

Otitis externa

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Introduction

- Otitis externa (OE) represents a state of **infection** or **inflammation** of the external auditory canal (EAC).
- The severity can range from a **mild inflammation** to **osteomyelitis** of the skull base.
- this can represent an **acute episode** or a process **lasting years**.
- OE is responsible for **hundreds of millions** of dollars of health care expenditures yearly and has a significant impact on the **quality of life** of those affected.

pathophysiology

- The **preinflammatory** stage consists of **edema of the skin** of the EAC and subsequent **obstruction of the glands** induced by local trauma or moisture, predisposing to further trauma.
- The **acute inflammatory** stage can be classified as **mild, moderate, or severe**.



pathophysiology

- **Mild acute** inflammation is characterized by an **erythematous** and **edematous** EAC with **clear, odorless secretions**.
- The inflammation becomes **moderate** with **increasing edema** and **pain**, as well as **mucopurulent** secretions



pathophysiology

- In **severe inflammatory** OE, the EAC becomes **obstructed** with debris and secretions, is **intensely painful**, and is often associated with **periauricular edema** and **adenopathy**.



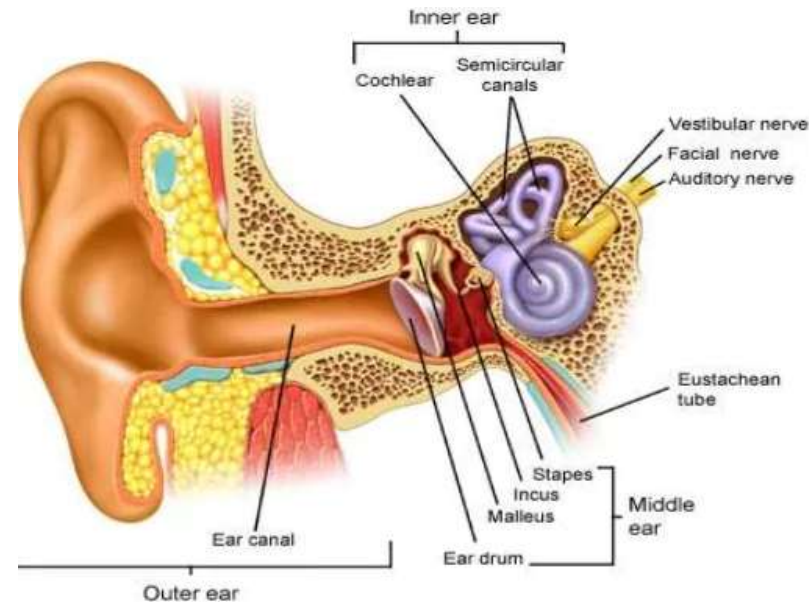
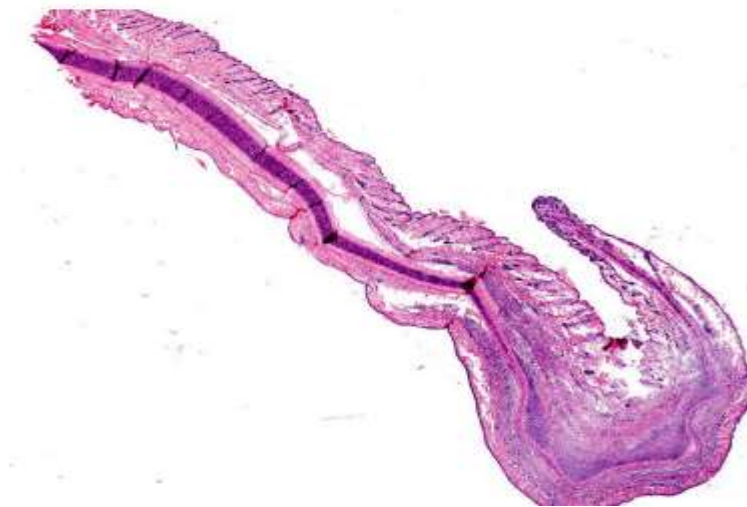
pathophysiology

- **Chronic inflammation** is defined as a single episode lasting greater than **4 weeks** or **four or more episodes** within one ear.



Anatomy of the External Ear

- The external ear includes the **auricle** and the **EAC**.
- The auricle consists of keratinizing squamous epithelium covering a framework of elastic cartilage with **perichondrium tightly bound to its lateral surface and more loosely bound to its medial surface**.



