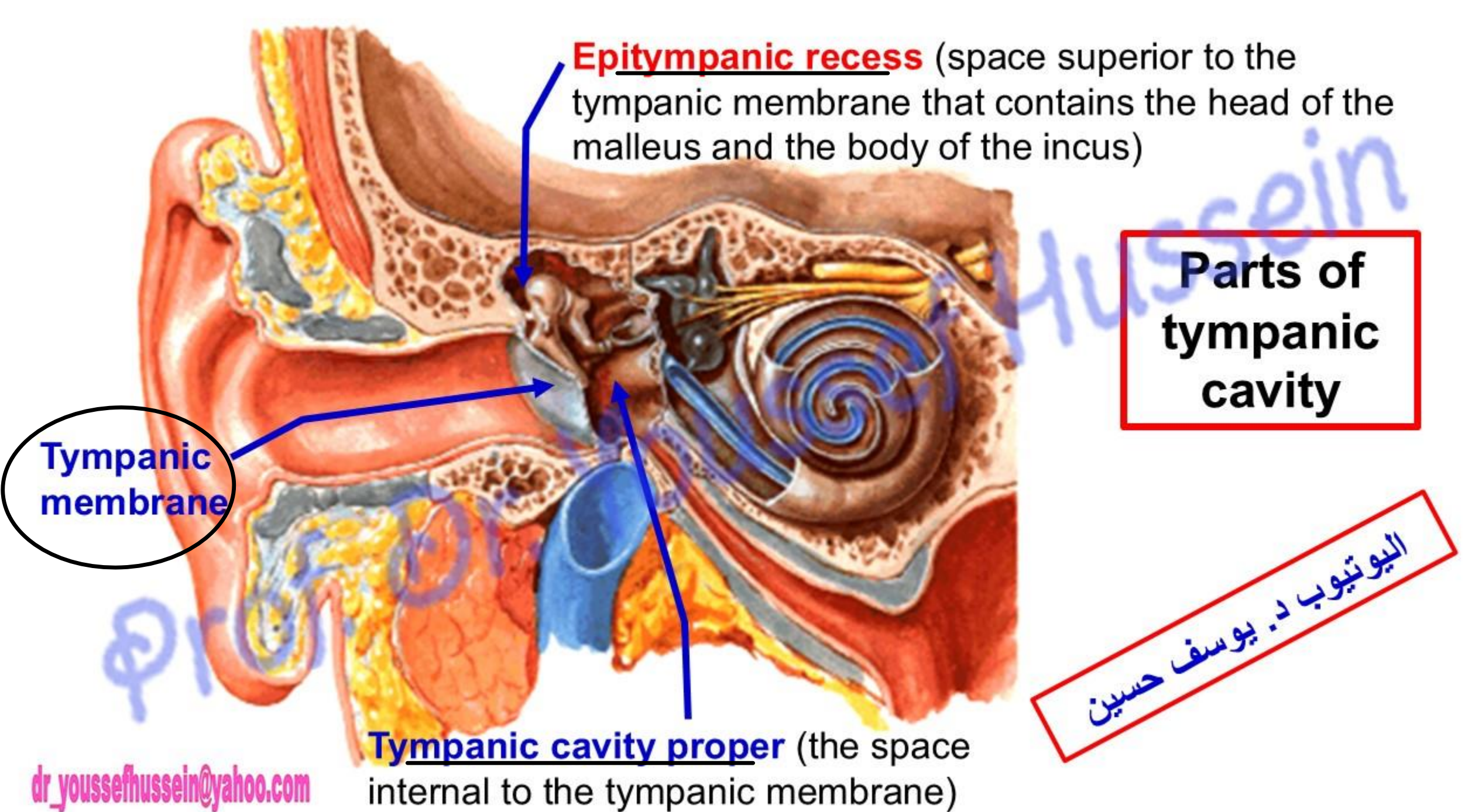
External
acoustic meatus

Tympanic
membrane

▪ **Communications;**

- **Anteriorly,** with the **nasopharynx** through the **auditory tube.**

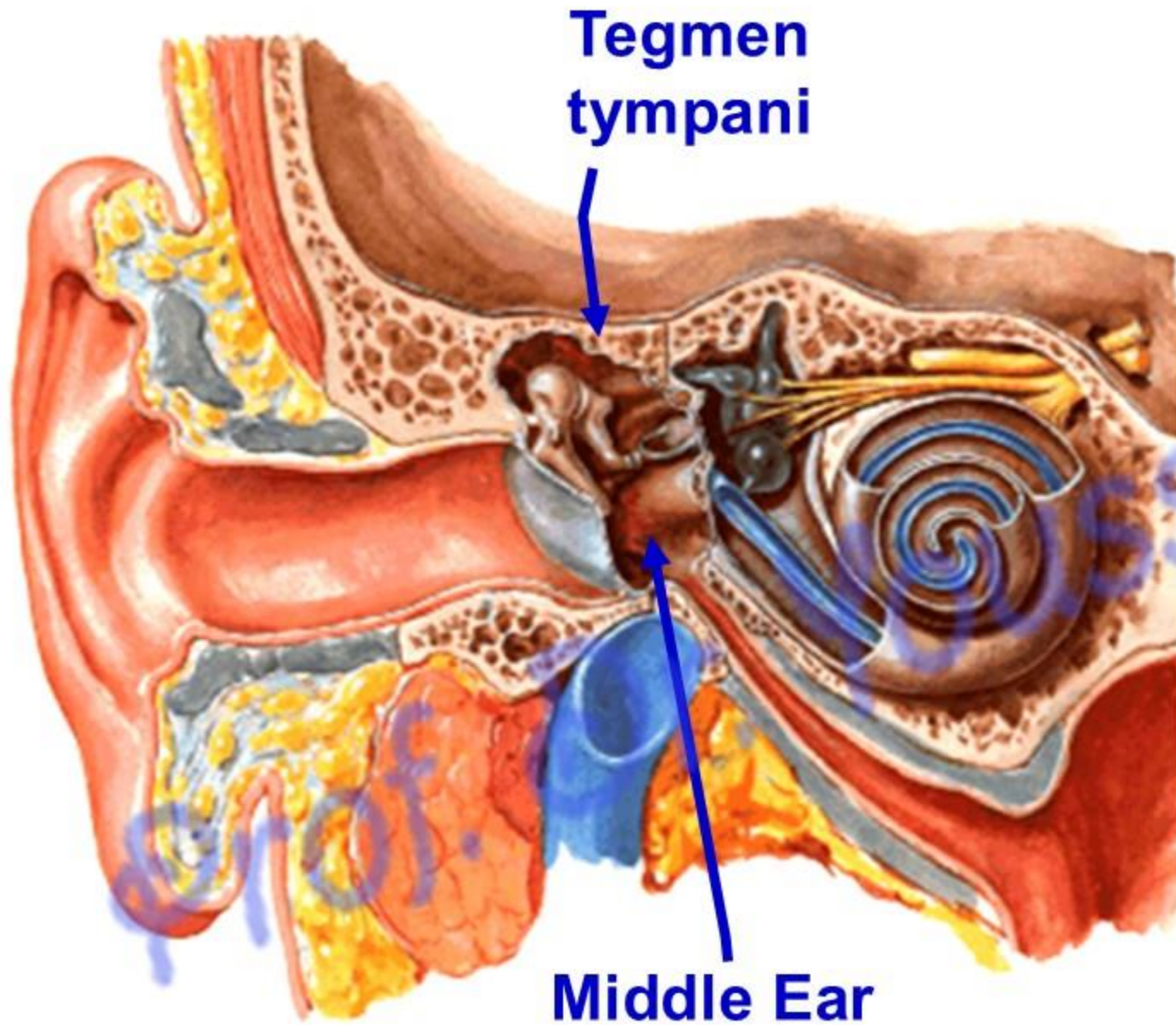
- **Posteriorly** With the **mastoid air cells** through the **mastoid antrum.**



