ENT Emergencies

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No Disclosures

Learning Objectives

• Recognize assessment findings consistent with the following common ENT emergencies: complicated otitis (mastoiditis, intracranial abscess, facial nerve paralysis), auricular hematoma, nasal fracture, complications of sinusitis, mucormycosis.
• Identify assessment findings consistent with peritonsillar abscess, retropharyngeal abscess, Ludwig’s angina, periorbital cellulitis, angioedema, adult epiglottitis.
• Order appropriate workup and perform appropriate intervention and referral when indicated for the emergencies discussed in this lecture.
Auricular Hematoma

- Result from blunt force trauma, usually from sports
- Blood accumulates in the sub-perichondrial space and can result in decreased blood flow, cartilaginous necrosis and infection.
  - Prompt I&D essential to management
- Cauliflower ear is the resulting deformity due to a delay in evacuating and treating an auricular hematoma


Auricular Hematoma

- History of traumatic blow
- Tender, fluctuant mass
- Differential diagnosis included perichondritis, abscess, relapsing polychondritis
- Prompt evacuation within 7-10 days*
- Various techniques for compression dressing to prevent re-accumulation


Large left auricular hematoma filling the concha and occluding the external acoustic meatus

Auricular Hematoma - Treatment

- Local / regional anesthesia
  - 1-2% lidocaine w/ epinephrine
- Auricular block works well
- I&D vs Needle Aspiration vs penrose
- Compression dressing to prevent re-accumulation
  - Dental rolls
  - Casting agent (Aquaplast)
  - Mattress sutures

Ballenger’s Otorhinolaryngology: Head and Neck Surgery
Auricular hematoma - Treatment

- Antibiotic coverage
  - Cephalexin
  - Antipseudomonal Rx
    - Levofloxacin
    - Ciprofloxacin
  - Amoxicillin / Clavulanic acid – children
  - Patients should be followed closely to assess for re-accumulation and infection

Epistaxis

- Anterior and Posterior Epistaxis presentation and management are covered in the Common Nasal Sinus lecture by Marie Gilbert, PA-C
Complications of Acute Otitis Media (AOM)

- Drastic decrease with antibiotic use
- High morbidity / mortality
- 3 routes of spread
  - Direct extension
  - Thrombophlebitis
  - Hematogenous spread

Complications

- Chronic suppurative otitis media
- Mastoiditis
- Facial nerve paralysis / paresis
- Post-auricular abscess
- Intracranial abscess
- Meningitis
- Sigmoid sinus thrombosis
- Labrynthitis / labyrinthine fistula


Symptoms of complicated AOM

- History:
  - Severe otalgia (worse e/immunocompromised)
  - Vertigo
  - Fever / malaise
  - Nausea / vomiting
  - Headache
  - Mental status changes
  - Profuse otorrhea (often foul-smelling)

- Physical Examination
  - Fever / lethargy
  - Focal neurologic deficits
    - Ataxia, meningeal signs, ocular palsy
  - Mastoid tenderness / abscess
  - Facial nerve paresis
  - Papilledema
  - Otorrhea / granulation tissue / aural polyp

Chronic Suppurative Otitis Media

- Chronic middle ear drainage with tympanic membrane perforation
- Chronic inflammation -> edema -> infection (pseudomonas, staph)
- Can lead to bony destruction
- 0.3 – 0.9 / 100,000 patients
- Work-up
  - Audiogram
  - High-resolution CT scan c/o cholesteatoma
  - Tc
    - Otic drops (quinolone 1st line)
    - Frequent aural toilet

Source: Benjamin Ear Atlas


Mastoiditis

- Acute mastoiditis seen in conjunction with AOM
- S. pneumoniae, m. otitidis, h. influenzae, a. aureus, G/ A. stephan
  - Increase in AMD m. pneumoniae
- Usually < 2 yrs old +/- h/o ODM
- 4 cases / 100k / yr
- Approx 7% develop intracranial complications

- Surgical disease - mastoidectomy


Mastoiditis cont.

