

ENT Infections

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Case 1

- 18 yr-old patient presents with L eyelid swelling, redness, and pain. He was well until 10 days ago, when he developed cold and sinus symptoms. Sinus pressure persisted, and this morning he awakened as shown.

Diagnosis

- Which of the following is his diagnosis?
 - Preseptal cellulitis
 - Orbital cellulitis
 - Orbital abscess

Case 1: Open the eyelids

- No orbital findings → preseptal cellulitis
- Orbital findings → much more serious
 - Involves orbital structures, so may threaten vision; always requires IV antibiotics and may require emergency surgery

Orbital Findings

- Any of the following:
 - pain with eye movement
 - limitation of EOM
 - proptosis (may not be apparent; 2mm difference of Hertel's)
 - decreased vision

Case 1: Diagnosis

- L eye: vision 20/20, full extraocular movements, no proptosis, normal fundus
- Therefore, no orbital findings.
- Diagnosis: preseptal cellulitis.

Preseptal cellulitis: etiology

1. Acute sinusitis (80-90% of cases)
(*S. pneumoniae*, *H. influenzae*)
2. Superinfection of lid skin abrasion or rash (*S. aureus*, group A strep)
3. Rarely, bacteremic seeding in young children (< 3 yrs old)
(*S. pneumoniae*, group A strep, unencapsulated *H. influenzae*)

Case 1: What if orbital findings had been present?

- Then the differential diagnosis would have included:
 - Orbital cellulitis
 - Subperiosteal abscess
 - Orbital abscess

Orbital Cellulitis

- Orbital fat is infected, but no abscess
- Swollen, red eyelids
- Proptosis or ophthalmoplegia or both
- Fever (70% children, 30% adults)
- CT: stranding in orbital fat but no abscess
- Rx: IV antibiotics

Subperiosteal or orbital abscess

- Symptoms and findings are similar to orbital cellulitis, though often more severe
- Eye may be fixed “down and out” (reflects ethmoid sinus as source of infection)
- CT shows abscess
- Cultures: mixture of *S. aureus*, streptococci (*Strep milleri*), GNR's (e.g. *Klebsiella*), anaerobes
- Rx – surgical drainage, IV antibiotics

Orbital complications of sinusitis

- Usually due to acute bacterial sinusitis
- Children >> adults
- 5 categories:
 - Preseptal cellulitis (90-95% of total)
 - Orbital cellulitis (2-10%)
 - Subperiosteal abscess (2-10%)
 - Orbital abscess (<1%)
 - Cavernous sinus thrombophlebitis (rare)

Ethmoid sinusitis and orbital complications

- Why is the ethmoid sinus the most common source of infection in preseptal and orbital infections?

Case 2

- 40 yr-old man with IDDM developed fever 101 and vertex HA 10 days ago. 8 days ago, he developed R eyelid swelling. 5 days ago, he was admitted, Rx ampicillin-sulbactam + ciprofloxacin. 3 d ago, he developed numbness R forehead and cheek. ENT: normal nasal mucosa. CT: R ethmoid and max. sinus opacification. Yesterday, he developed R CN 6 palsy. He is transferred to you today.

Case 2 (continued)

- PE: NAD, alert, conversant. c/o R vertex HA. T 96, VSS.
 - R eye: marked lid swelling, minimal erythema, nontender; Va 20/70
 - Face: medial R cheek induration
 - Neuro: EOM's limited (up, down, lat), decreased sensation R forehead, cheek
 - ENT exam: normal except minimal R sinus purulence. Normal nasal mucosa (no eschars)

Case 2

- What do you recommend?

OR findings

- Healthy-appearing nasal and sinus mucosa
- R middle turbinate biopsied; tissue bled normally
- Frozen section positive

Rhinocerebral mucor: risk factors

- diabetes (70%)
- hematologic malignancies
- s/p transplant, on immunosuppression
- chronic steroid therapy
- deferoxamine (for Fe overload)
- voriconazole prophylaxis (in leukemia and BMT patients, Kontoyiannis D, J Infect Disease, April 15, 2005)

Mucor: clinical features

- pain: periorbital or forehead (pain is usually confined to orbit in orbital cellulitis)
- fever, but not always; nontoxic
- proptosis, lid edema, limitation of EOM's; mimics orbital cellulitis, but not as red
- CN 5 (decreased V1, V2); rarely CN 7
- nasal turbinate black eschar, but not always

Fungal Sinusitis: 3 categories

- invasive fungal sinusitis
 - mucormycosis
 - invasive sphenoid aspergillosis
- sinus aspergilloma
- allergic fungal sinusitis

Sinus aspergilloma

- Can occur in any sinus but typically in sphenoid or maxillary
- No symptoms of invasion: only symptoms of chronic sinusitis (congestion, sinus HA, discharge)
- At surgery, cheesy material: pathology shows a fungus ball, no tissue invasion. Rx is surgery only.