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Boundaries of Middle East

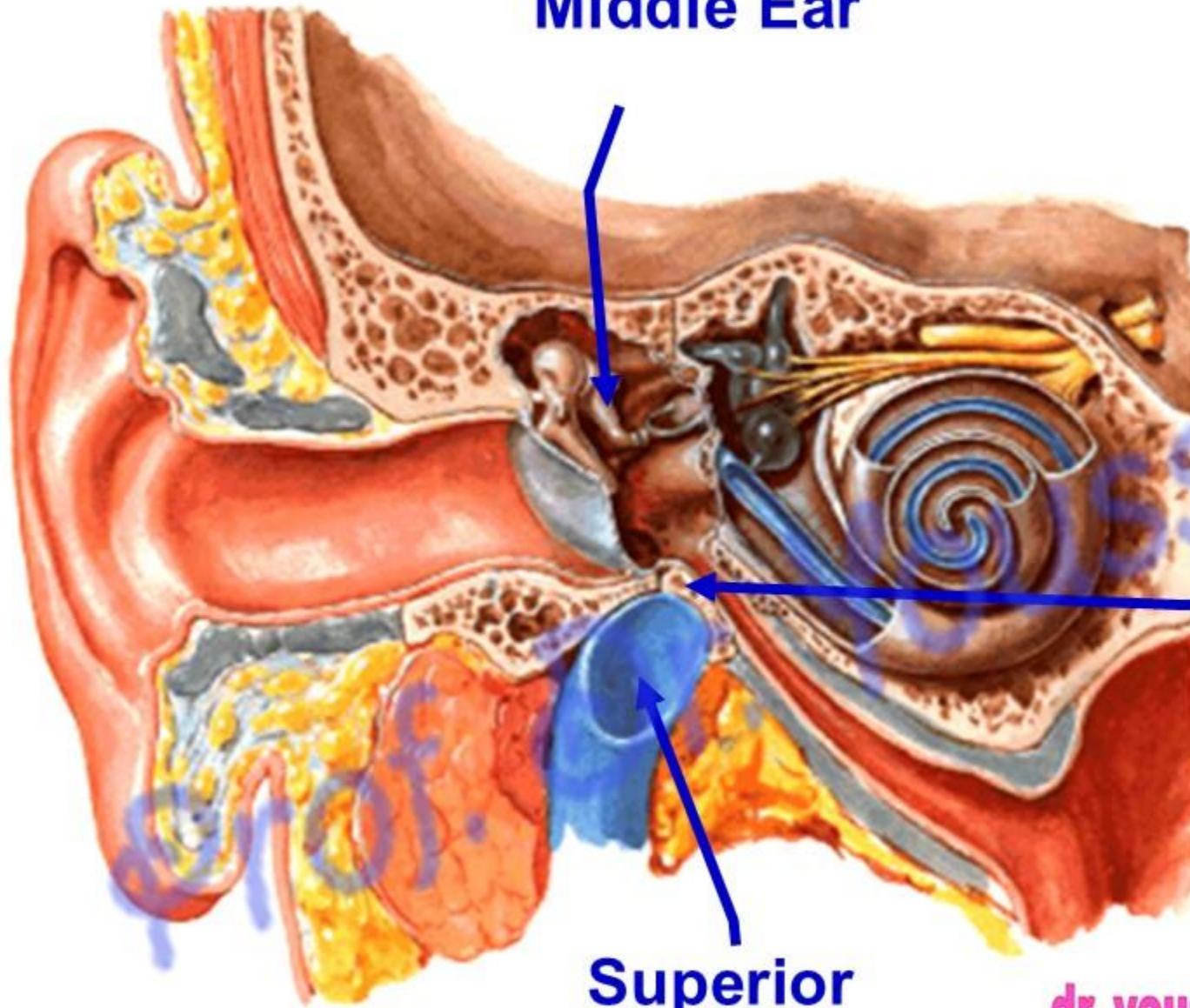
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- **Roof (tegmental wall)**
- It is formed by a thin plate of the petrous part of the temporal bone (called **tegmen tympani**) which separates it from the middle cranial fossa.

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Middle Ear



Floor (jugular wall)

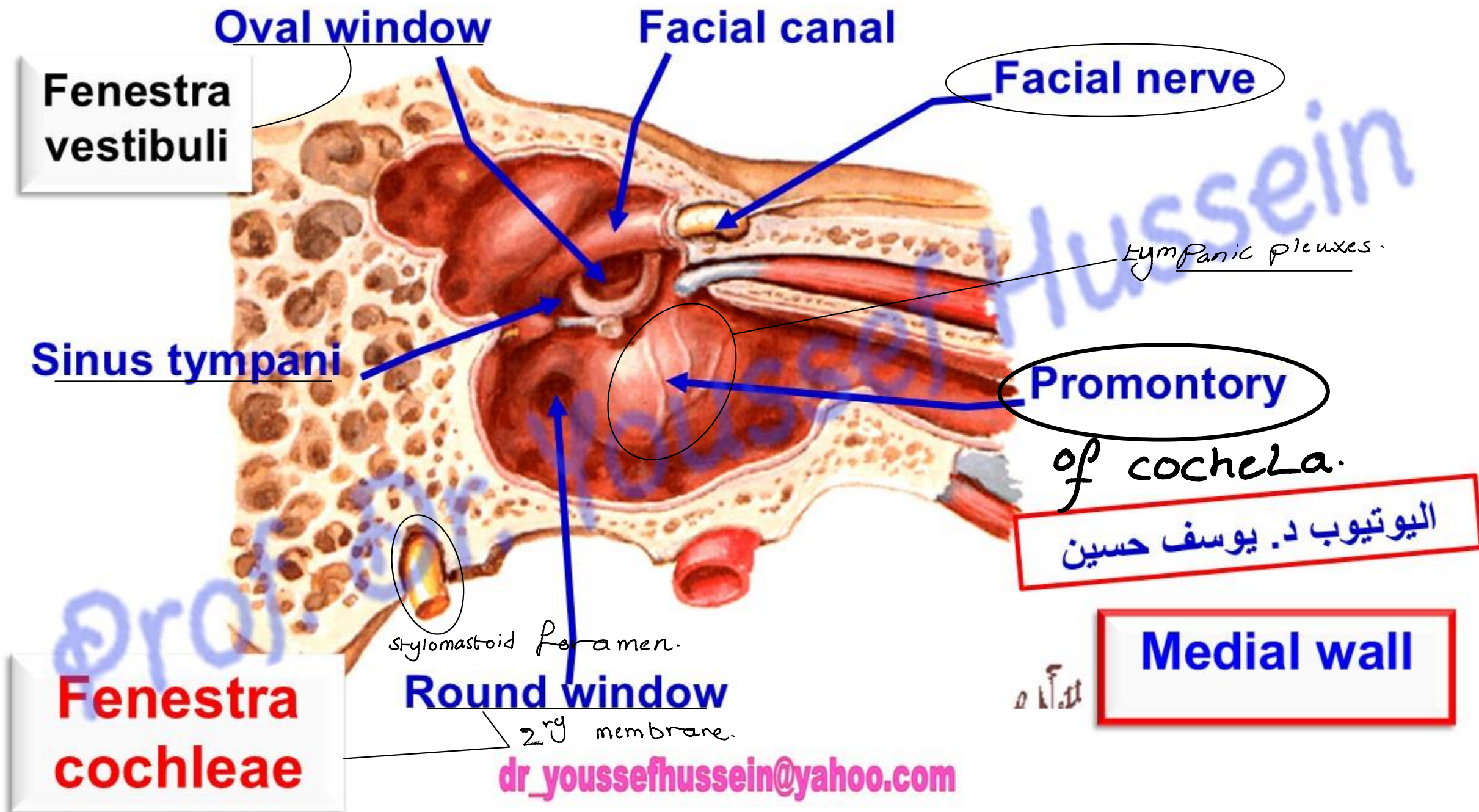
- It is formed by a **thin plate of bone** which separates it from superior bulb of internal jugular vein.
- It is **pierced by tympanic branch of glossopharyngeal nerve.**

Thin plate of bone

Superior bulb of IJV

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- **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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**Epitympanic
recess**

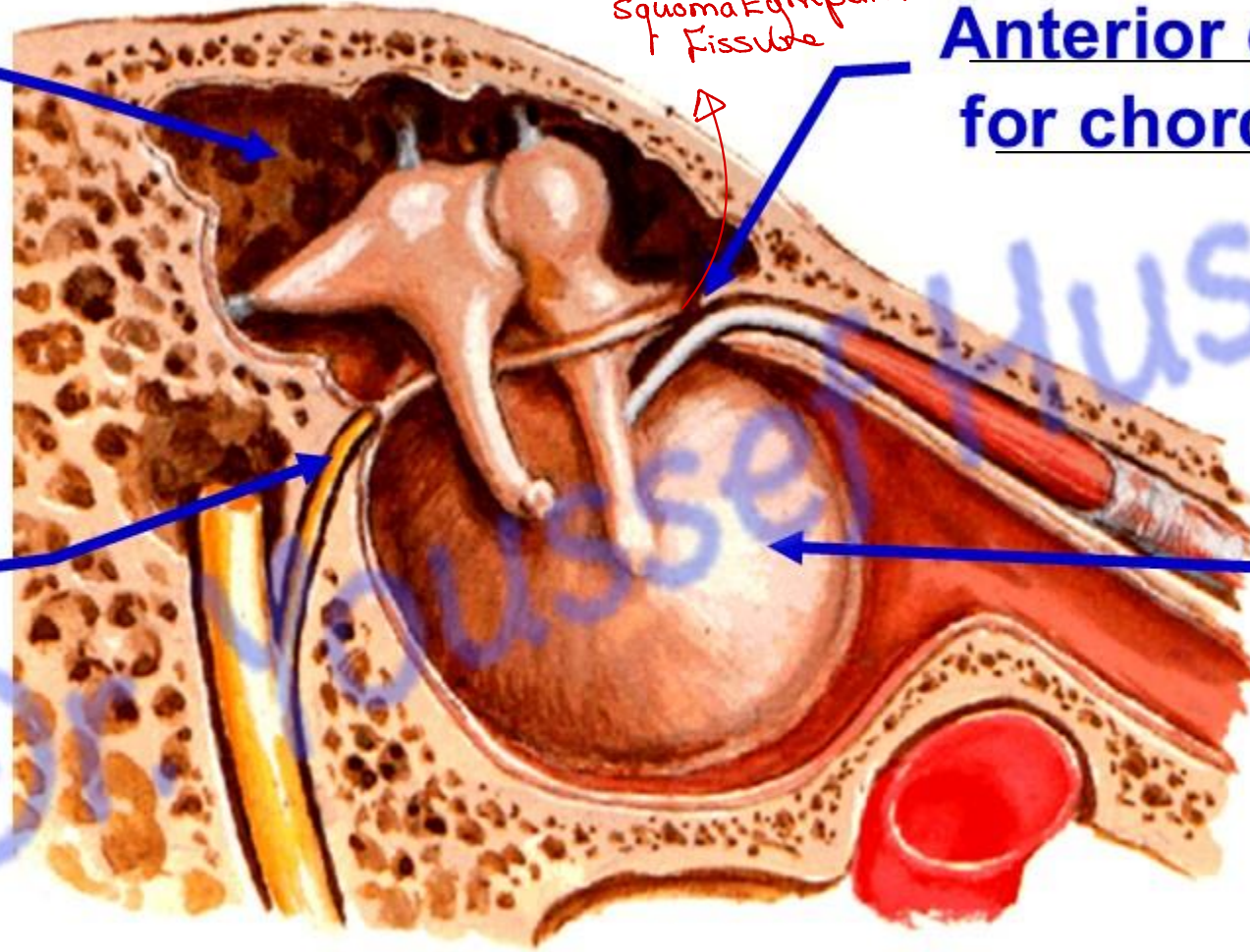
**Posterior
canaliculus for
chorda tympani**

