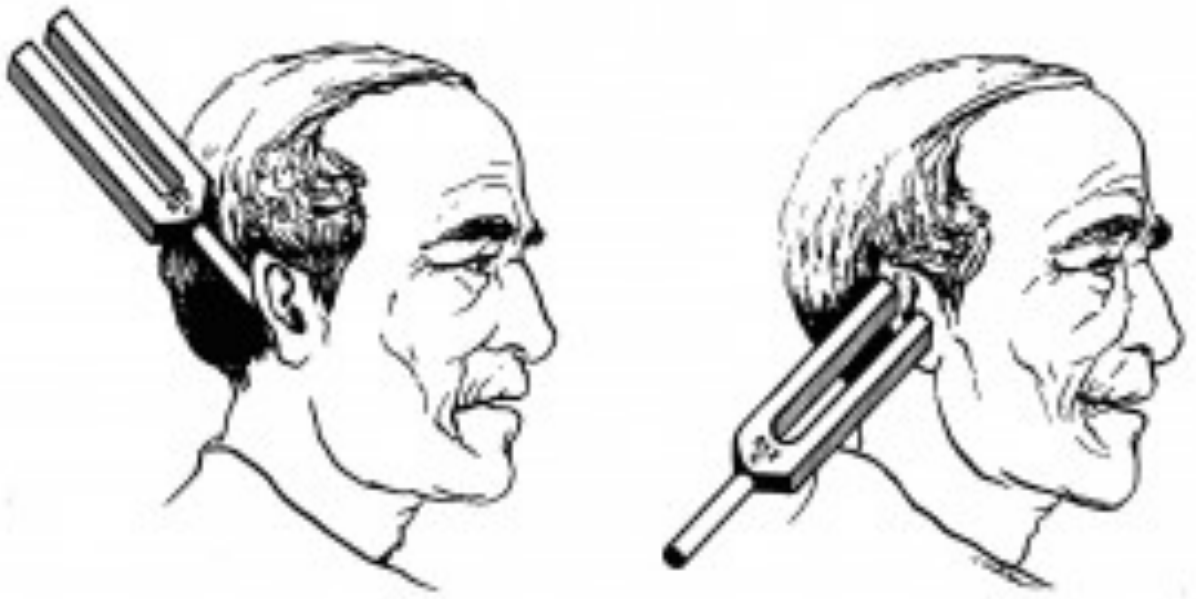
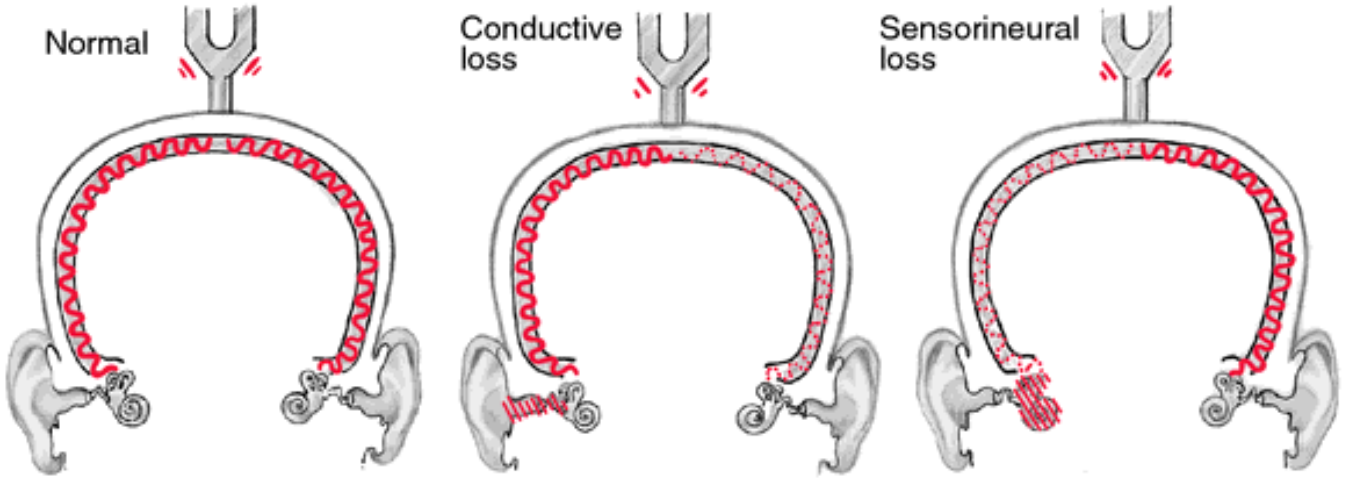
# Hearing Loss Tests (1)

- Causes: Air conduction or nerve disease
- Rinne test (Rinne Rings Right Next to the Ear)
  - Tuning fork on mastoid, then next to ear
  - Normal: air conduction better than bone
  - Bone > air indicates air conduction deficit



# Hearing Loss Tests (2)

- Causes: Air conduction or nerve disease
- Weber test (Weber Wrinkles Forehead)
  - Tuning fork on forehead (normally sounds equally loud in both ears)
  - If sound lateralizes to one ear: Decreased nerve conduction in bad ear, or decreased air conduction in louder ear (yes, the louder ear)