Allergic Fungal Sinusitis

- Symptoms of chronic sinusitis; may cause tumor-like expansion of sinus
- Thick “allergic” mucin found in OR
- Pathology: sea of eosinophils, +/- hyphae; cultures negative about 50% of the time
 - no evidence of tissue invasion
- Dematiaceous fungi (*Bipolaris*, *Curvularia*), *Aspergillus*

Chronic sinusitis

- Common
- Etiology is unknown, but most likely allergy-based rather than infection
- End result is decreased mucociliary clearance

Chronic Sinusitis: a common condition in the U.S.

- orthopedic impairments 35 million
- chronic sinusitis 33.7 million
- arthritis 31.8 million
- hypertension 27.6 million

Collins JG. Vital Health Stat 10; 1997:194:1-89.

Chronic sinusitis: surgical treatment

- Indicated particularly for sinuses where obstruction of mucus outflow can be dangerous – frontal sinusitis, sphenoid sinusitis
- Obtain CT in all patients with chronic sinusitis

Chronic sinusitis and therapy

- The benefit of antibiotics is unknown
- No antibiotics have FDA approval for use in chronic sinusitis (only acute sinusitis)
- Short courses can be used to treat acute exacerbations of sinusitis
- Nasal irrigations with saline or water may help with chronic symptoms

Chronic Sinusitis: Bacteriology

- conflicting data
 - anaerobes 2-100%
 - S. aureus (a pathogen or nasal colonizer?)
 - GNR's (reflects chronic antibiotic use?)
 - coag-neg staphylococci are not pathogens
- cultures in chronic sinusitis are always positive (nasal contamination), and don't mean the patient has an infection

Chronic sinusitis and fungi

- Mayo Clinic 9/99 (Ponikau et al) argued that all cases of chronic sinusitis are a variant of allergic fungal sinusitis
- Cultures of nasal washings grew molds in 96% of 210 patients with chronic sinusitis, but also in 100% of 14 normal controls
- It was postulated that fungi provoked a local immune response in chronic sinusitis patients but not in controls, leading to sx's

Chronic sinusitis and antifungal treatment

- 2007 (Ebbens, Netherlands): multicenter randomized placebo-controlled trial x 13 wks of amphotericin nasal irrigations. No benefit either in symptom score or CT findings.
- 2009 study (Ebbens): Also no benefit in reducing concentration of cytokines, chemokines, or growth factors in nasal lavage samples.

Chronic sinusitis and antifungal therapy

- 3/08 (Accentia Pharm, U.S.): Phase 3 trial, amphotericin 0.01% nasal irrigation vs placebo irrigation x 16 wks, 299 patients. No benefit of amphotericin solution over control ($p=0.14$).
- Control irrigations were more effective than expected: they also led to decrease in polyps and improved CT findings

Case 3: Chronic Sinusitis

- 50 yr-old businessman with allergies x 20 yrs, multiple sinus surgeries x 7 years (including frontal obliteration)
- 2 yrs. recurrent flares, 14x antibiotics, prednisone 1x, now nasal culture with *S. epi.*, *Bacillus*, *Rhizopus*, *Alternaria*
- Symptoms: only congestion and “sinus” pressure; CT unchanged (chronic thickening)

Case 3, continued

- Referred to MEEI for evaluation
- We recommended: no antibiotics, no surgery
- Only Rx nasal irrigations bid
- 6 month follow up: uses bulb syringe in shower daily. Felt well, had only 5-day antibiotic course in 6 months.

Aminoglycoside Ototoxicity

- cochlear damage: high-frequency loss in up to 60%, overall 3-14%
- cumulative dose most important
- ototoxicity is independent of nephrotoxicity
- irreversible; onset occur after end of Rx
- vestibular damage incapacitating

Aminoglycosides

- Consider potential ototoxicity
- Monitor hearing tests if 2 weeks or more of aminoglycoside therapy is anticipated

Case 4: An unusual case

- 40 yr-old man presents with 2 months of drenching night sweats, fatigue, and enlarging L neck mass. Symptoms began with a febrile flu-like illness in September, one week after starting work as a hunting guide in New Mexico. He had been bitten by many insects, including deer flies. The neck mass had gradually increased over 2 months, and was mildly tender and uncomfortable but not painful. He had frequent night sweats. PPD and CXR are negative.

Case 4

- Diagnosis?
