EAR - II

Presented by:
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COMPETENCIES

**AN40.2:** Describe & demonstrate the boundaries, contents, relations and functional anatomy of middle ear and auditory tube

**AN40.4:** Explain anatomical basis of otitis externa and otitis media
Lesson Plan

Middle Ear:
- Introduction
- Communications
- Contents
- Subdivisions
- Boundaries:
  - Roof
  - Floor
  - Anterior Wall
  - Posterior Wall
  - Medial Wall
  - Lateral Wall
Middle Ear

- malleus
- incus
- stapedius (muscle)
- stapes
- tensor tympani (muscle)
- eustachian tube
Introduction

• Middle ear is slit-like air filled cavity within the petrous part of temporal bone.

Shape-

• Cuboid which is compressed from side to side.
• In coronal section- biconcave disc like.
Communications

Anteriorly-
- With Nasopharynx through Pharyngotympanic tube.

Posteriorly-
- With Mastoid antrum through aditus to mastoid antrum.
Contents

Outside the mucosa:

- **Ear Ossicles-**
  - Malleus.
  - Incus.
  - Stapes.

- **Muscles-**
  - Tensor tympani &
  - Stapedius.

- **Nerves-**
  - Chorda tympani &
  - Tympanic branch of Glossopharyngeal.

- **Arteries & Veins**

- **Ligaments of ear ossicles.**
Subdivisions

- Epitympanum (Attic)
- Mesotympanum
- Hypotympanum

**Epitympanum**
- A part above the tympanic membrane.
- It contains:
  - Head of Malleus.
  - Body and short process of Incus.

**Mesotympanum**
- A part opposite to the tympanic membrane.
- It is the narrowest part of middle ear.
- It contains:
  - Handle of Malleus.
  - Long process of Incus.
  - Stapes.

**Hypotympanum**
- A part below the tympanic membrane.
Boundaries

- Roof
- Floor
- Anterior wall
- Posterior wall
- Medial wall
- Lateral wall
Boundaries of Middle Ear contd...

**Roof**
It is formed by tegmen tympani.
- It separates the tympanic cavity from middle cranial fossa.

**Floor**
- It is formed by a thin plate of bone.
- It separates the tympanic cavity from jugular bulb.
- Tympanic branch of Glossopharyngeal nerve (Jacobson’s Nerve) pierces the floor between the jugular fossa and lower opening of carotid canal.
Anterior Wall

- It is formed by a thin plate of bone.
- Its lower part separates the tympanic cavity from Internal Carotid Artery.
- Its upper part has **two canals:**
  - Upper one for the **Tensor tympani muscle.**
  - Lower one for the **Auditory tube.**
- Bony partition between the two canals extends backwards along the medial wall of tympanic cavity and called **Processus Cochleariformis.**
Posterior Wall

- This wall separates the tympanic cavity from mastoid antrum and mastoid air cells.

- It presents following features:
  - Aditus-ad-antrum
  - Fossa Incudis
  - Pyramid
  - Vertical part of facial canal
  - Posterior canaliculus for chorda tympani nerve.

**Aditus-ad-antrum**
- It is present in the upper part.
- Through this tympanic cavity communicates with the mastoid antrum.

**Fossa Incudis**
- It is a small depression close to the aditus-ad-antrum.
- It lodges the short process of Incus.
Posterior Wall contd...

**Pyramid**-
- It is a hollow, conical bony projection below the aditus-ad-antrum.
- It contains the Stapedius muscle.

**Vertical part of Facial canal**-
- It is present behind the pyramid.

**Posterior canaliculus for chorda tympani nerve**-
- It is a small aperture for emergence of chorda tympani nerve.
Medial Wall

- It separates the middle ear from internal ear.

- It presents the following features:
  - Promontory
  - Oval Window (Fenestra vestibuli)
  - Round Window (Fenestra cochleae)
  - Sinus Tympani.
  - Prominence of oblique part of Facial canal
  - Prominence of Lateral semicircular canal of internal ear
Promontory

- It is a rounded prominence in the centre of medial wall.
- It is produced by basal turn of cochlea.
- Tympanic branch of Glossopharyngeal nerve (Jacobson’s nerve) ramify on it to form tympanic plexus.
Medial Wall contd...

Oval Window (Fenestra Vestibuli)-

- It is an oval aperture located above and behind the promontory.
- It is closed by base (footplate) of stapes and annular ligament.

Round Window (Fenestra Cochleae)-

- It is a small, round opening below and behind the promontory.
- It is closed by secondary tympanic membrane.
- Secondary tympanic membrane separates the middle ear from scala tympani.
Medial Wall contd...

**Sinus Tympani**-
- It is a depression behind the promontory between oval and round window.
- It indicates the position of ampulla of posterior semicircular canal.

**Prominence of oblique part of Facial canal**-
- It is present above the oval window.

**Prominence of Lateral semicircular canal of internal ear**-
- It is a small ridge high up in the angle between medial and posterior walls.
Lateral Wall

- Most of the lateral wall is formed by **tympanic membrane**.
- Chorda tympani nerve passes across the tympanic membrane, lateral to the long process of Incus and medial to the handle of Malleus.
- Chorda tympani nerve enters the tympanic cavity through the posterior canaliculus.
- Chorda tympani nerve leaves the tympanic cavity through the anterior canaliculus.
Thank You