Lateral wall

*Squamotympanic
Fissure*

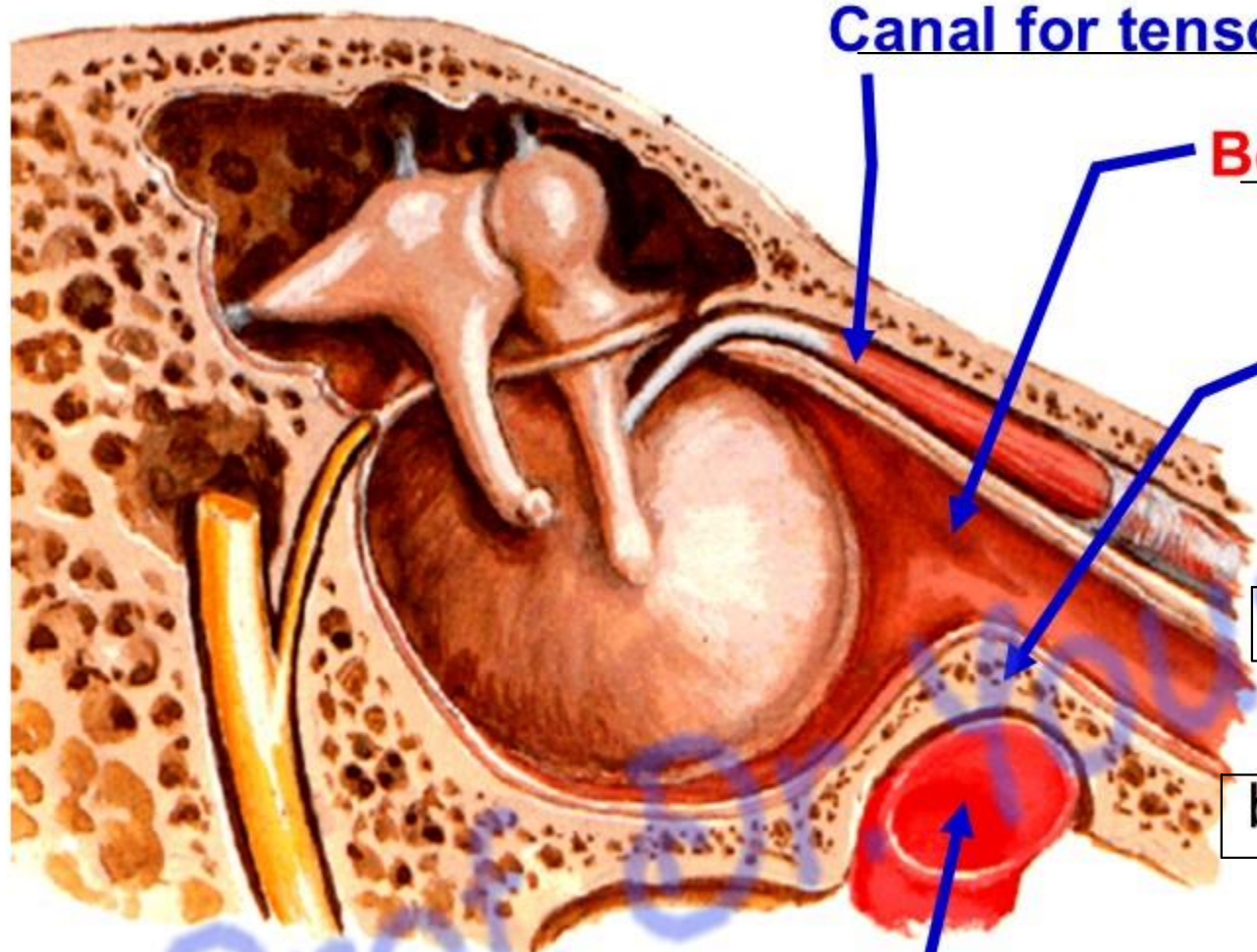
**Anterior canaliculus
for chorda tympani**

**Tympanic
membrane**



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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