- Presentation
  - Large % w/o history of recent AOM
  - Persistent otorhea
  - +/- High, unbreakable fevers
  - Mastoid tenderness
  - Hearing loss
  - Children with high WBC more likely to have complications

- Work-up
  - CBC
  - * High WBC in kids assoc with inc. complications
  - Blood cultures
  - Ear cultures / tympanocentesis
  - Audiometry
  - High resolution CT scan attention to orbits / temporal bone
  - TX:
    - Surgery
    - IV antibiotics / otic drops


Mastoiditis Antibiotics

- Linezolid (zyvox)
- Cefepime (Maxipem)
- Vancomycin
- Clindamycin (Cleocin)
- Meropenem (Merrem)
- Piperacillin / tazobactam (Zosyn)
- Oxacillin
- Ceftiraxone (Rocephin)
  - Up to 30% resistance in post-pneumococcal vaccine era

- Otic drops (adjuvant therapy)
  - Ciprofloxacin with or without steroid (Cipro HC, Ciproflox, Cortisporin otic, Tobradex)

Acute mastoiditis with soft tissue abscess and intracranial abscess

Yellow arrowheads = soft tissue abscess
Red arrowhead = intracranial abscess
Sagittal CT showing mastoid dehiscence and intracranial abscess formation

FACIAL NERVE PARALYSIS

Causes of Facial Nerve Paralysis

- Bells Palsy
- Ramsey Hunt Syndrome
- Bacterial infection (AOM, mastoiditis)
- Lyme Disease – up to 10% Lyme patient with 25% being bilateral*
- Trauma
  - At birth (forceps) penetrating ear trauma
  - Temporal bone fracture barotrauma
- Non-infectious causes:
  - Tumor – cholesteatoma, FN tumor, parotid tumor
  - Iatrogenic – e.g. parotid, neck surgery

Bells Palsy

- **Bells Palsy** defined as “acute, unilateral facial nerve paresis (weakness) or paralysis (complete loss of movement) with onset in less than 72 hours and without an identifiable cause”

- Self-limited

- Diagnosis of exclusion

- Please refer to lecture on Bells Palsy Guidelines – Debra Munsell

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Ramsey-Hunt Syndrome

- Acute peripheral facial neuropathy affecting the auricle, external auditory canal or the mucous membranes of the oropharynx*

- +/- skin vesicles / ulcerations

- Varicella-Zoster virus (Shingles) affects the geniculate ganglion

- May be cause of up to 20% of bells palsy cases**

- Facial paralysis, hearing loss, vertigo, tinnitus, ataxia may be presenting sxs

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Ramsey – Hunt Syndrome

63 yf consult for “ear pain”
### Ramsey-Hunt Presentation / work-up

- **Presentation:**
  - Paroxysmal pain deep in ear canal
  - Vesicular ear or mouth ulcers / preceded with pain preceding rash by hours to days
  - Facial paresis / paralysis
  - Unilateral ear pain / tinnitus (up to 50%)
  - Hearing loss (unilateral)
  - Headache

- **Diagnosis often obvious**
  - WBC, ESR to r/o infection / inflammation
  - If CNS involvement (ie meningitis) suspected, CSF may be needed
  - Imaging – CT / MRI to r/o structural lesions
  - Viral studies
    - Tzanck smear
    - Cultures (low specificity)
    - Direct immunofluorescence assay (DFA) has high sens/spec


### Ramsey- Hunt Treatment

- 50-60% chance of recovery of facial nerve
- Corticosteroids and antivirals are the mainstay of treatment
- Pain control
- Eye care extremely important!
- Vestibular suppressants may be necessary for vertiginous sxs
- Carbamazepine and other neurologic agents may also be used
- No role for surgical decompression of the nerve


### Eye Care

- **Same patient from previous slide. Not ability to close Right eye**

- **Corneal ulceration**
- **Moisture chamber**
Facial Nerve paresis / paralysis - complication of otitis media

- Uncommon complication but need for recognition
- Need to r/o other causes (VZV^)
- AOM results in inflammation of the facial nerve
- Most patients will recover within 1st year
- Treatment includes po / IV antibiotics
- Myringotomy with tube followed by otic drops

References:

Case 1:
A 2 yo presented to ER with 3 days of facial asymmetry following episode of AOM.