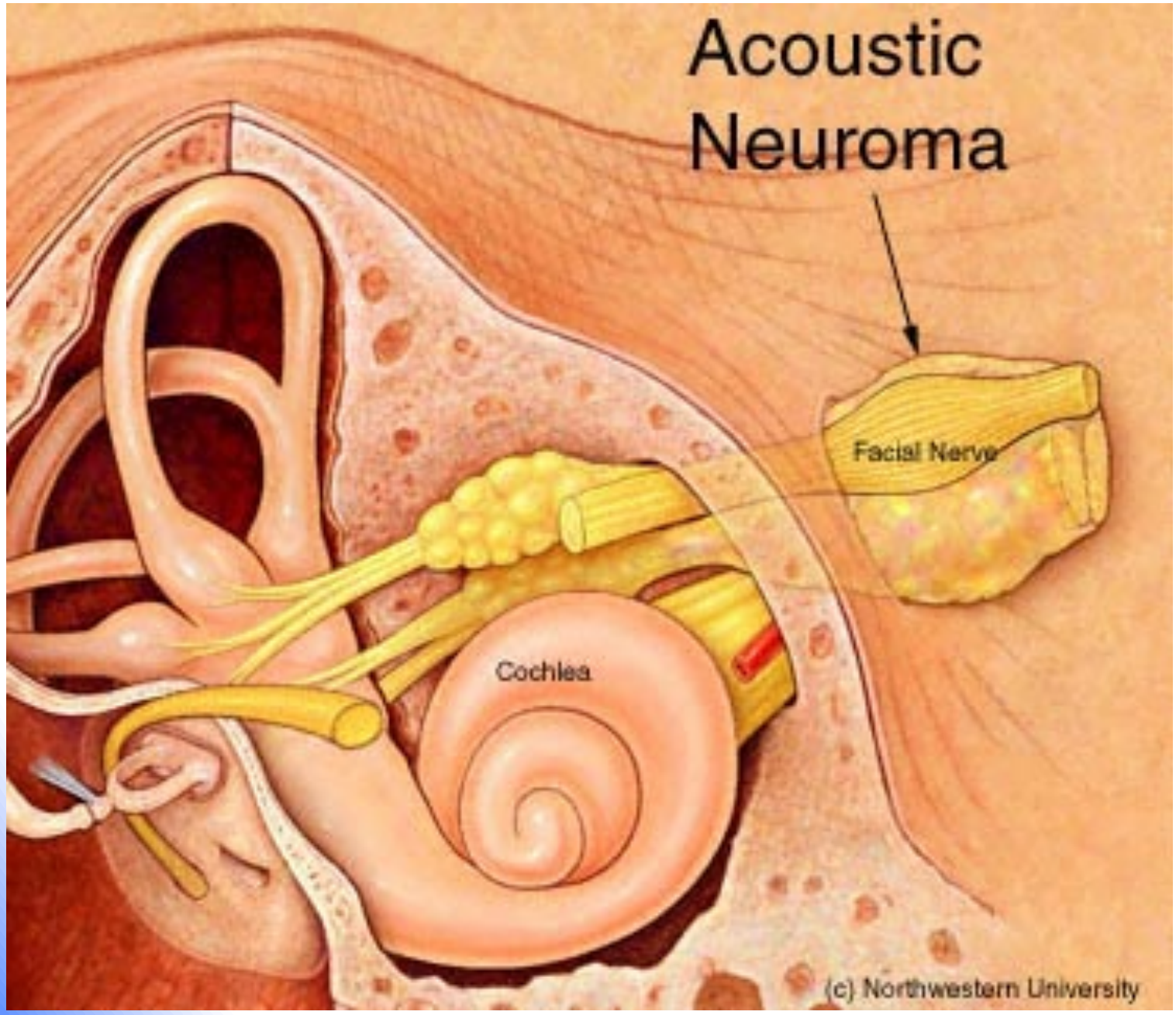


# Sudden Hearing Loss

- Usually cause = sensorineural = most cases are idiopathic / isolated tinnitus often has the same causes / about 4,000 cases a year
- Greater than a 30db loss (half as loud as normal speech) in 3 frequencies over 72 hours or less
- Rarely is sudden, usually evolves over hours
- Usually unilateral (90%), 1/3 awaken with it
- If bilateral you can get decreased hearing loss but normal Weber and Rinne tests
- Often accompanied by tinnitus and vertigo
- Tests worth considering if sensorineural loss is the probable cause:
  - MRI – tumors, CSF leak, stroke
  - Lab – CBC, sed. rate, FTA (syphilis)

# Sudden Hearing Loss Causes (1)

- Sensorineural causes
  - Viral & bacterial infections
    - Mumps in children, Herpes zoster, Epstein-Barr, cytomegalovirus, syphilis
  - Hematologic and vascular (terminal arteries)
    - Leukemia, sickle cell, polycythemia (all sludging)
  - Metabolic
    - Diabetes, hyperlipidemia
  - Rheumatologic
    - Temporal arteritis, polyarteritis
  - Other
    - Noise, Ménière's disease, temporal bone trauma
    - Acoustic neuroma (schwannoma)– benign tumor of the myelin forming cells (Schwann) of the 8$^{th}$ nerve (often associated with other cranial nerve deficits)
- Treatment – treat cause if known / steroids / carbogen (95% $O_2$, 5% $CO_2$ - vasodilates )



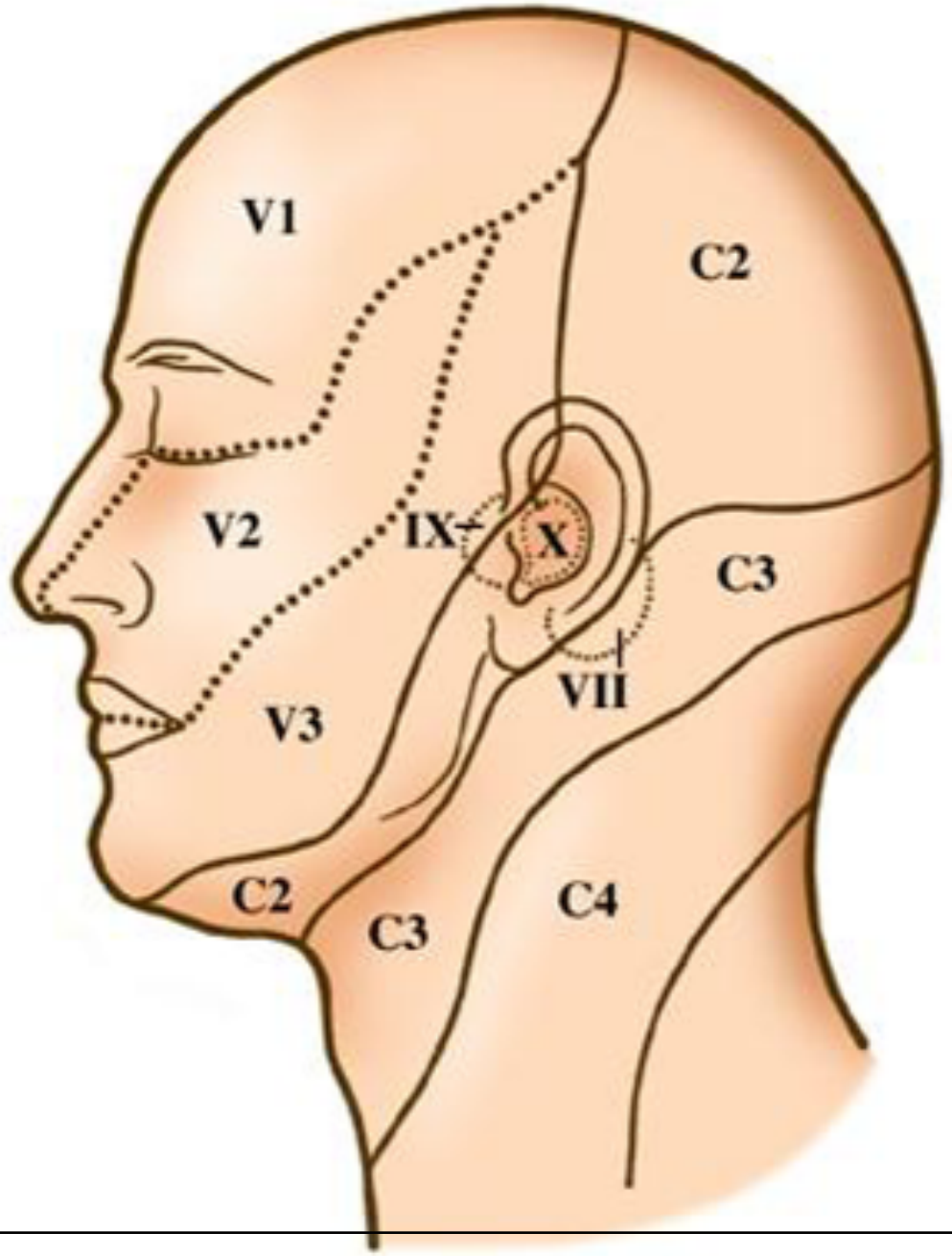
# Sudden Hearing Loss Causes (2)

- Ototoxic agents
  - Loop diuretics (furosemide, bumetanide, torsemide)
  - Salicylates (toxicity is classically associated with decreased hearing and tinnitus)
  - NSAIDS
  - Quinine
  - Antibiotics
    - Aminoglycoside (gentamicin, neomycin), erythromycin, vancomycin (is not an aminoglycoside)
  - Chemotherapeutic agents
  - Topical agents – neomycin, propylene glycol
- Conduction cause of decreased hearing:
  - Canal obstruction -- cerumen impaction (most frequent) / foreign bodies
  - TM abnormalities, middle ear effusion (otitis media and serous), ossicle dislocations

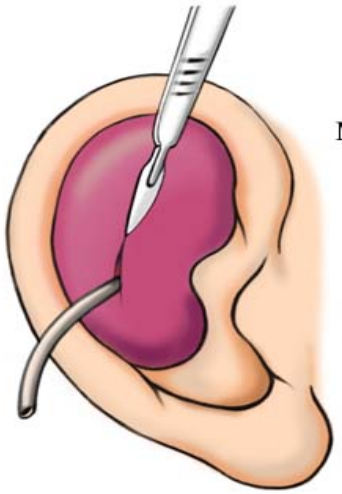
# Referred Ear Pain

- Ear sensation has multiple sources: cranial nerves V, VII, IX, X plus cervical roots C2,C3
- Dental
  - TMJ problems, tooth abscess, malocclusion
- Oropharyngeal tumors and infection
  - Tonsillitis, OM, mastoiditis, tumors
- Other
  - Cervical arthritis, sinusitis
  - Neuralgias (tic douloureux, Ramsay Hunt)