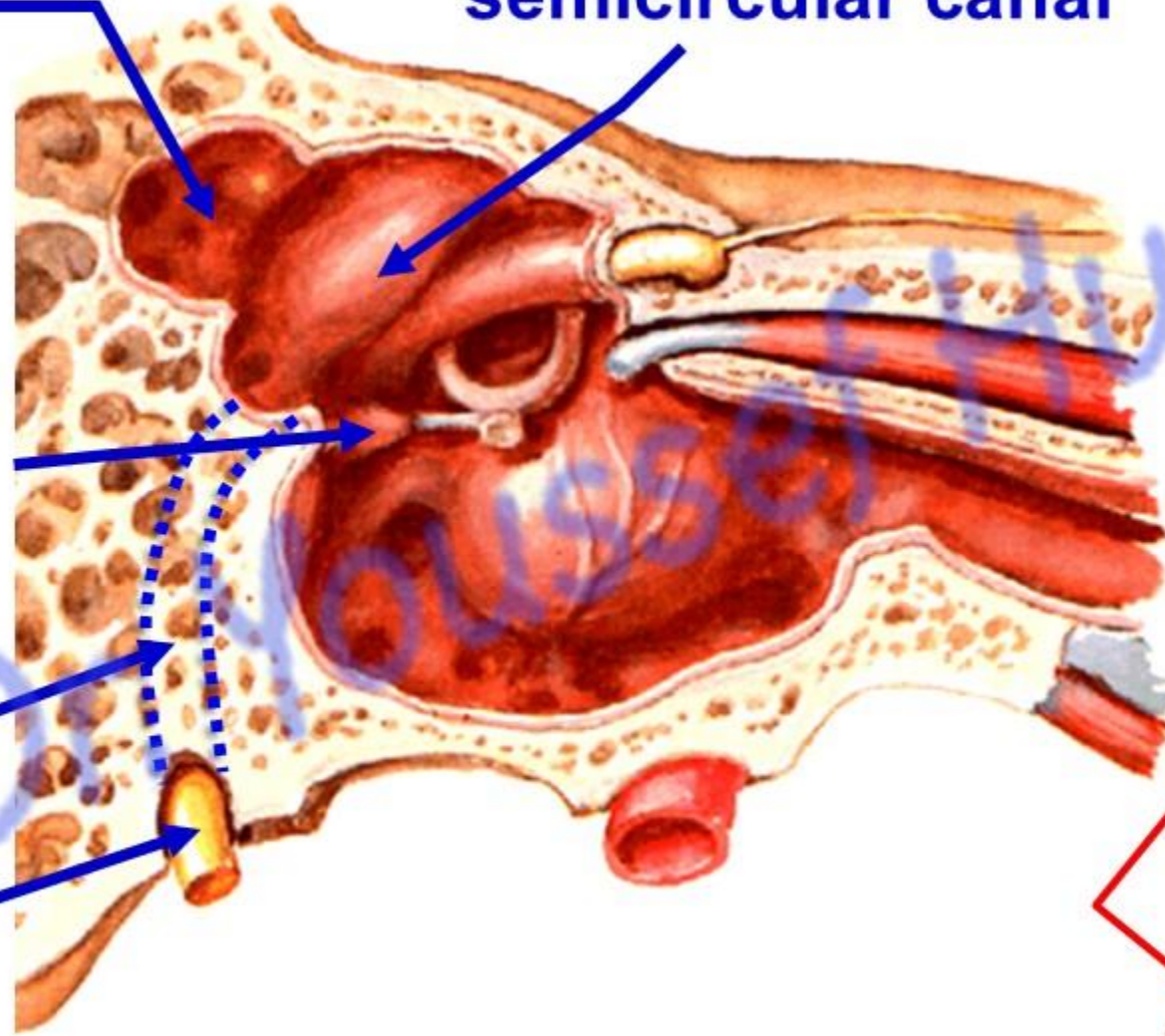
Pyramid containing stapedius muscle

Vertical part of facial canal

Facial nerve

Posterior wall

Elevation of lateral semicircular canal



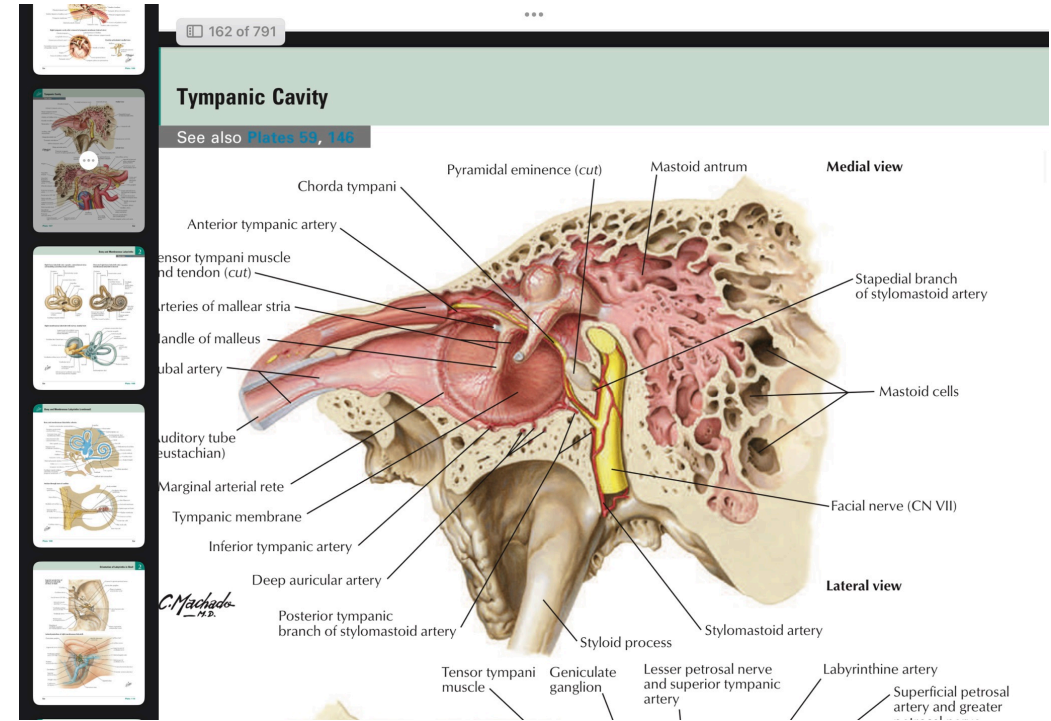
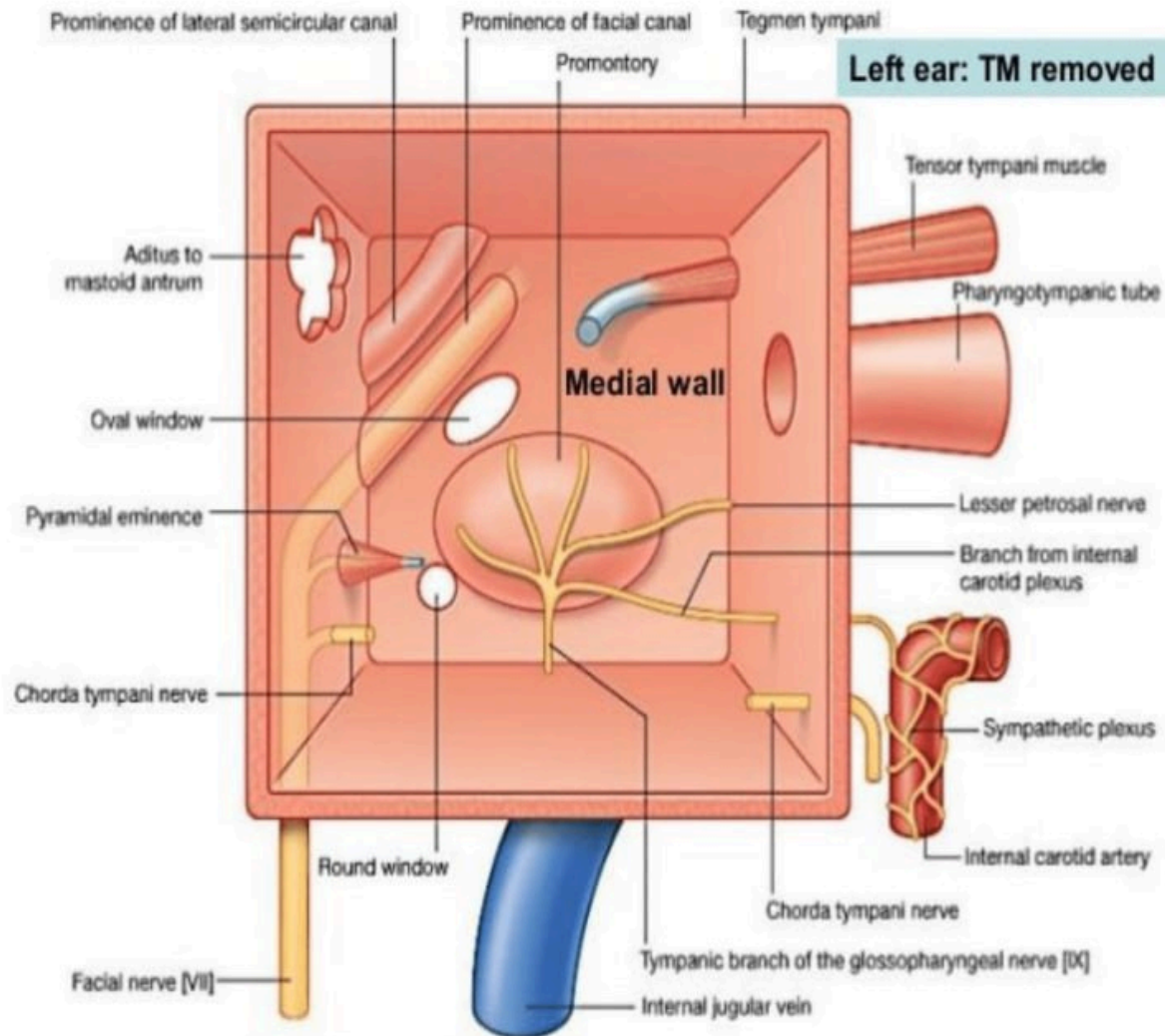
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Contents of Middle Ear

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Malleus
المطرقة

Incus
السندان

Tensor tympani M

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.

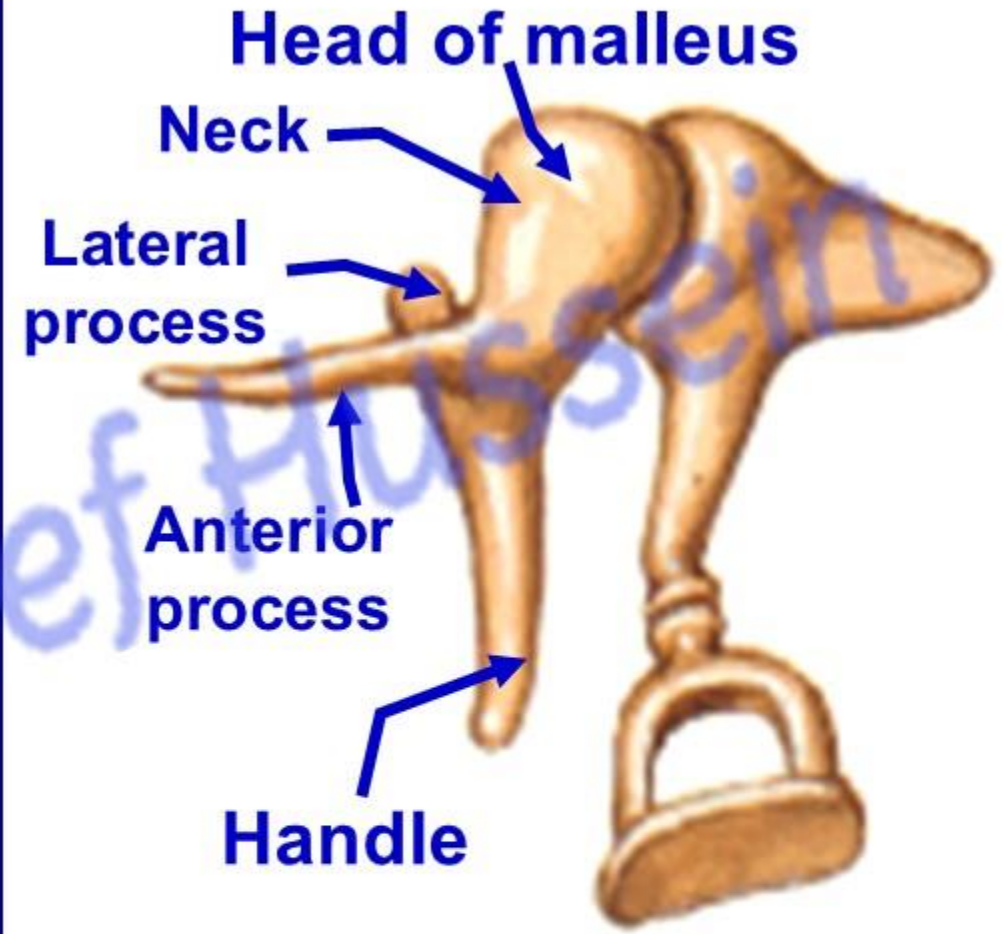
c- Handle is attached to inner surface of **tympanic membrane**.

