Disclaimer

This movie is an educational resource only and should not be used to manage your health. All decisions about the management of Earache must be made in conjunction with your Physician or a licensed healthcare provider.
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INTRODUCTION

_Earache_, also called Otalgia, is a condition causing pain in the ear. In order to understand about Otalgia, it is important to understand the normal anatomy of the Ear.
NORMAL EAR ANATOMY

The ear constitutes an important component of the sensory system. The main function of the ear is to maintain balance and convert sound into electrical impulses after amplifying them. These electrical impulses are than transmitted into the brain.

(Refer fig.1)

For descriptive purpose the ear is divided into

- The External Ear
- The Middle Ear
- The Inner Ear

(Refer fig. 2)

External Ear

The external ear consists of the Pinna or auricle and the external auditory canal.

Pinna

This is the part of the ear that projects from the side of the head. It helps in collecting sound and directing the traveling sound waves into the external auditory canal. It consists of elastic cartilage that is covered by skin.

(Refer fig. 3)
External Auditory Canal

The external auditory canal measures about 2.5 cms and extends from the Pinna to the Tympanic membrane. Its outer part is cartilaginous while the inner part is bony. At its medial end (inner) is the eardrum or Tympanic membrane. It is lined by skin. The skin is rich in sebaceous and ceruminous glands (sweat glands). The products of these glands mix to form wax.

(Refer fig.4)

Middle Ear

The middle ear resembles a matchbox with a vertical diameter of 15mm and transverse diameter of 4mm. It consists of the tympanic membrane and middle ear bones or ossicles. The middle ear communicates with the nasopharynx (area behind the nose) through the Eustachian tube.

(Refer fig.5)

Tympanic Membrane

It is a transparent disc situated between the external ear and the middle ear. The eardrum has a diameter of approximately 8 to 9mm. It has an outer skin layer and an inner mucous layer.

(Refer fig.6)

Middle Ear Ossicles (Bones)

These consist of a chain of three movable bones -- malleus, incus and stapes.

(Refer fig.7)
Malleus
The malleus is the largest of the three ossicles measuring about 8mm in length. The malleus resembles a hammer and is the outer most (lateral) ossicle. It is firmly fixed to the eardrum at one end while the other end articulates with the incus.

(Refer fig.8)

Incus
The incus is present between the malleus and stapes. It is shaped like an anvil.

(Refer fig. 9)

Stapes
The stapes is the smallest of the three ossicles resembling a stirrup. It is attached to the incus at one end and its other end, the footplate, articulates with the inner ear via the oval window.

(Refer fig. 10)

Inner Ear
The inner ear lies in the temporal bone. It consists of three Semicircular canals (anteriorly), Cochlea (posteriorly) and the Vestibule (middle).

(Refer fig. 11)
All the inner ear structures have an outer bony shell inside which the membranous end organs (receptors & nerve endings) of hearing and balance are suspended. Two fluids surround this membranous end organ. The fluid inside the membranous end organ is called Endolymph and the fluid outside the end organ, between the bony shell and the end organ, is called Perilymph. These fluids protect the membranous end organ and help in normal functioning of the membranous end organ.

Semicircular Canals

These are three semi-circled tubes set at right angles to each other. The canals are named horizontal, anterior vertical & posterior vertical. The membranous end organ here contains the organ of balance or equilibrium.

(Refer fig. 12)

Cochlea

This is a snail like structure inside the ear from which the organ of hearing is suspended. It is coiled for two and half turns.

From these membranous end organs the Auditory nerve arises which carries impulses into the brain.

(Refer fig. 13)
Earache Causes: External Ear

The external ear is formed by the Pinna, the outer visible part of the ear, and the external auditory canal, a tube-like structure joining the Pinna and the middle ear.

The inflammation of the external ear is called Otitis Externa. Otitis Externa is one of the most painful conditions known. The inflammation of the external ear causes more pain compared to the clinical signs as the skin is very tightly adhered to the underlying cartilage.

Causes include:

- Infective: Bacterial, fungal and viral causes
- Trauma
- Malignant Otitis Externa

Infective

Bacterial Causes of Otitis Externa:

- A furuncle or boil is a localized Otitis Externa.
- Diffuse Otitis Externa involves the skin of the external auditory canal including the eardrum. Predisposing factors are

  - Hot & humid climate
  - Scratching with dirty nails
  - Swimming
  - Allergic conditions

(Fig. 14)

Fungal Causes of Otitis Externa:

A fungal infection of the ear is also called Otomycosis. It is common in tropical regions during the hot and humid months. Pain is dull ache in type. Main symptoms are irritation and itching. On examination, white, grey or black flakes of fungal elements are seen.

Viral Causes of Otitis Externa:

Herpes Zoster is a viral infection involving the cranial nerves caused by the virus Varicella Zoster. It frequently begins with pain. Vesicular eruptions develop on the Pinna and the external auditory canal.

Myringitis bullosa is a painful condition where vesicular eruptions are seen on the tympanic membrane (ear drum).
Trauma

Blunt trauma to the external ear can cause hematoma (collection of blood) between the cartilage of the ear and its covering, called perichondrium, due to the shearing effect.