# Dermatomes of the Head



# Auricular Hematomas



**Treatment of Auricular Hematoma**

**Method 2: Incision and Drainage**

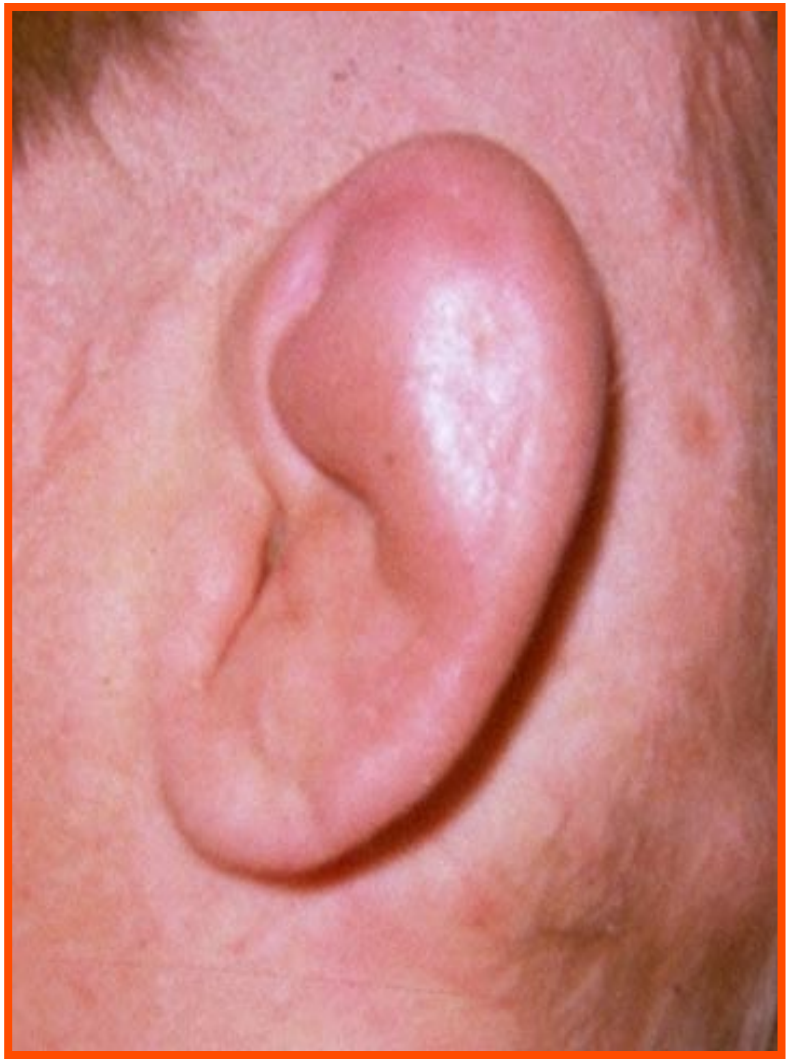
The skin is sterilely prepped (with iodophor and alcohol), and an ample scalpel incision is made over the mid-part of the hematoma. The incision must penetrate the perichondrium. The hematoma is evacuated and a sterile drain is placed.

**Treatment of Auricular Hematoma**

**Compression Dressing of the Ear**

1. Vaseline gauze or oil-soaked cotton is packed in and around the ear to conform to its natural shape and position.

2. Additional dry gauze is piled on for compression, and the packing is wrapped against the ear with a roll of elastic gauze.



# Cauliflower Ear

# Perichondritis

- Involves perichondrium – the tissue between the skin and cartilage
- Usually post-traumatic
- Often associated with ear piercing thru the cartilage (along the top of the ear)
- Can have pain, fever, swelling,warmth
- No involvement of pinna since no cartilage there
- **Pseudomonas**, Proteus, Staph

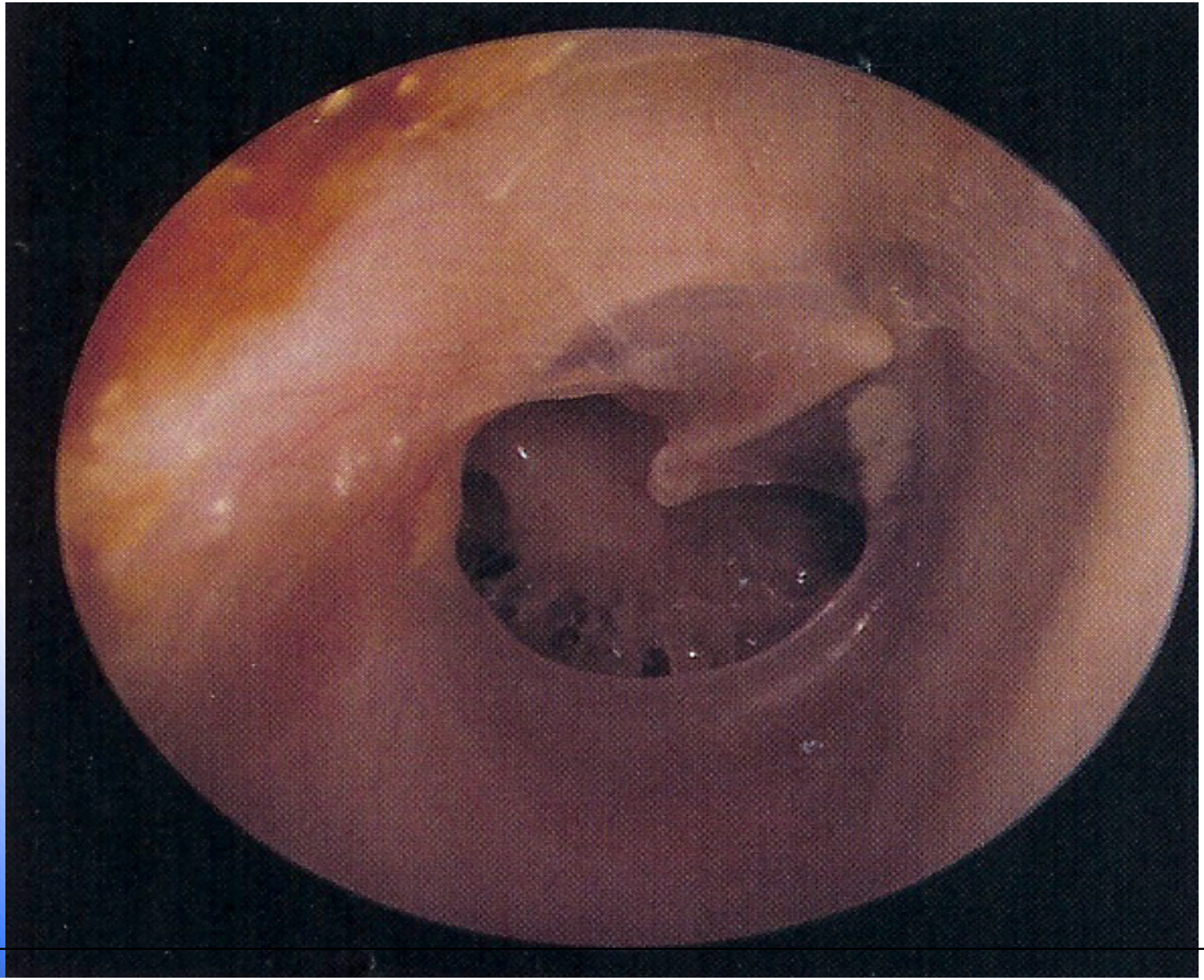
# TM Perforation (1)

- Cause: Otic barotrauma
  - Unequal pressures on either side of TM
  - Blocked eustachian tubes
    - ↑ altitude (gas expands): ↑ internal TM pressure
    - ↓ altitude (diving): ↑ external TM pressure
- Other causes
  - Trauma: blunt (slap) or penetrating (Q-tip)
  - Noise (blast), lightening
  - Infections (otitis, myringitis)
- Decreased hearing (conductive), pain, hemorrhage

# TM Perforation (2)

- Most heal spontaneously / most are anterior or inferior (pars tensa) – only a few cells thick
- Early referral (within 24 hours) for penetrating trauma or posterior perforation (risk of ossicle damage if posterior)
- Late referral OK for blunt trauma or noise
- No water in ear
- Topical or systemic antibiotics not generally required unless perforation is due to:
  - Infection / forceful water entry (e.g. water skiing)