* 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

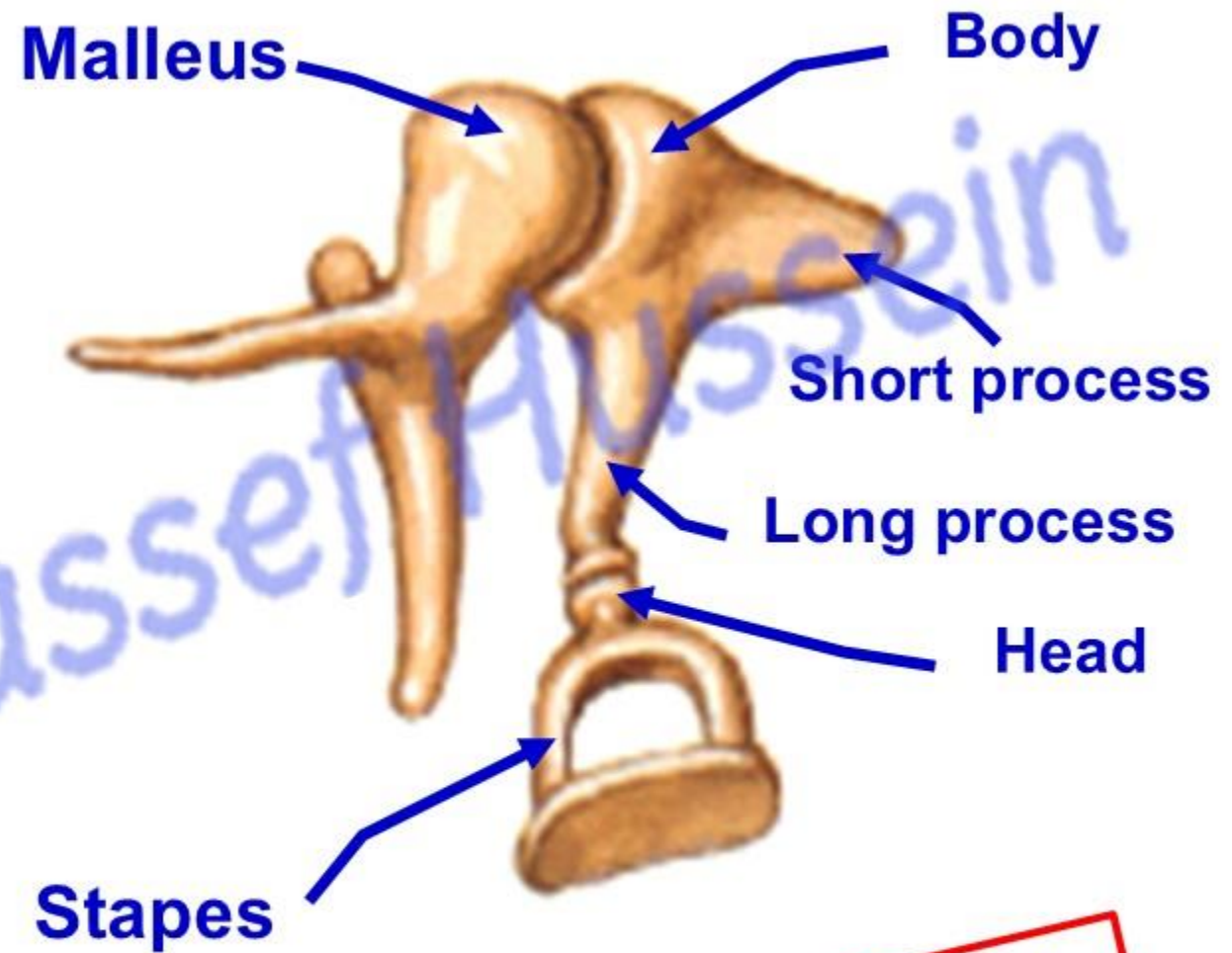
- It is anvil-like

* 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

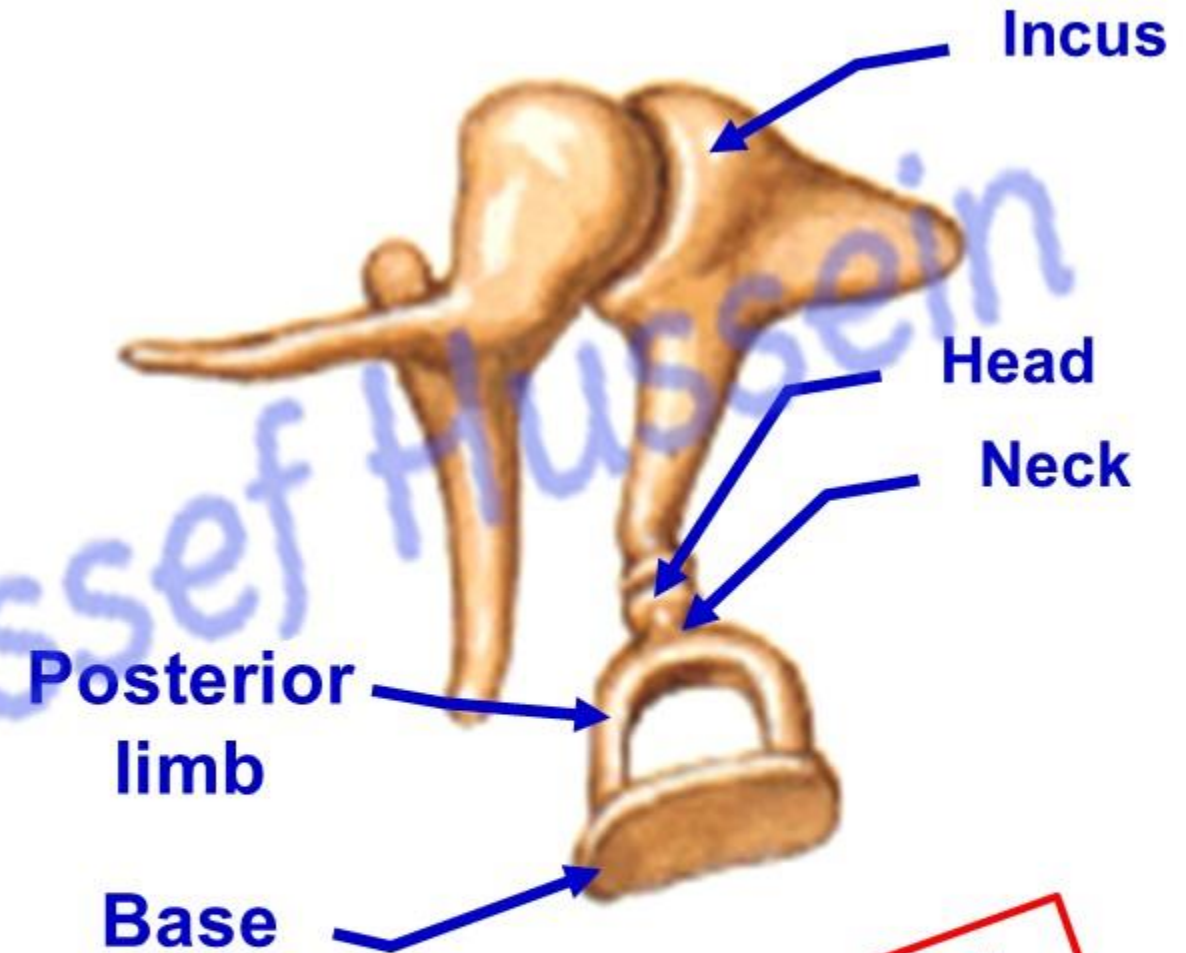
- It is stirrup- like.
- It is formed of.

