

# Otitis and Sinusitis

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## Disclosures of Financial Relationships with Relevant Commercial Interests

- List of disclosures or “None”

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### WHATS WRONG WITH THE THREE MONKEYS!



EAR PAIN

SINUS PAIN

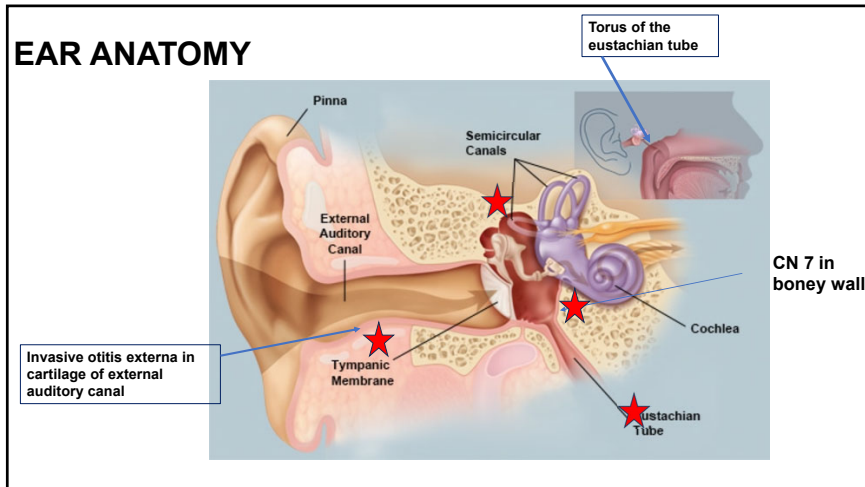
THROAT PAIN :  
PHARYNGITIS TALK

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## OTITIS



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- **Acute otitis externa “swimmer’s ear”**
- Cerumen, moisture. Maceration canal lining
- Cellulitis of external auditory canal.
- Canal red, edematous, full of debris and cerumen
- Tugging ear painful
- Staph aureus, epidermidis, C. acnes
- Rx. Gentle irrigation, cleansing. Wick if canal clogged.
- Burrow’s ear drops. Cipro-hydrocortisone drops

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- CASE: OTOMYCOSIS**
- You are called to the ER because to see a 35 yr old man, otherwise healthy, who presented with “dull” hearing in his ear. On looking into the external auditory canal, the resident saw “black fuzz” blocking the canal, which he recognized was a fungus ball.
  - Patient has no pain on pulling on his ear and no drainage but you see the black fuzz on the ear canal.
  - What is the fungus and management of this condition?

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- MANAGEMENT OF OTOMYCOSIS**
- Remove cerumen, debris and fungus by irrigation, cerumen spoon
  - Otic drops (Burrow’s) if canal lining inflamed. Antifungal not indicated.

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## ACUTE OTITIS MEDIA

- Eustachian tube blockage (<4 yrs, adenoids, viral URI'S)
- Nasopharyngeal flora infects middle ear: pain, hearing loss
- Infection: TM red, bulging, immobile
- Pneumococcus, nontypable H. influenzae, Moraxella
- Rx 1<sup>st</sup> gen cephalosporin, etc

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## CHRONIC SEROUS OTITIS



- Recurrent eustachian tube obstruction
- Painless hearing loss
- Middle ear becomes filled with fibrous tissue (“glue ear”), can lead to permanent hearing loss
- Tympanometry, pneumatic otoscope
- “Pneumatic equalization” tube inserted into TM
- Adenoidectomy (rare)

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## CASE

- 72yr old male, retired naval officer, presents in E.R. with increasing pain left ear of two day's duration. Given Augmentin + acetic acid/aluminum acetate ear drops in E.R. yesterday but pain worse. Laying head on pillow hurts, preventing sleep. Hearing “stopped up” on left. No chills, fever, cough or pain on chewing.
- PH DM 2. metformin
- PE T 38, P 92, BP 140/90. External auditory canal blocked by edema, cerumen. TM not visible. Tugging on left ear very painful. Mastoid not tender. No preauricular node.
- WBC 11.5 chems normal but glucose 180 mg/d.
- Differential diagnosis? Pathogen?