# Chronic TM Perforation



# Otitis Externa

- Dermatitis → cellulitis → chondritis → osteomyelitis

Malignant external otitis = necrotizing external otitis: Primarily in elderly diabetics, Pseudomonas IV antibiotics

- Causes: **Pseudomonas**, Staph, Strep, fungal
- Culture only in advanced cases
- Pain on ear movement, canal cellulitis, drainage
- Topical antibiotics with steroids
- Fluoroquinolones (ofloxacin)

# Otitis Media

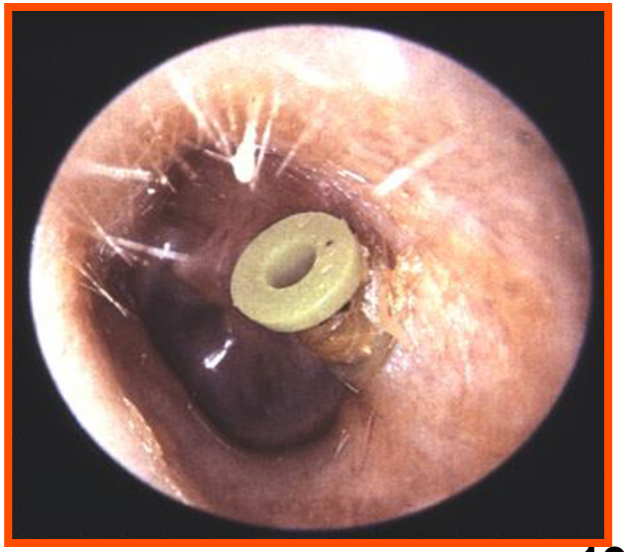
- Causes
  - **Bacterial causes = Strep. Pneumo [most common], H. influenzae, Moraxella catarrhalis**
  - Virus are the most common cause by far
- TM Physical Signs
  - Bulging TM / TM red, grey, yellow
  - Loss of light reflex
  - Decreased movement on insufflation (most sensitive)
- Complications
  - Mastoiditis
  - Labyrinthitis
  - Cranial nerve deficits (facial palsy)
  - Intracranial infections

# Bullous Myringitis

- Painful ear / often associated with a URI
- Rupture the bullous to relieve pain
- Give antibiotic drops to decrease the risk of secondary infection
- Often associated with otitis media (caused by the same organisms that usually cause otitis media) -- **mycoplasma infections are uncommon**)

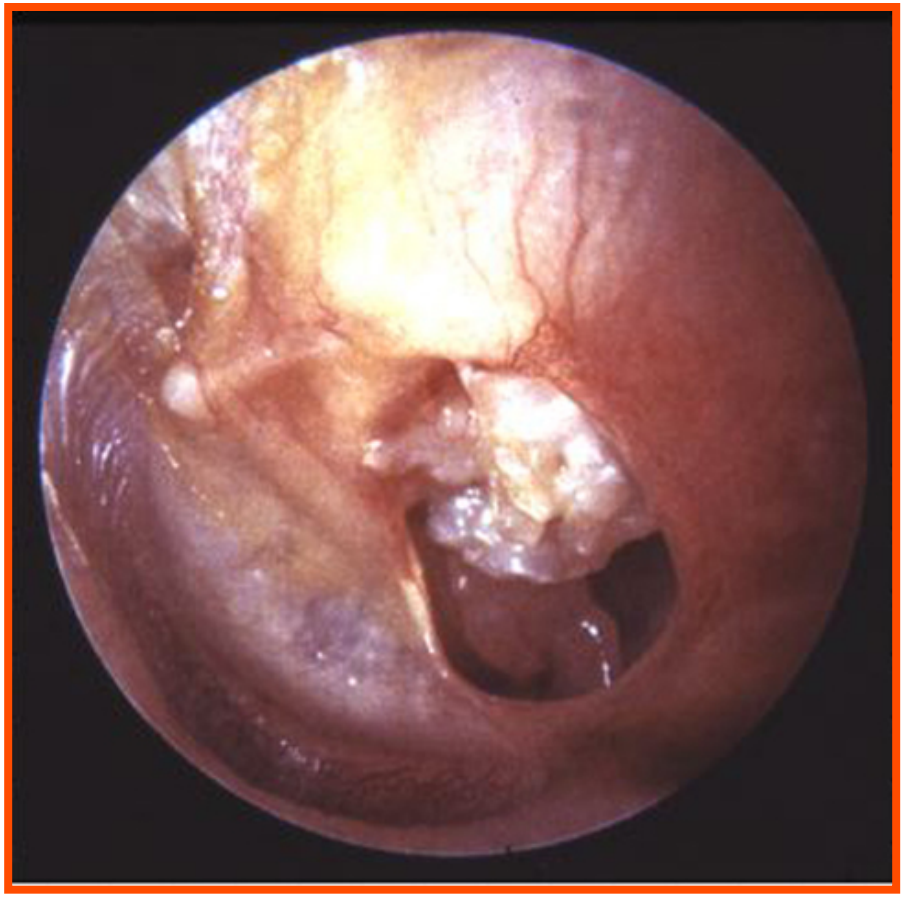
# Serous Otitis Media

- Also called “otitis media with effusion”
- Painless sequelae of acute OM
- Fluid behind TM (bubbles / levels)
- Decreased hearing
- Potential affects learning, speech
- Ear tubes when persistent



# Cholesteatoma

- Chronic TM perforation noted
- Keratin-producing squamous epithelium overgrowth in the middle ear
- Often foul-smelling drainage
- Can secrete bone-absorbing substances than can destroy inner ear structures
- Requires surgery



# Characteristics of Vertigo

| | Peripheral | Central |
|---|---|---|
| Onset | Sudden | Slow |
| Severity | Intense spinning | Less intense, ill-defined |
| Pattern | Intermittent | Constant |
| Worse on movement | Yes | No |
| Nausea / sweating | Frequent | Infrequent |
| Nystagmus | Horizontal, Rotatory-vertical | Vertical |
| Fatigues | Yes | No |
| Hearing loss / tinnitus | May occur | No |
| Abnormal TM | May occur | No |
| CNS Symptoms | Absent | Usually present |

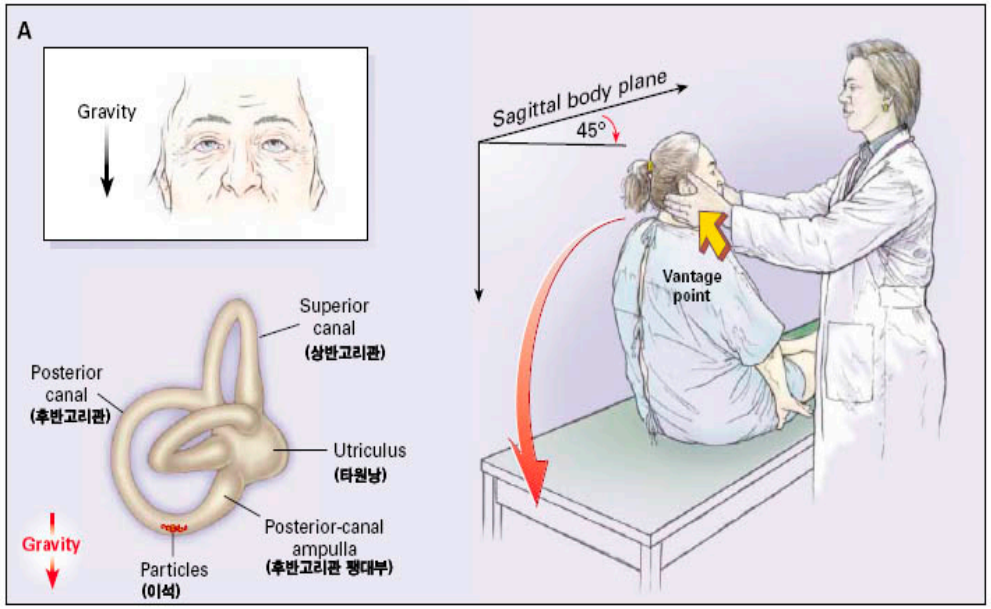
# Peripheral Vertigo Causes (1)
## (Ear / 8th Nerve Problems)