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

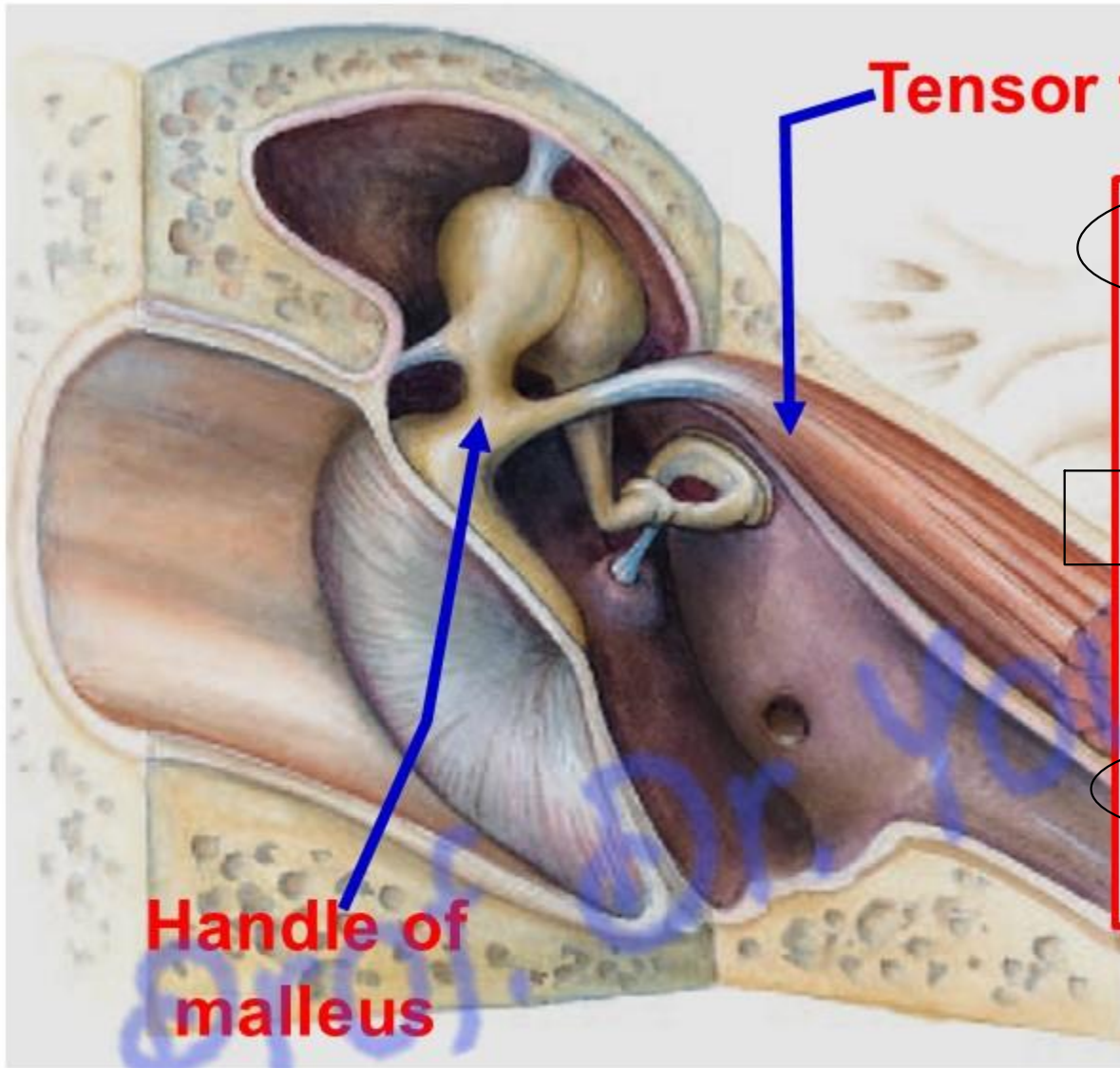
- * **Neck** is a narrow part below head, revived insertion of stapedius muscle.

- * **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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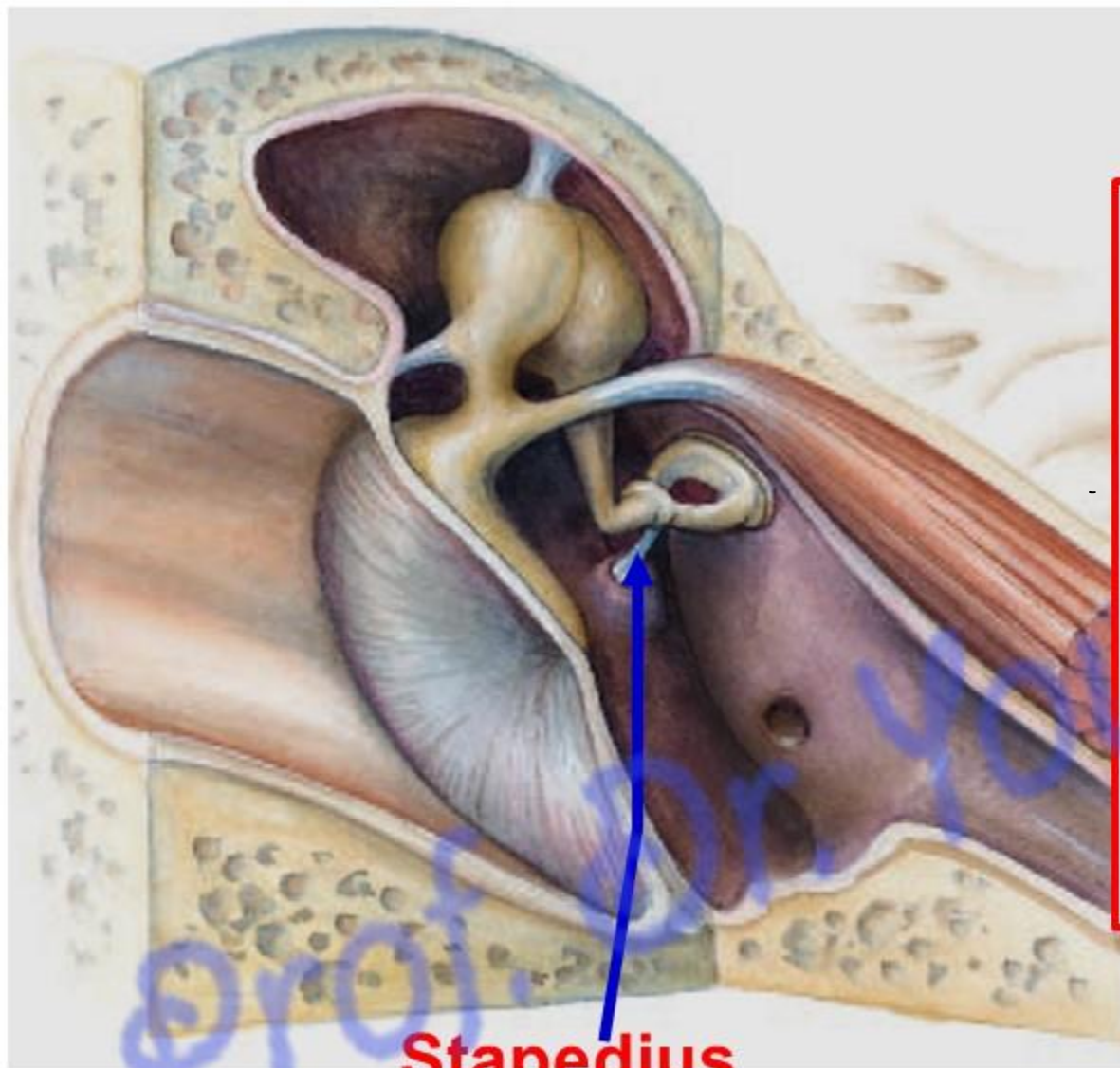


Tensor tympani M

- * **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).

- **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. *Tonsile , middle Ear.*

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- **Applied anatomy;**

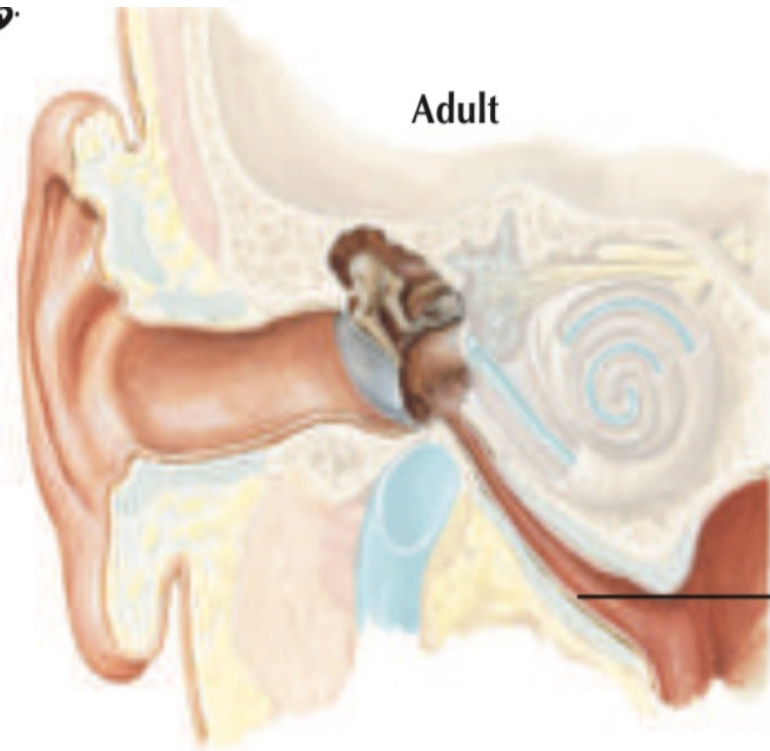
- **Hyperacusis**, In **facial paralysis**, Sound waves are transmitted without any protective control because of paralysis of the **stapedius**.
- **Otitis media** is a condition of **middle ear infection** that may be spread from the nasopharynx through the auditory tube, causing rupture of tympanic 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