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## 77 yr old. severe ear pain, inflamed canal

### The most likely pathogen is?

- A. Staphylococcus aureus
- B. Aspergillus fumigatus
- C. Streptococcus pyogenes
- D. Pseudomonas aeruginosa
- E. Rhizopus arrhizus

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## ANSWER D. PSEUDOMONAS AERUGINOSA

### DIAGNOSIS: MALIGNANT (NECROTIZING) OTITIS EXTERNA

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## “INVASIVE” OTITIS EXTERNA AKA “MALIGNANT” OTITIS EXTERNA

- Diabetics and elderly
- Rapidly increasing pain in ear canal. Fever low grade or absent.
- Canal boggy, red. Pus. If TM visible, looks normal. Pinna painful if tugged.
- Hearing normal unless canal blocked by edema and debris
- Progression may extend anteriorly to temporomandibular joint or medially to 7<sup>th</sup> nerve
- Temporal bone osteo, sigmoid sinus thrombosis, brain abscess
- **Pseudomonas aeruginosa most common pathogen**
- Rx. Piperacillin-tazobactam or Ceftazidime or Cefepime 4-6 weeks

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## CASE

A 70-year-old female in excellent health had 3-day history of stabbing pain and itching in her left ear.

On the second day of the pain, she developed pain in her left jaw, spreading to her left cheek. Chewing caused some pain in the left cheek, and she had some difficulty swallowing. Hearing was poor in her left ear.

On exam, she was afebrile, alert and oriented and had erythematous vesicles and moistness in the left external auditory canal plus some flattening of the nasolabial fold and lesser smile on the left. Sensoneural hearing loss in the left ear was present. The tympanic membrane could not be visualized because of pain on otoscopy.

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## Healthy woman with ear pain, vesicles, Bell's palsy

### What diagnostic test on the ear exudate is most likely to yield the correct diagnosis?

- A. Routine bacterial culture
- B. Fungal smear and culture
- C. PCR for HSV
- D. PCR for VZV
- E. AFB smear and culture

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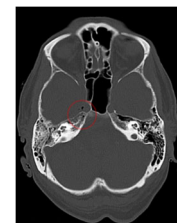
**ANSWER: D. PCR FOR VZV**  
**DIAGNOSIS: Ramsay Hunt syndrome**

- Herpes zoster of the geniculate ganglion of the 7<sup>th</sup> cranial nerve
- Pain in ear, vesicles in external auditory canal, Bell's palsy
- Can extend to 8<sup>th</sup> cranial nerve in internal auditory canal and cause deafness, vertigo or tinnitus (bad prognostic sign)
- Chorda tympani branch: taste distortion, numb or burning
- Early IV acyclovir to decrease permanent nerve damage

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**CASE**

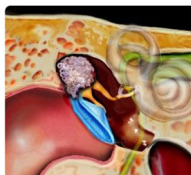
- ENT consults ID for treatment of chronic otitis media
- 56 yr female, otherwise healthy, treated with multiple courses of antibiotics for chronically draining ear. tm has marginal perforation. CT shows fluid in mastoids. swab from external canal has MRSA and mixed gram negative flora.
- No drug allergies. Prior regimens:
  - Amoxicillin, cipro, augmentin, moxifloxacin
- Drainage less then relapses
- Management?



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**CHRONIC OTITIS MEDIA/MASTOIDITIS**

- Failed treatment of acute otitis media, presents as chronic drainage from ear and decreased hearing. tm perforated
- Cholesteatoma can form from perforation or “retraction pocket” in TM. Erodes bone/ossicles
- Rx mastoidectomy + removing cholesteatoma
- Rx prolonged antibiotics
- NTM, Aspergillus, TB rare causes



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**CASE**

- A 22-year-old, male: two years of painless purulent drainage and progressive hearing loss in his right ear which is now profound. Treated numerous times with various antibacterial drugs for Staph aureus and Pseudomonas without improvement. He was born in Korea but has lived in San Francisco since age 11.
- Afebrile, no night sweats or weight loss. No remarkable physical findings or laboratory findings except for extensive granulation tissue and drainage in his right external auditory canal and a large tympanic membrane perforation. HIV testing is negative. CT Imaging of his chest is normal. CT scan: partial opacification of the right mastoid air cells.