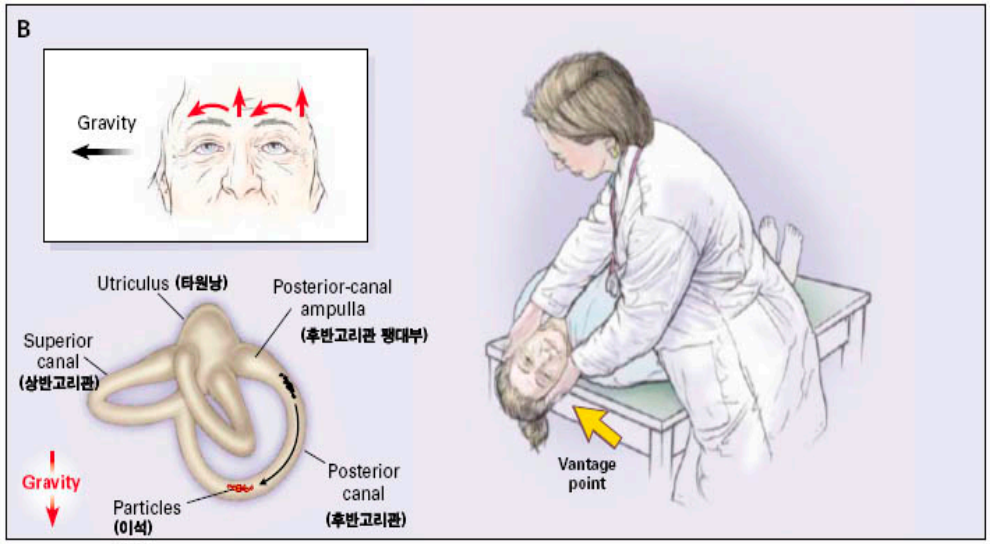
- Benign paroxysmal positional vertigo (BPPV)
  - Most common cause of recurrent peripheral vertigo
  - Precipitated by head turning / mid 50s / females 2:1 male
  - Cause – "canalolithiasis" – delayed unilateral activation of the posterior semicircular canal because of impaired endolymph flow caused by clumped otoliths (= otoconia).
  - **Lag of endolymph** = latency of nystagmus and symptoms onset of 1-5 seconds on provocative head turning
  - Crescendo / decrescendo nystagmus
  - **Duration of vertigo and nystagmus = 5-40 seconds - but recurs**
  - Vertigo / nystagmus fatigue with repeated head movement
  - Dix-Hallpike diagnostic positioning maneuver
  - No associated hearing problems or tinnitus
  - Treatment – particle repositioning maneuvers / sedatives

# Dix-Hallpike Test

1. 50-80% sensitive for PBBV
2. Sitting position
3. Supine with head turned 45 degrees to one side and extended 20 degrees backwards
4. If no nystagmus is noted, patient sits up and, after a 30 second rest, the maneuver is repeated to the other side

A positive test consists of burst of rotatory nystagmus with the fast movement towards the causative ear (nystagmus on right head turning while reclining with head extension is caused by the right ear.

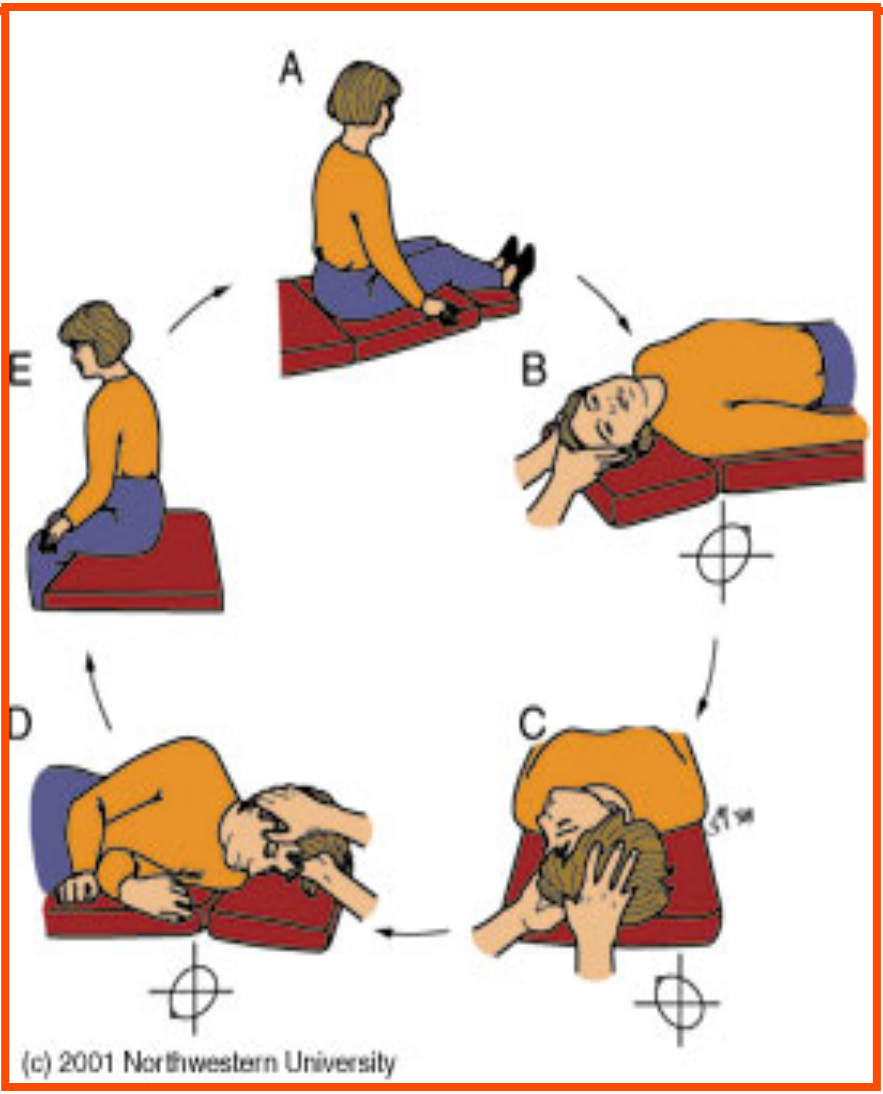


# Epley (Particle Repositioning) Maneuver – Treatment of BPPB

Involves sequential movement of the head into positions staying in each position for about 30 seconds / goal – move otolitis into utricle to improve flow of endolymph (85% post. canal)

- #1 -- Head is turned to the symptomatic side (B) for 30 to 60 seconds based on duration of the vertigo as measured by observation of nystagmus
- #2 -- Head is then turned in the opposite direction for 30-60 seconds
- #3 – Patient is rolled in the same direction so that the head remains turned and ultimately is nose down (30 seconds)
- # 4 -- Return to a sitting position
- Bursts of vertigo are common .