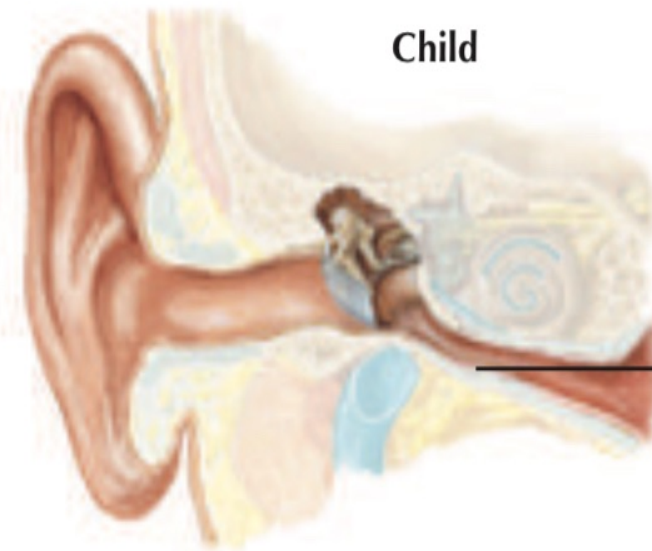
- It extends downward, forward and medially from the middle ear cavity to nasopharynx
- Its lateral 1/3 is bony part while the medial 2/3 is cartilaginous.
- It **equalizes pressure** of the air on both sides of the tympanic membrane.
- It forms angle 45° with the sagittal plane (Adult) while in infant,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

F. N. M. D.



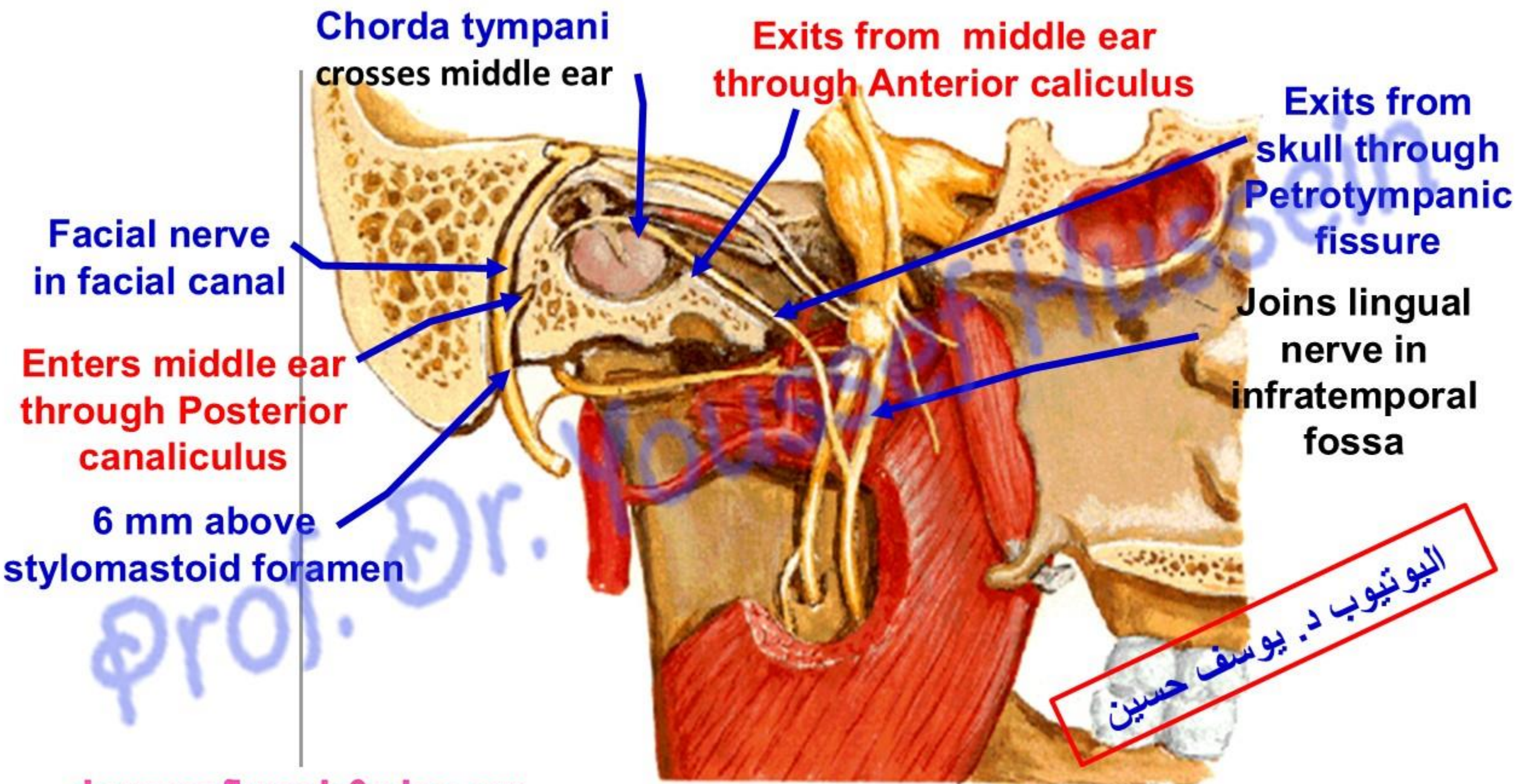
Adult

Auditory tube
(eustachian)