Case 2:
A 58 yo wm presents with 24 hrs of facial weakness after previous dx w/ acute sinusitis.
CT of the head in ER was “negative for Stroke”
Patient given a diagnosis of Bells Palsy and told to stay on antibiotics.

Follow-up:
3 weeks later follows up in ENT office
Persistent facial nerve dysfunction (House-Brackman 5-6/6) with evidence of AOM on ear exam.
Facial Nerve Paralysis cont.

- No evidence of hearing loss or vertigo
- Ventilation tube placed and ear aspirate cultured
  - Grew methicillin-resistant S. aureus
- Placed on Ciprofloxacin gtt and Augmentin initially, changed to Bactrim DS
- Patient followed over 5 year period. No improvement after 18 months. Slow improvement starting at 2 years
- Currently only faint marginal mandibular weakness

Misc causes of facial nerve paralysis

Left parotid mass Cholesteatoma

Facial nerve weakness and severe unilateral hearing loss 3 weeks after a fall

Battle's sign – indicative of temporal bone fracture
Nasal Fracture

- Very Common
  - Most common facial fracture
  - 3rd most fractured bone
- High index of suspicion for fracture
  - Mechanism, Change in appearance
  - Epistaxis, Nasal obstruction
- Examine and palpate nose carefully
  - Instability, Mobility, Crepitation
  - Lacerations, Septal hematoma
- Nasal X-rays- variable reliability
- Early ENT referral (<5 days)
  - Closed/ Open reduction- early
  - Septorhinoplasty- late

Nasal Fracture Management

Nasal X-Ray

Closed Reduction

Nasal Bone Fracture

- Treatment:
  - Observation
  - Early referral! <5 days
  - Closed reduction – Early intervention (<10 d)
    - in-office vs outpatient
  - Septo/rhinoplasty - late
- Complications
  - Septal hematoma
  - Nasal obstruction
Septal Hematoma

- Rare complication of NB fx
- Usually present with nasal obstruction and blue-erythematous bulge from nasal septum (unilateral or bilateral)
- Prompt I&D and packing are crucial to prevent cartilaginous necrosis of septum / saddle deformity

1. A 2 yr old who presented 3 weeks after being kicked by a horse...had presented to ER 5 days after initial visit with c/o inability to breath through nose

2. Canty PA, Berkowitz RG. Hematoma and abscess of the nasal septum in children. Arch Otolaryngol Head Neck Surg 1996;122:1373-6. 2 yr old who presented 3 weeks after being kicked by a horse...had presented to ER 5 days after initial visit with c/o inability to breath through nose

Nasal Fracture

Complications

Septal Hematoma with overlying edema and occlusion of nare

Septal Hematoma

Septal perforation following a missed hematoma
Orbital Blow Out Fracture

- 2nd most common mid-facial fracture (nasal bone 1st)
- Inferior wall (maxillary sinus) and Medial wall (ethmoid sinus)
- Waters view X-Ray may show fluid in maxillary sinus
- CT diagnostic
- +/- subcutaneous emphysema
- Entrapment of inferior rectus muscle can restrict eye movement causing diplopia
  - Immediate referral for surgical repair, otherwise 3-10 days

Orbital Blow-out Fracture

- Treatment:
  - Surgical repair of orbital floor
  - Observation
  - Antibiotics in ED
    - Cephalexin 500 QID x 10d
  - Referral to ophthalmology
  - 1/3 of all orbital blow out fractures with normal initial eye exam will have underlying ocular trauma
    - Abrasion, traumatic iritis, hyphema, retinal tear / detachment

Orbital blow-out fracture

- Minimally displaced fracture orbital floor
- Blood in maxillary sinus (arrow) Orbital contents dropping into maxillary sinus (arrowheads)
Orbital Floor Fracture Evaluation