# Peripheral Vertigo Causes (2)

## (Ear / 8th Nerve Problems)

- Vestibular neuronitis (vestibular neuritis)
  - Acute onset, viral etiology?? (concurrent / recent URI)
  - **Lasts days to weeks / nausea, vomiting**
  - Worse with change in position / positional nystagmus (disturbed vision looking to one side indicates the opposite ear is the cause)
  - **Symptoms limited to the vestibular system** (balance) / no decreased hearing
- Labyrinthitis
  - Usually an infection of the labyrinth (concurrent / recent URI)
  - Can be the result of ototoxic drugs
  - Usually viral, rarely bacterial / look for OM / mastoiditis as cause
  - **Patients have vestibular and usually hearing symptoms**

# Peripheral Vertigo Causes (3)
## (Ear / 8th Nerve Problems)

- Meniere's Disease
  - Unilateral (usually) or bilateral excess production of endolymph
  - Paroxysmal tinnitus, vertigo, progressive hearing loss, sense of fullness or pressure in one or both ears
  - Spells last 2-8 hrs / weekly - monthly / low salt diet

# Peripheral Vertigo Causes (4)

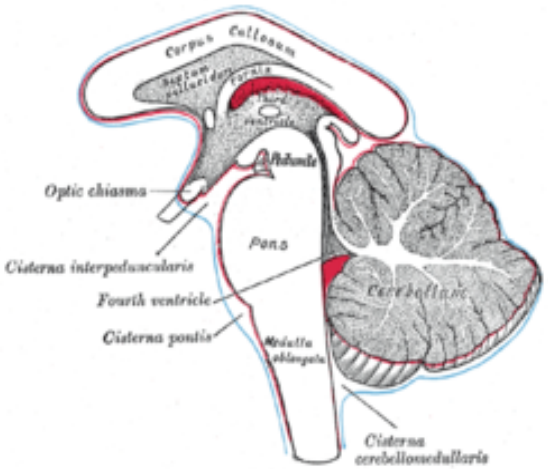
## (Ear / 8th Nerve Problems)

- Ototoxicity
  - Drugs accumulate in the endolymph and cause damage to the cochlear and vestibular hair cells
  - Drugs known to be ototoxic
    - Aminoglycosides – dose dependent / irreversible
    - Erythromycin – not dose dependent / reversible
    - Minocycline – not dose dependent / reversible
    - Quinolones – not dose dependent / reversible
    - NSAIDS (ASA) – dose dependent / reversible
    - Loop diuretics – not dose dependent / may be irreversible
    - Cytostatic drugs – dose dependent / not reversible
    - Antimalarials – not dose dependent / reversible
  - Vertigo is uncommon with these agents because the damage is bilateral and vertigo requires an imbalance of sensory input between the vestibular mechanisms
  - The three sources of input regarding position in space are vision, vestibular and joint proprioception – all must by in sync

# Peripheral Vertigo Causes (4)

## (Ear / 8th Nerve Problems)

- Eighth nerve lesions
  - Tumor involving the 8th nerve directly
    - Meningiomas, acoustic neuromas (schwannomas)
    - Gradual onset of mild vertigo and unsteadiness
  - Tumors of the cerebellopontine angle
    - Neuromas / meningiomas / dermoids
    - Deafness, ataxia, facial weakness
    - Loss of corneal reflex, cerebellar signs




  - Herpes zoster oticus
    - Also called Ramsay Hunt syndrome
    - Deafness, vertigo, facial palsy
    - Grouped vesicles on an erythematous base inside the ear canal

# Central Vertigo Causes

## (Cerebellum and Brainstem Problems)

- Cerebellar or brain stem hemorrhage and infarction
- Vertebrobasilar insufficiency
- Multiple sclerosis
  - Due to demyelination (brain and spinal cord) due to autoimmune-induced inflammation
  - Onset age 20-40, female predominance
  - Episodes may last hours to weeks
  - Look for other signs of MS – ataxia, optic neuritis (eye pain with decreased vision)
- Migraine-related dizziness and vertigo
  - Basilar type (brainstem) migraine (rare) auras:
    - Vertigo / decreased hearing / visual disturb.
    - Dysarthria (motor speech difficulty) / diplopia / decreased LOC

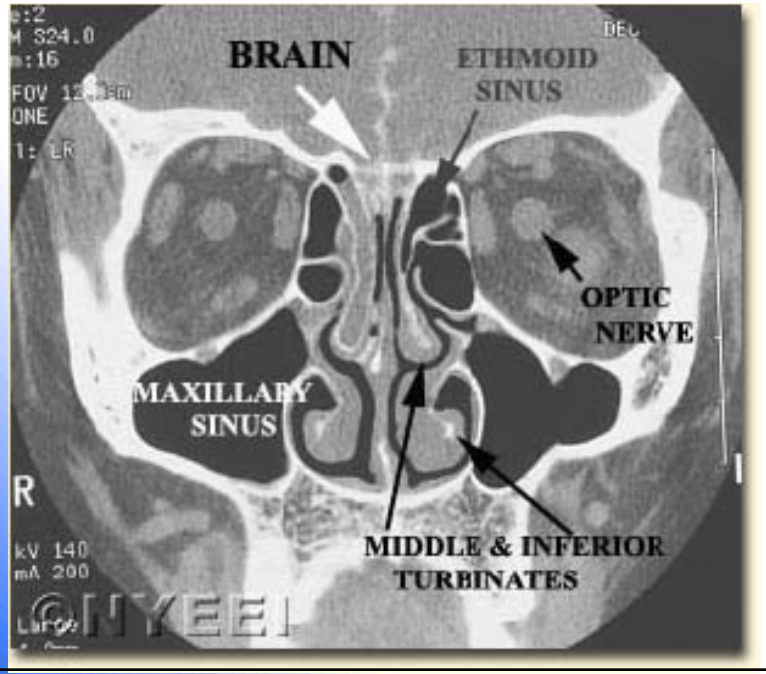
Vertical nystagmus suggests central origin

# Sinusitis

# Sinusitis

- X-rays not required for diagnosis
- Purulent nasal discharge
- Pain in upper molars, sinuses
- Complications
  - Brain abscess, meningitis
  - Cavernous sinus thrombosis
  - Skull osteomyelitis
  - Orbital cellulitis
- **Same causes as otitis media** (Strep. pneumo [most common bacterial cause] , H. flu., M. cat., anaerobes / viruses = causes most cases

# Maxillary Sinusitis

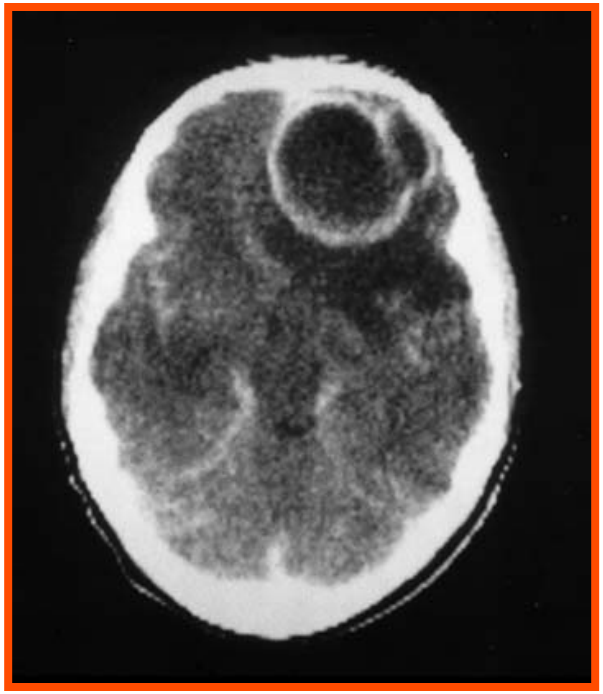




# Sinusitis Complications

Orbital Cellulitis

Osteomyelitis with
Prefrontal Facial Edema

Brain Abscess
Frontal Sinusitis



# Nosebleeds

Anterior (Kiesselbach's plexus)

- If severe or recurrent, consider coagulopathy or systemic disease

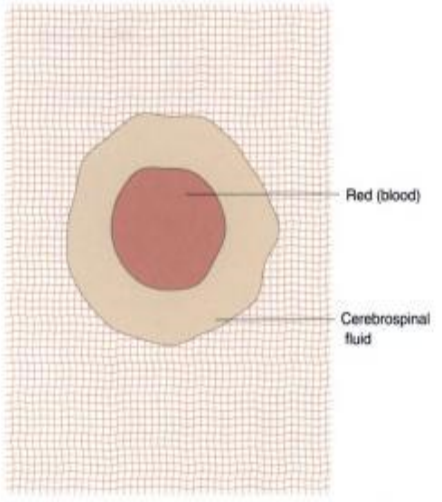
Posterior epistaxis (less common)

- Associated with atherosclerosis
- Elderly, hypertensive patients
- **Complications of posterior packing**
  - Infection (toxic shock), septal necrosis
  - Cardiac ischemia, arrhythmias, syncope
  - Dislodgement of packing into the airway
  - Sinusitis, otitis media
- Risk factors for **severe hypoxia** and CO2 retention
  - COPD, CHF, altered mental status

