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OTALGIA

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Background

Definitions

Otalgia: earache or ear pain
Primary Otalgia: ear pain coming from the external, middle or inner ear
Secondary Otalgia: referred pain to the ear

Anatomy and Physiology

The most common presentation of otalgia is localized to pathology within or around the auricle and a physical examination will uncover the source. Appreciation of the anatomy of the ear will help in the examination but more importantly, it will help in diagnosing when no identifiable pathology is found on examination. The trigeminal, facial, glossopharyngeal, vagal and C2/C3 send sensory afferents to the middle ear, external ear, auricle and periauricluar area; consequently, pain referred via these nerves can cause otalgia.

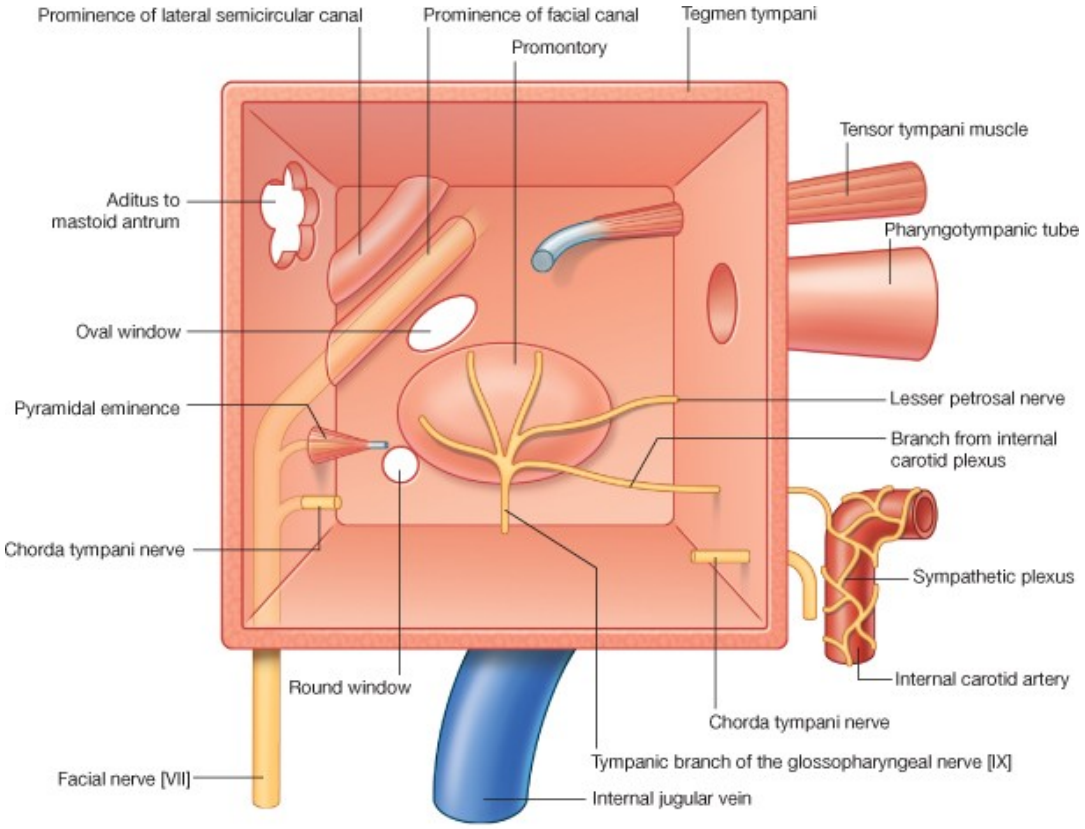

Figure 1: Journey of the facial nerve and branches of the facial and glossopharyngeal nerve through the middle ear. (Adapted from (1))

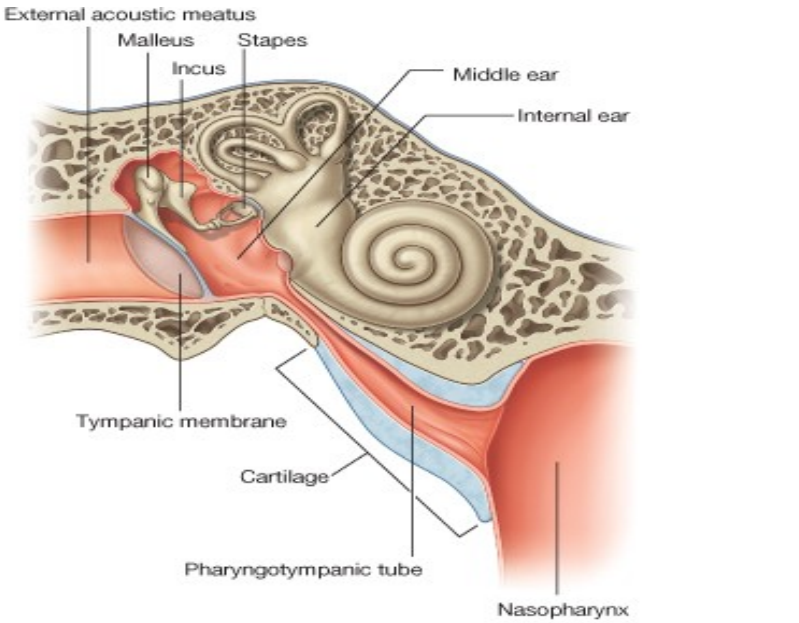

Figure 2: Internal structure of the ear. (Adapted from (1))