Anatomy of the External Ear

- The EAC extends from the lateral surface of the tympanic membrane (TM) to the external auditory meatus; it measures approximately **2.5 cm** in adults.
- A bony wall surrounds the **medial two-thirds** of the canal, with the **lateral one-third** possessing a cartilaginous skeleton.



Anatomy of the External Ear

- **The cartilaginous portion** contains **hair follicles** along with **sebaceous** and **apocrine glands** beneath a squamous epithelial surface layer.
- **Cerumen** is found in this portion of the canal; it is a **hydrophobic**, **slightly acidic** (pH 6.0 to 6.5) substance formed by glandular secretions and sloughed epithelium.
- Transverse slits in the cartilaginous canal (**the fissures of Santorini**) allow for the spread of infection or neoplasms from the external canal to the surrounding soft tissues.

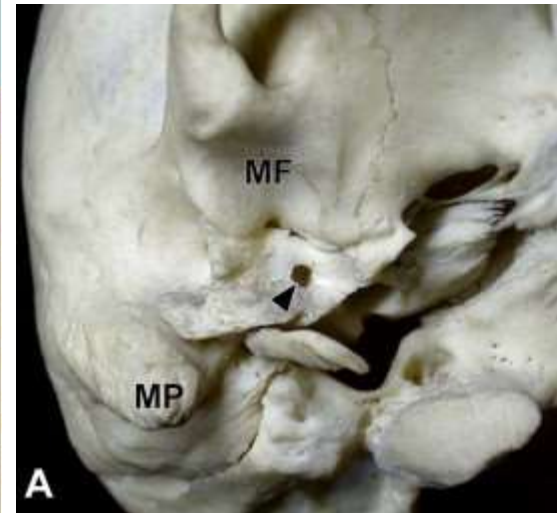


Anatomy of the External Ear

- The **tympanic portion** of the **temporal bone** forms the majority of the osseous EAC.
- The bone is covered by **a thin layer of squamous epithelium** that is tightly adherent to the bone and continuous with the lateral surface of the tympanic membrane.
- There is no subcutaneous layer and no glands or hair follicles.
- **The junction of the bony and cartilaginous canal** is known as the **isthmus** and represents the **narrowest** portion of the canal.

Anatomy of the External Ear

- The foramen of **Huschke** is a defect in the anterior bony canal from incomplete ossification that allows for the spread of disease to the deep lobe of the parotid gland.



Anatomy of the External Ear

- **Normal flora** isolated from the EAC and cerumen is overwhelmingly **gram positive**.
- ***Staphylococcus auricularis* and *Staphylococcus epidermidis***.
- Coryneform bacteria (diphtheroids), streptococci, and enterococci .
- ***Pseudomonas aeruginosa* and fungal species** are **rare** in the EAC of normal subjects.



Biochemical Test and Identification of *Staphylococcus epidermidis*



Acute Otitis Externa

- also known as “**swimmers' ear**” or “**tropical ear**”.
- involves the rapid onset (**<48 hours**) of signs and symptoms of ear canal inflammation.
- It is generally **unilateral** .
- associated with exposure of the ear canal to **water** or **local trauma**.
- is more common in the **summer** months.
- The age group with the highest incidence of AOE includes **5- to 10-year-olds**.

Predisposing factors

- congenitally narrow canal .
- a canal narrowed by exostoses.
- skin conditions including eczema
- Seborrhea
- Psoriasis
- trauma from ear plugs
- hearing aids
- diabetes and HIV



Signs and Symptoms



- **Acute Otitis Externa:**
- The presenting symptom for **bacterial** AOE is often **moderate to severe otalgia** worsened with manipulation of the pinna.
- Symptoms are often present from **several days to a week**.
- Early AOE may include **pruritus** and **erythema** with a **scant clear discharge**.
- As the infection progresses, the **pain** and **edema** become worse and the discharge becomes **seropurulent**.

Signs and Symptoms

- **Acute Otitis Externa:**
- The edema of the canal skin combined with otorrhea and debris in the canal may lead to a **feeling of fullness** and a **conductive hearing loss**.
- lymphadenopathy of the preauricular or cervical lymph nodes.
- There is **tenderness** with manipulation of the pinna in AOE.
- which must be differentiated from tenderness of the mastoid tip in **acute mastoiditis**.
- A complete **neurologic examination** should be conducted to ensure that there is no evidence of extension to the **facial nerve**, vestibular organs, or other cranial nerves.