Malignant Otitis Externa

This is usually seen in elderly diabetics and other immunocompromised patients. The infection spreads from skin and cartilage to involve the bone underneath in the external auditory canal. Intense pain and ear discharge are common. As the disease progresses, facial paralysis and lower cranial nerve paralysis can occur. Granulation tissue at the junction of bone and cartilage of the external auditory canal is an important feature. MRI, Technetium 99m and gallium 67 bone scans confirm the diagnosis.

Earache Causes: Middle Ear

The inflammation of the middle ear is called Otitis Media. Causes include:

- Eustachian tube dysfunction
- Otitis media
- Tumor formation

Eustachian tube dysfunction

The Eustachian tube connects the middle ear with the nasopharynx (a region behind the nose). This tube maintains ventilation of the middle ear. Pain in Eustachian tube dysfunction or blockage results in reduced middle ear pressure and retraction of the tympanic membrane. Pain occurs usually in the night when the child is sleeping due to congestion of blood vessels in the tube area and reduced frequency of swallowing and consequently failure of the middle ear ventilation.

Otitis media

Otitis media is the inflammation of the middle ear. Otitis media is a frequent cause of Otalgia. 70% of all children have at least one episode of Otitis media. Peak age specific incidence of acute suppurative Otitis media is in the first 2 yrs of life, perhaps linked to day care entry. Causes include the presence of a short and horizontal Eustachian tube in small children allowing easy entry of organisms into the middle ear. School entry, parental smoking and respiratory virus exposure (eg. from siblings) are additional factors responsible for middle ear infection in children.

Tumor formation:

Severe pain in a chronically discharging ear may indicate tumor formation.
Earache Causes : Referred Pain

Pain may be referred to the ear from other areas supplied by the 5th, 9th and 10th cranial nerves. When earache is the presenting symptom and no local disease is found in the ear, a distant cause must be considered. Conditions that contribute to referred ear pain include:

(Refer fig. 15)

Earache Causes : Referred Pain

Ill fitting dentures
TMJ or Temporomandibular Joint Pain
Impacted teeth
Tonsillitis
Sinusitis
Cancer of the pyriform sinus (a part of the upper aerodigestive tract)
Recurrent headaches
Migraines

(Fig. 15)
Diagnoses

Your doctor will perform the following:

Medical History

- Physical Examination with focus on head and neck assessment
- Otoscopic examination of the ear
- Rhinoscopic assessment of the nose
- Nasopharyngoscopic examination of nasopharynx

Management: Treatment of Otitis Externa

Treatment for bacterial causes of Otitis Externa include the following:

- Localized Otitis Externa
- Diffuse Otitis Externa
- Treatment for fungal causes of Otitis Externa
- Viral causes of Otitis Externa
- Treatment for trauma to the external ear
- Treatment of malignant Otitis Externa
- Diffuse Otitis Externa

Localized Otitis Externa

Localized Otitis Externa is treated with the Icthammol and glycerine pack to the external auditory canal, antibiotics and pain relieving medication. If pus pointing is present, the pus is cleared by incision and drainage.

Diffuse Otitis Externa

Diffuse Otitis Externa is treated with antibiotic and pain relieving medication, cleaning the ear canal of the debris and canal packing with antibiotic ointment soaked gauze.

Treatment for fungal causes of Otitis Externa

Treatment for fungal causes of Otitis Externa involves removal of the fungal mass, administration of antifungal eardrops, and symptomatic treatment of pain and itching.

Viral causes of Otitis Externa

Viral causes of Otitis Externa are commonly treated with an antiviral medication. Your doctor will decide which medication is appropriate for your condition.
Treatment for trauma to the external ear

Treatment for trauma to the external ear includes evacuation of the hematoma. This may be performed via aspiration with a needle or incision and drainage. Infection of the perichondrium and the underlying cartilage is a possible complication of surgery, trauma or Otitis Externa. Progression causes severe pain, pus formation and loss of cartilage. Treatment is by antibiotics, debridement and close observation.

Treatment of malignant Otitis Externa

Management includes several days of intravenous antibiotics followed by several weeks of oral antibiotics and regular debridement.

Treatment of Otitis Media

Treatment for Otitis Media is with antibiotics and pain relievers. Sudden spontaneous resolution of pain in cases of true Otitis Media indicates perforation of the eardrum. Most eardrum perforations will heal on their own within weeks, sometimes months. Rarely, surgery may be needed to repair the eardrum. This procedure is called Tympanoplasty.

Treatment of Referred Pain

If the cause of Otalgia is due to referred pain, treatment will be focused on the cause of the referred pain. As an example, if ill-fitting dentures are causing the pain, properly fitted dentures can resolve the Otalgia.
Although every effort is made to educate you on Earache and take control, there will be specific information that will not be discussed. Talk to your doctor or health care provider about any concerns you have about Earache.
YOUR SURGERY DATE

READ YOUR BOOK AND MATERIAL

VIEW YOUR VIDEO /CD / DVD / WEBSITE

PRE - HABILITATION

ARRANGE FOR BLOOD

MEDICAL CHECK UP

ADVANCE MEDICAL DIRECTIVE

PRE - ADMISSION TESTING

FAMILY SUPPORT REVIEW

Physician's Name :  
Physician's Signature:  
Date :  

Patient’s Name :  
Patient’s Signature:  
Date :  