Neutral Gaze

Upward Gaze

Sudden Sensorineural Hearing Loss (SSNHL)

- Rapid-onset of subjective hearing loss [within 72 hrs] in 1 or both ears
  - May only complain of “blocked” or “plugged” ear
  - May be only sign of serious problem
  - Vertigo +/- assoc w/ worse prognosis
- At least 50dB loss in 3 consecutive frequencies
- 5-20 / 100k people 4000 cases / yr

  - Cause only identifiable 10-15% of the time at presentation**
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Etiologies:

- Infectious
  - Viral*, meningitis, Lyme disease, syphilis
- Medication
  - Aminoglycosides, chemotherapeutics, antimalarials, loop diuretics
- Trauma
  - Temporal bone fx, barotrauma
- Neoplasm
  - Acoustic neuroma (2-10% of SSNHL)
- Autoimmune
  - Vascular (ECV, cochlear infarct)
- Infarctive
  - Utri, autoimmune, vascular

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Sudden Sensorineural Hearing Loss

- **Physical Exam**
  - Tuning forks (Weber, Rinne)
- **Work-up**
  - C/I for treatable etiology
  - Audiogram
  - Blood tests not routine
  - MRI with gadolinium contrast to the IACs (orbits)
  - ABR – not as sensitive as MRI

- **Distinguish SSNHL and acute CVA based on neurological findings**
  - Ataxia
  - Facial weakness
  - Unilateral Horner’s syndrome
  - Diplopia

- CT scanning not recommended for routine work-up of SSNHL unless neurological findings suggest otherwise

- **Physical Exam**
  - Tuning forks (Weber, Rinne)
  - Pneumatic otoscopy

- **Work-up**
  - PTA for treatable etiology
  - Audiogram
  - Blood tests not routine
  - MRI with gadolinium contrast to the IACs (orbits)
  - ABR

- **Treatment**
  - Oral glucocorticoids – high dose
    - Prednisone 1mg/kg (60mg taper)
    - Dexamethasone 16mg/d
    - Methylprednisolone 48mg/d
  - Trans-tympanic membrane glucocorticoid injection
    - Dexamethasone 24, 16 or 10mg/ml
    - Roughly 0.5ml
    - Repeat q3-7 days for 3-4 weeks
    - Monitor with serial audiograms

- **Prognosis**
  - Worse if HL profound
  - If no improvement at 3 mos, usually will not improve
  - Approx 2/3 of SSNHL patients experience some degree of recovery
  - Often within 10 days
  - Follow up audiogram at 6 months
  - Patient education and counseling are integral parts of treatment

SSNHL - Treatment

Peritonsillar Abscess

- Complication of acute suppurative tonsillitis
- Accumulation of pusulent debris in the potential space between tonsil capsule and pharyngeal musculature
- Often a history of recurrent tonsillitis but not necessarily
- 30 cases per 100k in US
- No race or sex predilection
- Usually 3rd-4th decades and children over 10
- Strep and anaerobes most common
Peritonsillar Abscess

**Symptoms**
- Malaise
- Fever
- Sever pain – "razor blades"
- Drooling
- Trismus
- "hot potatoe" voice
- Referred ear pain
- Dehydration

**Physical Exam**
- +/- Fever
- Appear uncomfor
- Trismus
- Symmetry of tonsillar pole often with bulging and displacement of the uvula to the midline or contralateral side
- +/- palpable fluctuance in tonsillar bed
- Halitosis
- Cervical adenopathy

**Work-up:**
- Rapid Strep / culture
- Monospot
- CBC
- Computed tomography is frequently used in the emergency setting, however this can often be avoided by ENT consultation when available. *
- Trans-oral US also of utility in trained hands


**Treatment**
- Broad-spectrum antibiotics with good anaerobic coverage
  - Augmentin or Clindamycin po
  - Ceftriazone or Clindamycin IV
- Corticosteroids for severe swelling / edema
  - Decreased pain *
- Needle aspiration with large bore needle
- Open I&D
- Quinsy tonsillectomy
- IV fluid for rehydration