Signs and Symptoms

- **Viral** acute OE is **rare**.
- Offending organisms include varicella, measles, and herpesvirus.
- **Herpes zoster** can affect the ear canal without (herpes zoster oticus [HZO]) or with *facial paralysis* (**Ramsay Hunt syndrome**) and may also be associated with *sensorineural hearing loss or vertigo*.



Signs and Symptoms

- In the case of **fungal OE**, **pruritus** is often **more severe** and there is **commonly clear drainage**.
- **Candidal infections**: cotton- like
- **Aspergillus infections** :wet newspaper



Investigations

- A thorough history should include the **timing, duration, and severity** of symptoms.
- Exposure to **swimming-pool water** and **aural toilet habits** are an essential part of the history.
- Periods of improvement or worsening of symptoms should be described, as well as previous treatments.
- Systemic diseases—such as allergies, **autoimmune disorders, immunosuppression, HIV, diabetes, or skin or hair conditions**—may elucidate an underlying cause.

Investigations

- Additionally, topical treatments used in and around the ears should be evaluated.
- **Physical examination** should include a complete examination of the **auricle** and of the **EAC** under **binocular microscopy** in addition to a complete physical examination to evaluate for signs of systemic diseases.
- **Culture** of the ear canal should be taken for bacteria and fungus, especially for **persistent infections**.
- In cases of presumed OE that are resistant to treatment, **biopsies** should be taken to **exclude malignancy**.
- Generally **radiologic examination** should be reserved for cases where spread beyond the EAC is suspected.

Microbiology



- **Bacterial infections** account for more than **90%** of cases of AOE, with **fungal infections** accounting for the rest.
- ***P. aeruginosa*, *S. epidermidis*, and *S. aureus*** .
- ***Aspergillus* and *Candida*** . (But represent less than 2% of cases of AOE).
- fungal OE more commonly follows antibiotic treatment for a bacterial AOE.
- *Pseudomonas* and *Staphylococcal* species are often identified in **COE**; however, gram-negative isolates such as ***Escherichia coli*** and ***Enterococcus*** can be present

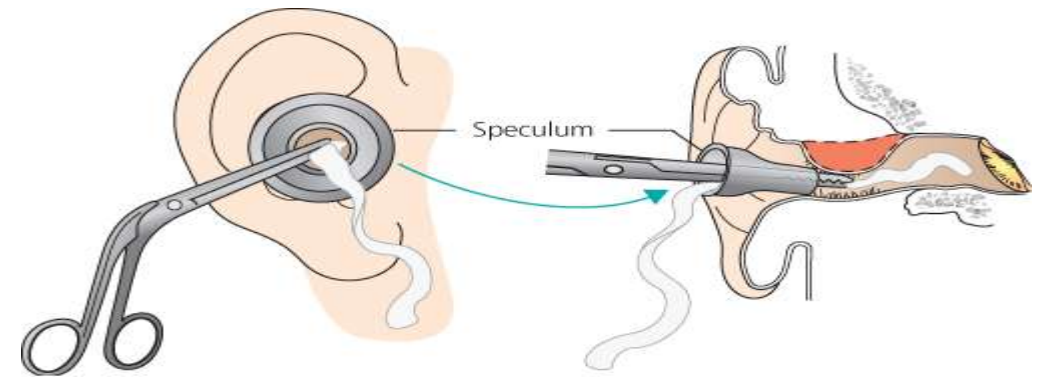
Treatment

- Acute Otitis Externa:
- The first line of treatment for AOE is largely preventive.
- Occlusive **earplugs** should be used for swimming.
- proper fitting of hearing aids.
- **Drying** of the EAC should be encouraged.
- **Topical therapy** is the **treatment of choice** for AOE, as oral antibiotics have been shown not to be effective.



Treatment

- Commonly used **topical antibiotics** include **fluoroquinolones** or an **aminoglycoside** combined with a second antibiotic for pseudomonal coverage and a **steroid** to reduce inflammation.
- **Acetic acid** irrigation in the absence of antibiotics maybe effective in early AOE.
- **Debridement of the EAC** is an important adjuvant to medical therapy.
- If the tympanic membrane cannot be visualized, a **wick** may have to be placed.



Treatment



Otomycosis -TREATMENT

- - Cleaning
- - Antimycotic (clotrimazole) ear drops
- - Drying agent
- Acidification of the ear canal
- Gentian violet
- Tolnaftate
- Itraconazole