Child

Auditory tube
(eustachian) is shorter
and more horizontal



**Chorda tympani
crosses middle ear**

**Exits from middle ear
through Anterior caliculus**

**Exits from
skull through
Petrotympanic
fissure**

**Joins lingual
nerve in
infratemporal
fossa**

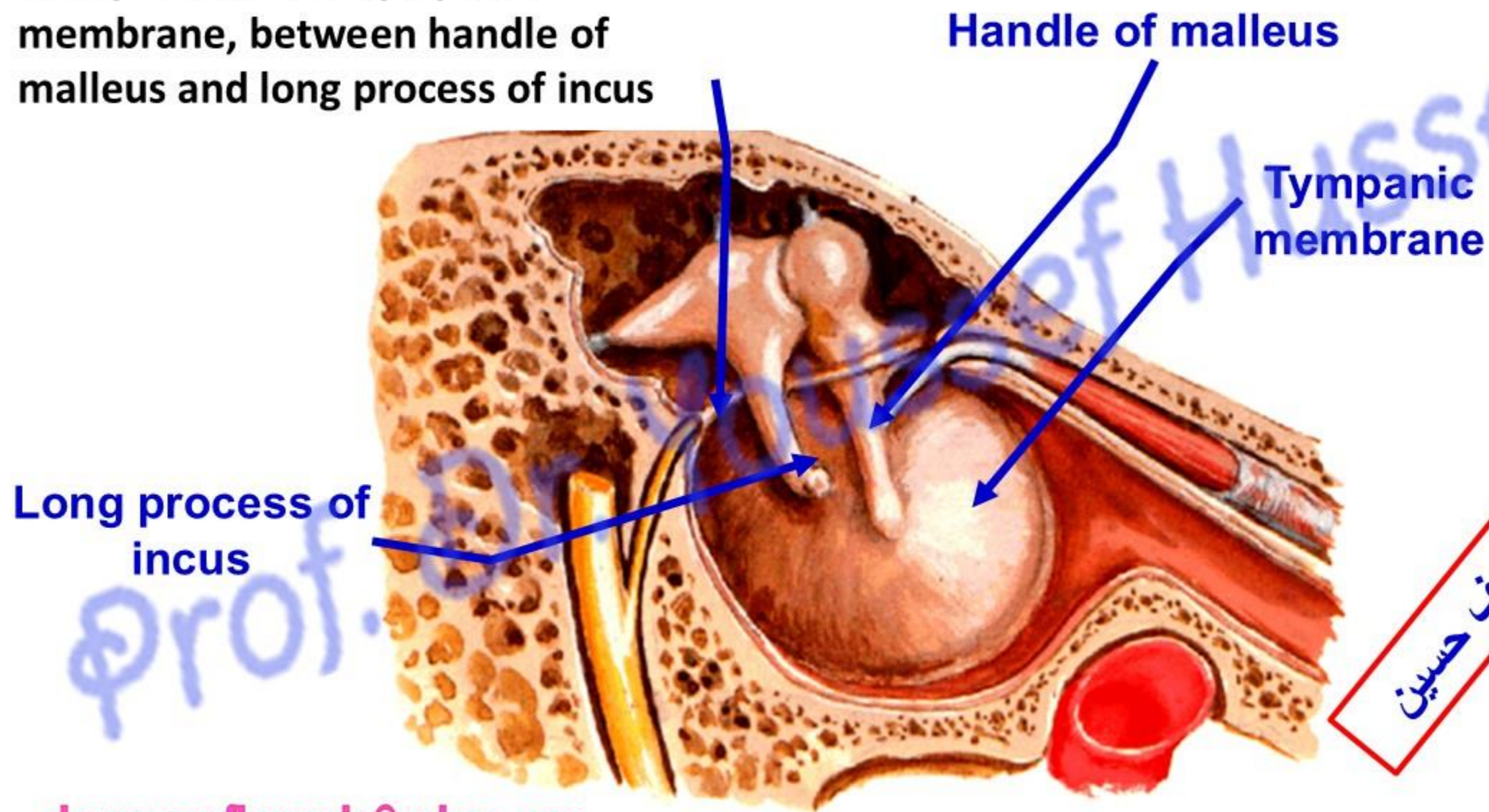
**Facial nerve
in facial canal**

**Enters middle ear
through Posterior
canaliculus**

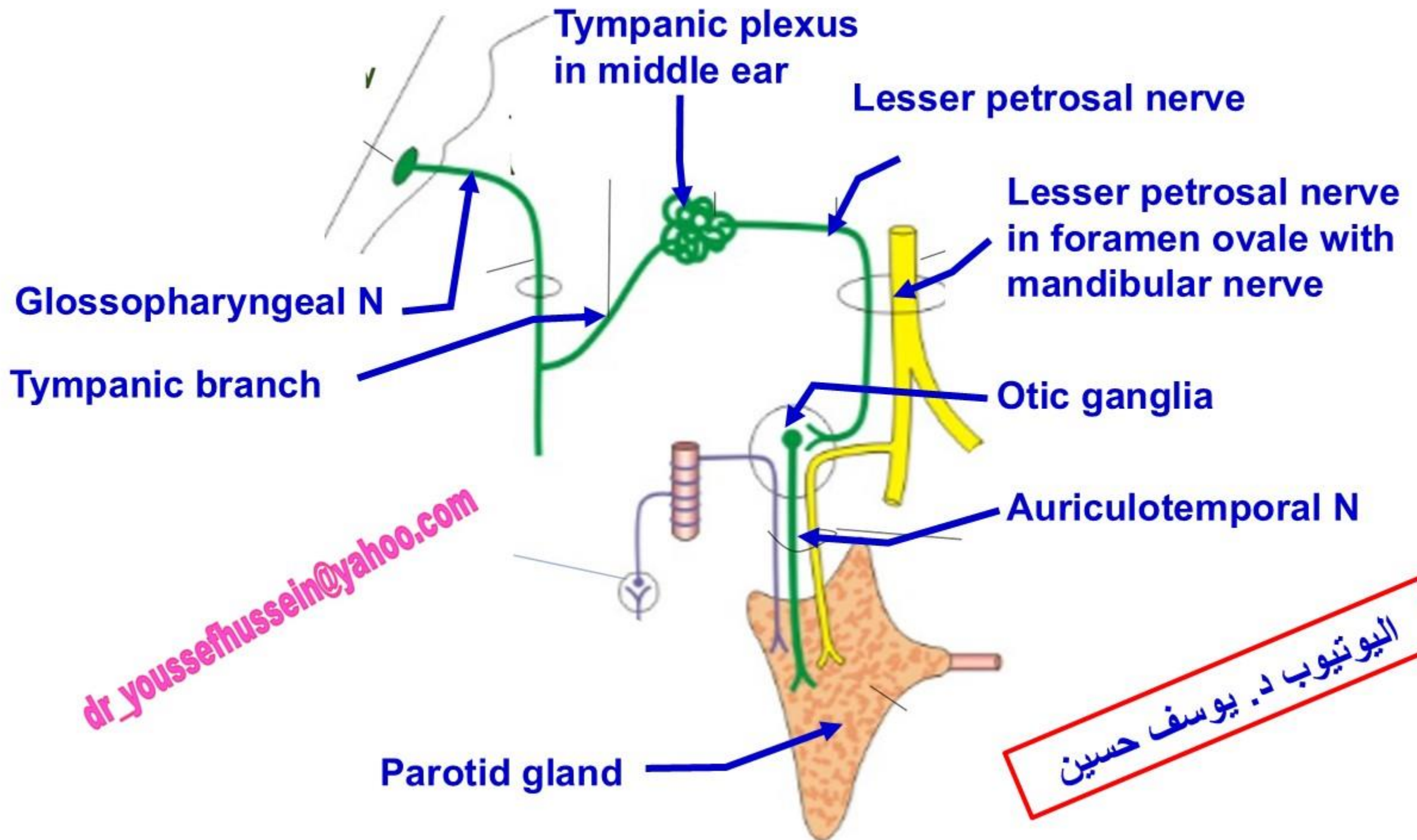
**6 mm above
stylomastoid foramen**

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



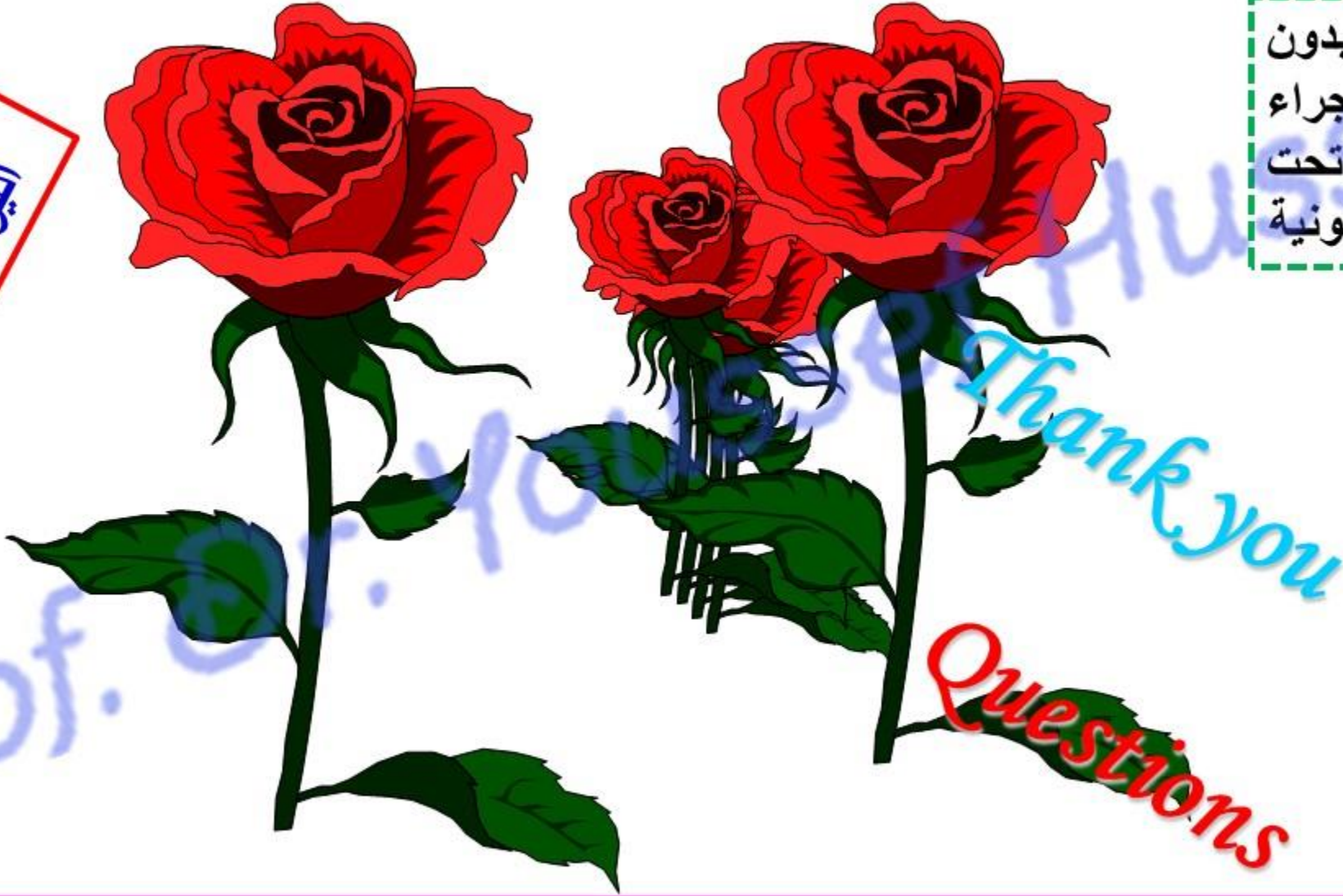
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