Historical Investigation

A careful history can help distinguish various conditions and in combination with a careful physical exam should provide enough information to make a diagnosis. In infants, the only possible clue of ear pain maybe ear pulling or rubbing in conjunction with irritability, poor sleep or fever.

If the child is able to answer questions, the timing and severity of the pain can help in the differential.

Severe pain: acute otitis media, otitis externa, TMJ dysfunction (worse with eating)

Intermittent severe pain: Chronic otitis media with effusion (glue ear)

Moderate pain: referred pain

Furthermore, it's important to enquire the patient or parent about purulent otorrhea, hearing loss, swelling, nystagmus, tinnitus or facial paralysis

Table 1: History and possible corresponding diagnosis

History	Possible Diagnosis
Purulent Otorrhea	Otitis externa, otitis media with perforation of tympanic membrane, trauma, neoplasm
Hearing Loss	Otitis media (most common), Otitis externa
Swelling	Otitis externa, perichondritis, mastoiditis, trauma, benign cystic masses, neoplasms
Nystagmus	Vestibular in origin
Tinnitus	Eustachian tube – middle ear disease
Facial Paralysis	Acute otitis media (most common)

Physical Examination

A complete examination of the head and neck is warranted when a child presents with otalgia. Many underlying congenital abnormalities can contribute to ear problems like cleft palate and nasopharyngeal tumours which are associated with otitis media.

The ease at which a physical is performed depends on the age and their ability to cooperate.

Position:
Child should examined on an examination table or parent's lap
An assistant or restraint may be necessary to help examine

Examination of the Ear:

- Inspect auricle and external auditory meatus:
    - Inflammation of posterior auricular area may indicate periosteitis or subperiosteal abscess from mastoid cells
    - Presence of preauricular pits or skin tags have higher incidence of sensory neural hearing loss (SNHL)
- Inspect the ear canal with otoscope:
    - Inflammation of ear canal associated with otitis externa
    - Abnormalities of canal like stenosis, bony exostoses, otorrhea can predispose one to otitis externa
    - Cholesteatoma of middle ear can display in canal as foul-smelling exudate
- Tympanic membrane (TM) mobility:
    - Using pneumatic otoscope, bulging TM caused by increased middle ear air pressure
    - Retracted eardrum indicates negative middle ear pressure
- Tympanic membrane appearance:
    - Normal appearance is silvery-gray, visualize malleus, incus
    - Middle ear effusion – white or yellow

Differential Diagnosis (selected)

Table 2: Common pediatric otalgia differentials (Adapted from (4))

Cause	Onset	Character	Location	Pattern	Precipitating factors
Acute Otitis Media	Acute	otalgia, decreased hearing, fever	affected ear	persistent otalgia	URTI
Chronic Otitis Media	Chronic	recurrent or persistent otorrhea	affected ear	mucopurulent discharge	none relevant
Otitis Externa	acute	moderate to severe ear pain and otorrhea	affected ear	persistent otalgia	swimming exposure
Eustachian Tube Dysfuncation	chronic	intermittent ear blockage	affected ear. May be bilateral	worse with supine position, increased pressure	none relevant
Dental Infection	subacute	dull aching pain in tooth socket	radiates to ear	persistent, worse with eating	poor dental hygiene
Mastoiditis	acute	otalgia, decreased hearing, fever	affected ear	persistent or worsening otalgia	antecedent URTI
Temporomandibular Joint Syndrome	acute, chronic	mild/severe pain over TMJ	radiates to ear	worse with jaw motion	night time bruxism
Chickenpox	acute	otalgia, fever, vesicular skin rash	nonspecific	varying	cluster of infections

Summary

Most common causes of otalgia will be a local cause, otitis media or externa, but it is important to be suspicious of referred pain to the ear which may indicate a more serious pathology. Treatment varies for the different etiologies of otalgia. For common local infections causing otalgia, it is not uncommon for physicians to restrain from antibiotic use for 3-5 days and observe whether the infection is resolving. A referral to a pediatric otolaryngologist is warranted for any of the

causes of otalgia that has not resolved with treatment, especially otalgia resulting in hearing loss.

References

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