Retropharyngeal Abscess

- Deep neck infection secondary to suppurative pharyngitis
- Children > adults
- High morbidity and mortality if left untreated.
- Group B strep, anaerobes, and gram negative species most common.
- MRSA on the rise


Large inferior pharyngeal abscess (extraoral)

Retropharyngeal Abscess

- Work-up / Management
  - Secure airway / supplemental O2
  - CBC, blood cultures
  - CRP > 100 may be indicative of complications and increased hospital stay*
  - Lateral neck film may not be sensitive enough — use clinical suspicion
  - A-P diameter of pre-vertebral soft tissue should not exceed that of the vertebral bodies
  - CT w/ IV contrast is gold standard


False Positive Lateral Neck X-Ray
CT with Contrast
Retropharyngeal Abscess

- **Treatment**
  - Aggressive IV antibiotic therapy
  - Tracheostomy may be required for airway compromise
  - Majority will require either needle aspiration or surgical I&D

  - Review of 162 patients at St. Louis CHP revealed 126 required initial surgical intervention and of 36 observed, 17 subsequently required surgery.

- **Medications**
  - Clindamycin + metronidazole
  - Pen G + metronidazole
  - Cefoxitin
  - Ticarcillin and clavulanic acid (Timentin)
  - Piperacillin and tazobactam (Zosyn)


The Red Herring Tonsil

- 45 male presents with 1 mo h/o worsening difficulty swallowing and enlarged left tonsil on exam.
- Referred from urgent care with dx of PTA
  - No fever, Normal WBC
  - Minimal throat pain
  - Moderate trismus
  - No referred otalgia
  - Non-smoker
  - Left neck nodes enlarged but non-tender

Primary Lymphoma of the Tonsil

Dental Abscess

- Common entity often encountered in the primary care / ER setting
- Periapical – originates in pulp secondary to caries (kids)
- Periodontal – usually due to impacted FB / food in the gingiva
- No race or sex predilection
- Present with localized pain / swelling, occasional fever
- Bacteroides, Fusobacterium, Actinomycetes, Peptococcus, Peptostreptococcus, Strep viridans, Prevotella oralis

Rectant area in gingival sulcus underlying 1st L maxillary premolar #12 - note dental caries
Dental Abscess – Workup / Treatment

- No workup necessary if uncomplicated – tear.
- Complicated Abscess:
  - CBC
  - Blood cultures
  - Aerobic / anaerobic
  - Needle aspiration or open I&D with cultures (aerobic / anaerobic)

- Treatment
  - Assess airway if severe presentation
  - I&D facilitates rapid resolution
  - Empiric broad-spectrum antibiotic coverage
  - Parenteral antibiotics if complicated (ie facial cellulitis)
  - Antibiotics:
    - IV clindamycin
    - Amoxicillin / clavulanate
    - Gentamicin
    - Ceftriaxone
  - PCN – not sufficient coverage
  - 30% beta-lactamase + organisms
  - Can add metronidazole or azithromycin

- Facial Cellulitis – complication of dental abscess

- Patient from previous images:
  - C/o facial pain, HA and malaise
  - Had low grade fever 100.1 F
  - WBC of 26,000
  - Mild infra-orbital erythema/edema

- Treatment:
  - I&D as above
  - IV clindamycin 900mg TID
  - Referral to tertiary oral surgery service
Ludwig’s Angina

- Submandibular/Sublingual Infection
  - Odontogenic Source (70%)
  - Edema/Induration /hour of onset
- Management
  - Secure Airway Early
    - Rapid progression common
    - Respiratory distress (>25%)
    - Panorex/CT with Contrast
    - Determine source and extent of infection
    - IV antibiotics: Strep, anaerobes
    - - MRSA on the rise
    - I&D
    - +/- Tracheotomy