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**Korean-borne man with 2 yrs painless ear drainage**

**What is the most likely cause of this chronic otitis?**

- A. Granulomatosis with polyangiitis (Wegeners)
- B. Syphilis
- C. Polychondritis
- D. Tuberculosis
- E. Actinomycosis

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## **ANSWER: D. TUBERCULOSIS**

### **• TB Otitis**

- Usually unilateral, relatively painless, progresses over months
- TM perforated. Drainage in canal. Mastoid fluid.
- May have preauricular adenopathy, ipsilateral facial palsy
- May extend to contiguous bone, brain
- Chest CT normal in half
- Dx. AFB smear, culture, PCR of drainage or biopsy

- **Granulomatosis with polyangiitis** (Wegener's granulomatosis). Similar picture but also lung, paranasal sinus or kidney disease

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## **CASE**

- 56 yr old woman with insulin dependent diabetes presents with 1 week of worsening right sided headache and a new onset horizontal diplopia, worse when looking to the right. For several weeks she has had chronic purulent drainage from her right ear.
- On exam she is afebrile. Otoloscopic exam reveals purulent otorrhea and a perforated tympanic membrane on the right. Neurologic exam show inability to abduct the right eye. Which of the following explains the mechanism of her neurologic findings.

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## **Woman with draining ear, headache and CN 6 palsy**

### **Mechanism of neurologic findings?**

- A. Reactivation of varicella-zoster virus in the geniculate ganglion
- B. Extension of middle ear infection to the petrous apex, involving the abducens nerve
- C. Invasive fungal infection of the external auditory canal
- D. Granulomatous inflammation of small and medium sized arteries
- E. Cavernous sinus thrombosis due to hematogenous spread

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**ANSWER: B. Extension of middle ear infection to the petrous apex, involving the abducens nerve**

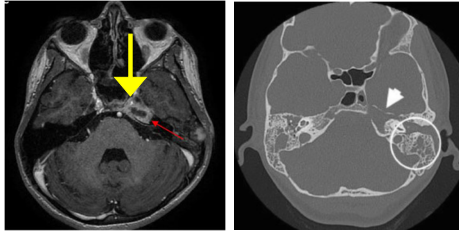
**DIAGNOSIS: Gradenigo syndrome, petrous apicitis**

- Subacute/chronic mastoiditis, (mastoid in circle below in CT)
- Infection extends medially to petrous pyramid (white arrow in CT)

- Abscess damages CN 6 (yellow arrow in MRI).

Rx IV antibiotics

Later: mastoid surgery



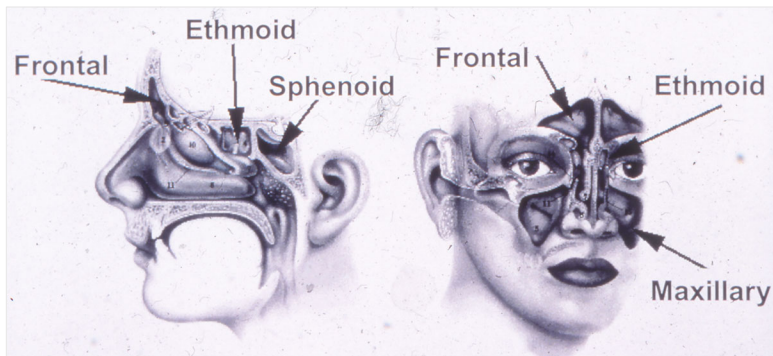
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## SINUSITIS



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## LOCATION OF THE SINUSES



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## CASE

- In January in Chicago, a 30-year-old woman in excellent health has had purulent nasal drainage, fevers to 38.5°C, sore throat, and chills for the past 12 days.
- She has been able to work and exercise on the treadmill as usual, but is easily fatigued. She saw her primary care physician after 5 days of symptoms, who was insistent that she did not need antibiotics because her symptoms were of short duration and likely would resolve without antibiotics.
- She comes to you as an ID physician for another opinion, a week after seeing her primary care physician.
- She has a temperature of 38.3°C with intermittent chills, moderate pain over her sinuses, and purulent-looking nasal discharge. Her WBC is normal. She has no drug allergies.