# Nasal Fracture

- Most common facial fracture / value of plain x-ray?
- Septal hematoma: I&D, pack
- **Abscess formation and septal perforation are complications of septal hematomas**
  - If untreated (requires intranasal drainage) causes saddle nose deformity
- Fracture of cribriform plate (ethmoid bone) causes CSF rhinorrhea. Diagnosed by CT
- CSF rhinorrhea (antibiotics controversial)
  - Increased by jugular compression, leaning forward
  - Ring sign (filter paper / bed sheet)
    - 2 rings = CSF
  - Dipstick: CSF glucose > 30 mg/dL

~~(Both tests of inconsistent reliability)~~

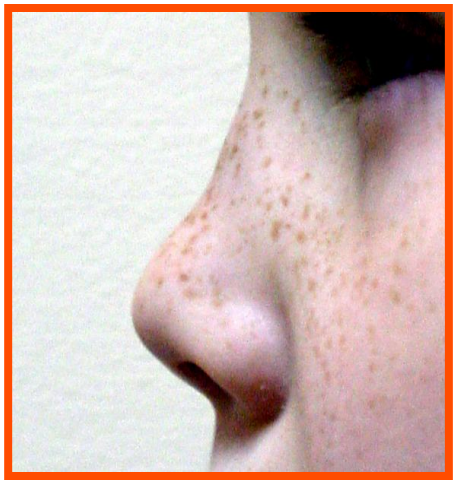


Halo sign. Clear drainage that separates from bloody drainage suggests the presence of cerebrospinal fluid.

# Nasal Fracture / Septal Hematoma





# Saddle Nose Deformity



Saddle nose deformity most commonly results from septal trauma

Bonus!!! – cauliflower ear – both entities result from the destruction of cartilage by blood-induced lysis

# Midfacial Fracture

- LeFort classification
  - I - Horizontal maxillary fracture
    - Free-floating upper alveolar process
  - II - Pyramid fracture
    - Free-floating mid-face (maxilla, nose, cheeks)
  - III - Upper jaw, nose and lateral orbits (zygoma)
- Concerns
  - Especially II, III
    - C-spine injury
    - Airway compromise (retropharyngeal hematoma)
    - CSF rhinorrhea
    - Bleeding
    - Malocclusion if diagnosis missed

## Le Fort I

The nose is not mobile.

The upper dental arch is mobile.

## Le Fort II

The zygoma is not mobile.

The upper dental arch and the nose are mobile.

## Le Fort III

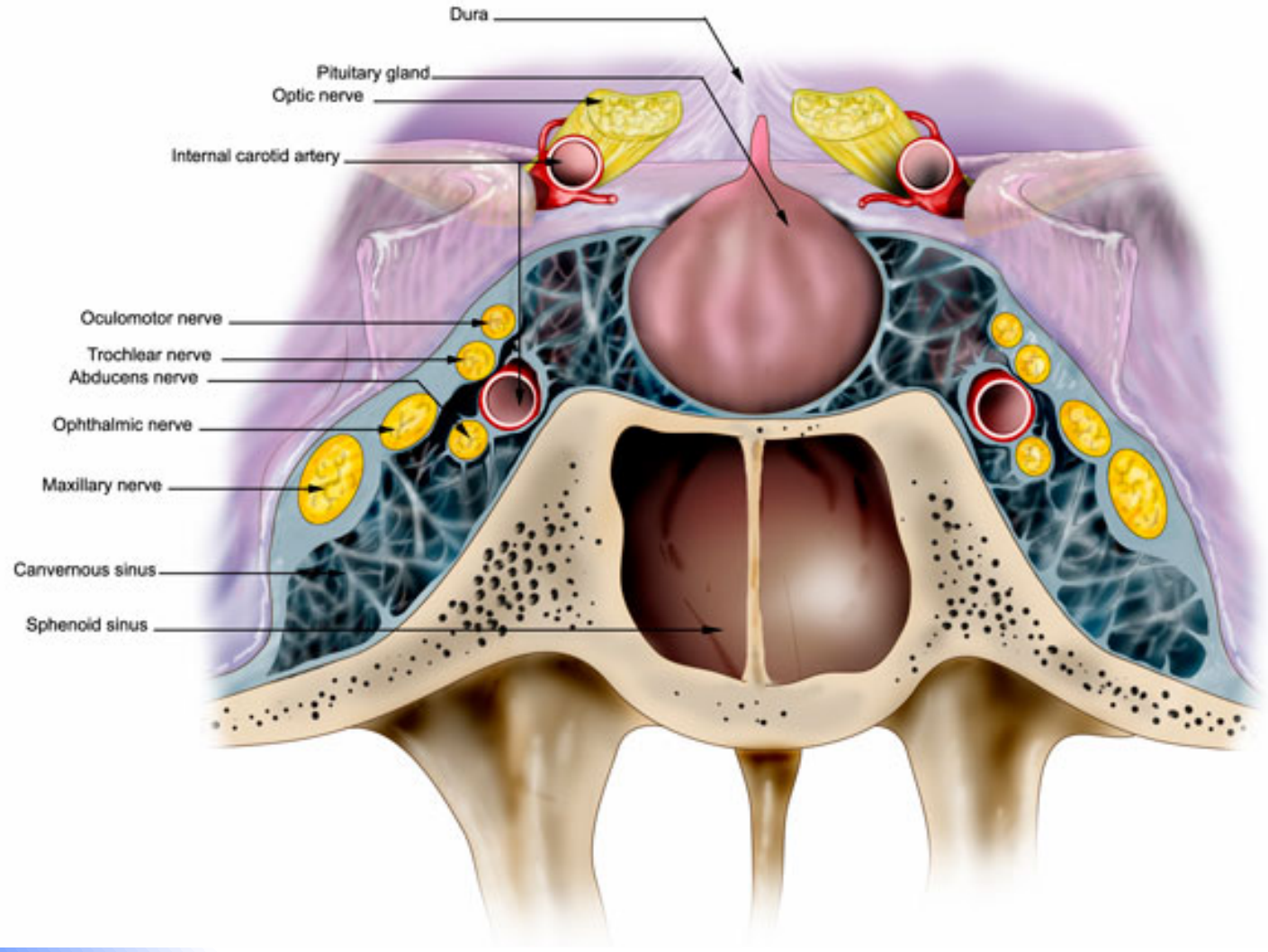
The entire face is mobile. (upper dental arch, nose and zygomas)

# Cavernous Sinus Thrombosis

- Complication of central facial infection
- Veins of face, oral cavity, middle ear, mastoid drain to cavernous sinus
  - Dental extraction, sinusitis, periorbital cellulitis
  - High fever, toxic appearance (late findings)
  - Eyelid edema, proptosis, conjunctival edema (chemosis), facial edema
  - Cranial nerve palsies (III, IV, V, VI – VI is most common)
  - Pupillary dysfunction (mydriasis from III dysfunction
- MRI, CT