Ludwig’s Angina

Radiology

Periapical Abscess
Submandibular Abscess

Deep Neck Space Infections

- Source of infection
  - Pediatric: tonsil/sinus/orbit
  - Adult: teeth/salivary glands
  - Unidentified source (50%)
- Signs and Symptoms depend on space
  - Fever, Pain, Swelling (>60%)
  - Dysphagia, Trismus (18%)
  - Fluctuance: uncommon (23%)
- Microbiology
  - Strep and Staph: most common
  - Gram negative
  - Mixed flora (40%)
  - Anaerobes

Left Neck Abscess
**Deep Neck Space Infections: Management**

- Secure airway - as needed
- CT scan with contrast
  - Cellulitis vs. Abscess
  - Identifies neck space involved
- Cultures: blood and aspirates
- IV antibiotics
  - Oribrous abscess
  - Failure to improve on antibiotics
  - Impending complication
- Complications:
  - Mediastinitis, Sepsis, IT thrombosis
  - Osteomyelitis (mandible, C-spine)
  - Cerebrovascular complications

**Severe Facial / Deep Neck Infection**

28 yo wf status post dental extraction. Presented with increasing pain, swelling and erythema of left face and neck...continued despite p.o. clindamycin.

Required tracheostomy and debridement x5 over 7 days
Penrose drains placed in lat canthus of eye and intra-orally

**Angioedema**

- Acute painless mucosal edema
  - Face, Lips, Tongue, Larynx
  - Airway obstruction: 20%
- Etiology
  - ACE Inhibitor: most common
  - Hereditary Angioedema: rare
  - Idiopathic: unknown trigger (allergic reaction?)
- Aggressive Early Treatment - Required
  - Secure Airway Early
  - Epinephrine (airway compromise), Corticosteroids, Antihistamines
  - Discontinue ACE inhibitors, NSAIDs
  - Medical consult: blood pressure control

Early angioedema of the uvula attributed to NSAID intake
Sinusitis: Complications
Orbital

- Young Children/ Ethmoiditis
- Signs and Symptoms
  Lid edema, Chemosis, Proptosis, Ophthalmoplegia, Visual loss
- CT with Contrast
  Subperiosteal Abcess vs. Abscess
- Management
  - IV Antibiotics- Strep, Staph
  - Ophthalmologic Evaluation
  - Surgery:
    - Ethmoidectomy
    - Orbital Drainage
Sinusitis: Complications

Orbital

- Young Adults - commonly
  - Frontal or Paranasal sinusitis
  - Meningitis, Epidural abscess

Sinusitis: Complications

Intracranial

- Young Adults - commonly
  - Frontal or Paranasal sinusitis
  - Meningitis, Epidural abscess
- Signs and Symptoms
  - Severe headache, Fever, X MS
  - Nuchal rigidity, Seizure, Coma
- CT with contrast/ MRI
- Lumbar Puncture
- Urgent Consultation
  - ENT/Neurosurgery

Sinusitis: Complications

Intracranial and Local

- Brain Abscess
- Frontal Bone Osteomyelitis
Sinusitis: Complications
Immunocompromised Host

- Sinusitis Common
  - HIV/AIDS: 75%
  - Chemotherapy/Neutropenia
- Signs and Symptoms
  - Fever, Progressive symptoms
  - Poor response to antibiotics
- Management
  - Culture Directed Therapy
  - Early CT/IV Antibiotics
  - Infectious Disease Consultation

Sinusitis: Complications
Invasive Fungal Rhinosinusitis (mucormycosis)

- Immunocompromised Patient
  - Uncontrolled diabetic (ketoacidosis)
  - Oncologic patient (neutropenia)
- Few symptoms - discharge, pain
- Intranasal exam - blackened mucosa
- CT/MRI to evaluate invasion
- Tx*: aggressive surgical debridement
  - Antifungal agents - amphotericin B, posaconazole
- Prognosis - very poor
  - Correct underlying immunodeficiency
  - Control blood sugar

Selected References
3. http://oto.sagepub.com
5. Complications of Otitis Media
References continued