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## Healthy woman with acute sinusitis 12 days

What would be the best choice for management?

- A. Nasal decongestant and nasal irrigations with saline twice daily for 3-5 days but no antibiotics unless her clinical syndrome worsens
- B. Clindamycin
- C. Cephalexin
- D. Amoxicillin-clavulanate
- E. Ciprofloxacin

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## ANSWER: D. AMOXICILLIN-CLAVULANATE

Fever and 12 days suggests bacterial, despite normal WBC

Amoxicillin-clavulanate offers best coverage for Pneumococcus and beta-lactamase positive nontypable

Hemophilus influenzae and Moraxella.

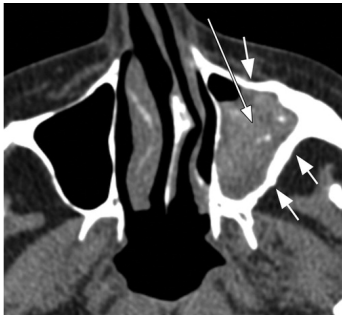
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### FUNGUS BALL OF THE SINUS

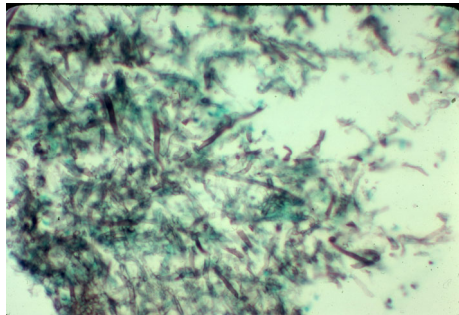
Aspergillus or other molds grow in mucus of chronically obstructed sinus.

Calcified clumps may appear.

Rx: curettage, antrostomy



Surgical specimens of fungus balls in the sinus have hyphae embedded in a matrix of debris



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## CASE

- An otolaryngologist referred an 18-year-old male from Baltimore following sinus surgery because hyphae were seen in the histopathology of sinus tissue.
- The patient had sought help from his internist for months of gradually increasing painless protrusion of his left eye. He had been otherwise well except for a history of hay fever and allergic rhinitis, for which he sometimes used nasal sprays with a decongestant or corticosteroid. On exam he was afebrile and had proptosis of his left eye. Visual acuity was normal. The internist ordered a sinus CT. The ethmoid sinus was full of tissue, the walls bulged into the orbit, causing the proptosis.

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## ACUTE FUNGAL SINUSITIS

- Covered in mycoses lecture
- Aspergillosis:
  - Prolonged neutropenia, transplant. Immunosuppressed
- Mucormycosis
  - Poorly controlled diabetes, neutropenia, immunosuppression

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## CASE

- A 23-year-old previously healthy female presents with a two-day history of a progressively red and painful right eye and low-grade fever. Her vision is slightly blurred. She has no history of local trauma or recent surgery and is aware of no other recent illness. She works in retail in Chicago. She is sexually active with a new male partner.
- On physical examination she is febrile to 38.3°C, and has a right ophthalmoplegia involving cranial nerves III, IV, and VI. The right eyelid is swollen and erythematous. Her right pupil reacts sluggishly to light. There is marked chemosis, periorcular edema and proptosis. The retina appears normal.
- His laboratory examination is normal except for WBC = 17000/mm<sup>3</sup> (90% neutrophils). HIV test is negative.

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2 days painful red swollen eye now blind, proptotic

The most likely diagnosis is which of the following?

- A. Staphylococcal blepharitis
- B. Gonococcal conjunctivitis
- C. Bacterial orbital cellulitis
- D. Bacterial preseptal cellulitis
- E. Behcet's disease



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## ANSWER: C. BACTERIAL ORBITAL CELLULITIS

- **Preseptal** infections: eyelids, conjunctiva, skin around eye
- **Postseptal** infections: intraorbital
- **Orbital cellulitis:**
  - usually originates from ethmoid sinus
  - fever, leukocytosis, vision loss
  - iv antibiotics, sinus surgery
- **Cavernous sinus thrombophlebitis:** similar presentation
  - vision loss late, high fever
  - source is sinus or face

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## Back to the monkeys

Too much  
information!

Too many  
slides!

Time to stop  
talking!



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