Ear Infections in Children

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Personal Interest
Ear Anatomy

- External Ear
  - Auricle
  - Canal
- Middle Ear
  - Ear Drum
  - Ossicles
- Inner Ear
Infections

- Can involve any of the 3
  - External ear
    - Swimmers Ear or Otitis externa
  - Middle ear
    - Otitis media (most common child infection)
  - Inner Ear
    - Labyrinthitis
Normal Ear Exam
Middle ear Infections

- Otitis media
  - Most common ear infection in young children
  - Likelihood much higher in first 3 years of life
Childhood differences

- **Eustachian Tube**
  - **Childhood**
    - 17-18mm in length
    - Horizontal
  - **Adult**
    - 31-38mm in length
    - 45 degree angle
Childhood Differences

- Immune Naïve
- Environmental exposure
  - Exploration through touch and taste
Shared Germs
Confounding Factors

- Factors associated with increase
  - Pacifier use
  - Daycare attendance
  - Environmental tobacco smoke
- Factors associated with decrease
  - Breast Feeding
Eustachian Tube Inflammation

- Anatomy
- Viral infection
- Allergy
Ear Drum

- Air is needed behind ear drum
- Negative pressure, fluid can build up in ear
- Hearing can be effected
Ear Fluid
Ear effects

Ear Infection

A normal (left) ear drum and an ear with acute otitis media (right). Note the thin clear tympanic membrane (ear drum) on the left. The ear with acute otitis media has a bulging tympanic membrane (due to pus in the middle ear) and increased redness over portions of the drum.
“Scarred Ear Drum”: Tympanosclerosis

Tympanosclerosis

Normal

Tympanosclerosis
Middle Ear Infection

Symptoms

- Pain
- Fever
- Decreased hearing
Medical treatment

- Antibiotics
- Decongestants
- Nasal irrigation
- Nasal Steroid
Surgical Management: Ear Tubes

- One of the most common surgeries for Children
- Provide alternative route for pressure changes and fluid
- Allow Child to outgrow anatomic issues
Ear Tube limitations

- Average tube stays 9-12 months
  - Can extrude early
  - Can retain tube
    - Usually tubes come out on own
- Ear drum perforation
Ear Tubes
Ear Tube
Ear Drum Perforation

- Most heal spontaneously
- Location and size dictate effect on hearing
Ear Drum Perforations

20% CENTRAL

90% CENTRAL

10% MARGINAL

90% MARGINAL
Surgery for Ear Drum Perforation

4 month Post OP picture
Adenoids

- Enlarged Adenoids
  - Impair Eustachian tube function
  - Harbor infective agents
Adenoidectomy

Before

After
Adenoidectomy

- Proven to decrease incidence of Otitis Media
- Theorized to improve eustachian tube function
- Theorized to decrease pathogens near middle ear
Middle Ear Infection

Complications

- Mastoiditis
- Facial Paralysis
- Meningitis
- Brain Abscess
Swimmers Ear
Otitis Externa

- Swimmers ear
- Ear Canal slightly acidic
  - Moisture leads to change in pH
- Symptoms
  - Itching, Pain, Drainage, Decreased hearing
Outer Ear Infection

Causes

- Water Trapped in Ear
- Q-Tip trauma
- Wax Impaction
Swelling of Canal

- Trapping of
  - Moisture
  - Infection
- Inability to deliver drops
Outer ear Infection

swimmers ear
Severity
Treatment

- Antibiotics
- Debridement
- Ear Drops
- Ear Wick
Almost There
Inner Ear Infections

- Labyrinthitis
- Sterile Environment
  - No connection to outside world
- Inflammatory mediated
- Symptoms
  - Hearing loss, Ringing, Vertigo
Labyrinthitis Causes

- Auto-Immune
- Viral
- Bacterial
- Tumor
Treatment

- Steroids
  - Systemic
  - Transtympanic
- Antibiotics
- Antivirals
- Imaging
Conclusion

- Children many factors increase incidence of ear infection
- Multiple modalities of treatment dependent on correct diagnosis
- Questions?
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