**~~Head /neck infection + venous obstruction + ophthalmoplegia~~**

# Cavernous Sinus Thrombosis

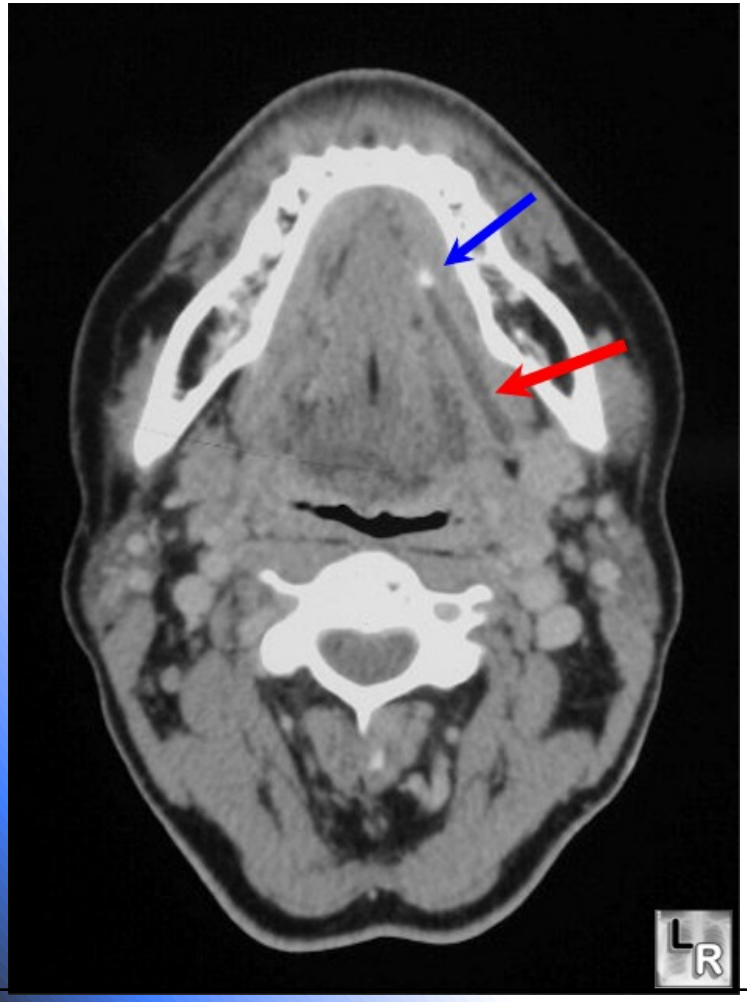


# Salivary Gland Problems

- Viral infections (sialoadenitis)
  - Parotid gland: mumps (usually bilateral, increased amylase)
- Bacterial infections
  - Debilitated patients, post-op, often unilateral,
  - Pus from parotid duct / erythema / pain / usually Staph
  - Dehydration / diabetes / dry mouth drugs predispose
- Calculi
  - Usually submandibular (80-95%) / males x2 incidence
  - Increased symptoms with meals
  - Often (80% submandibular / 60% parotid) seen on X-ray (calcification)
  - Secondary Staph infections

# Salivary Duct Stones

Submandibular Duct Stone with Dilated Duct Proximally

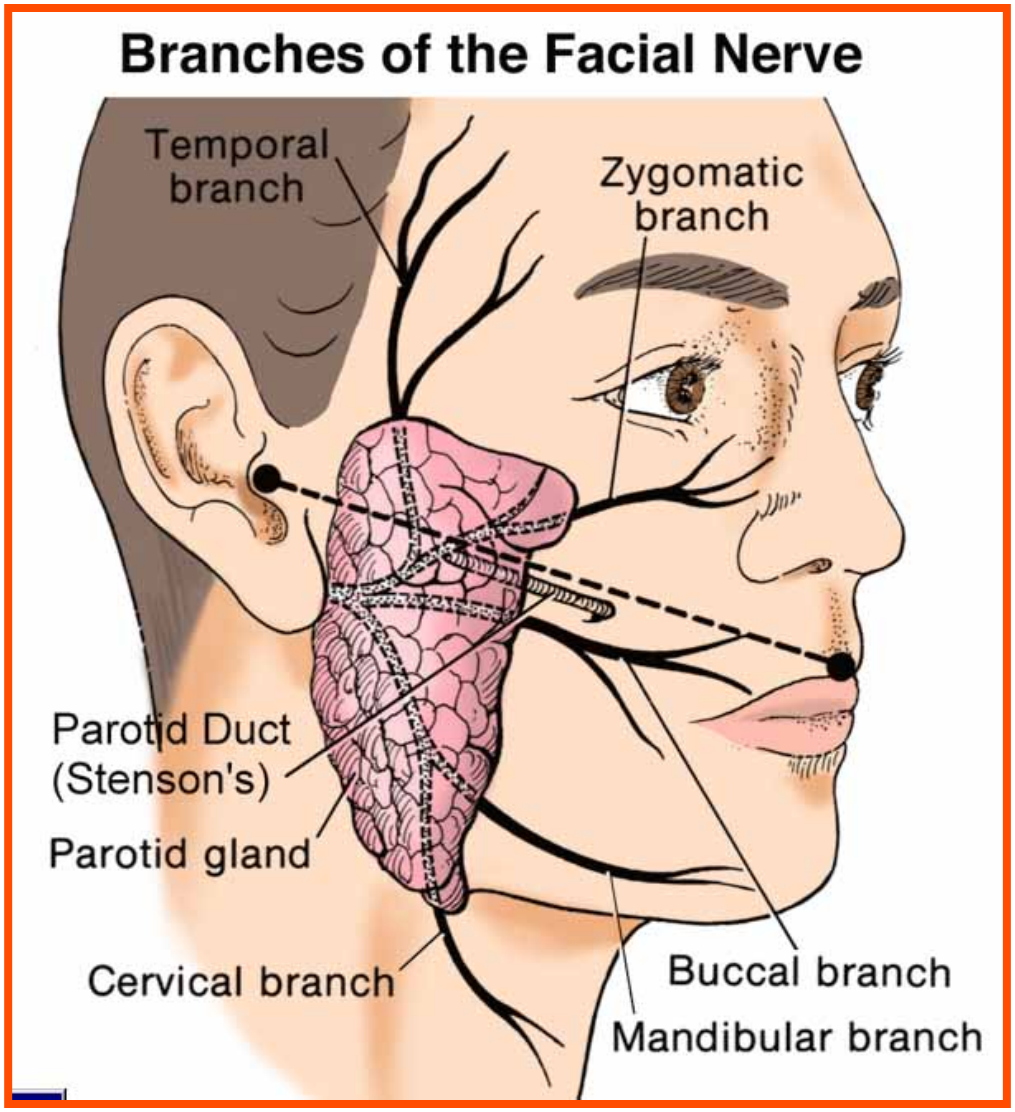



Submandibular Gland Stone Note on Plain X-ray

# Parotid Duct / Facial Nerve Proximity

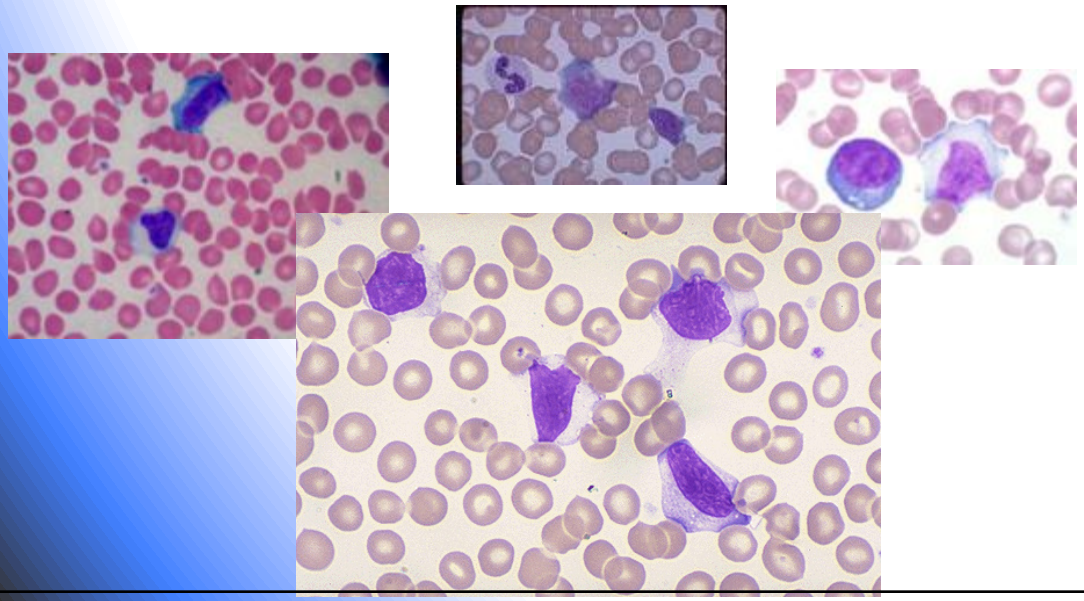
**Important Relationship**

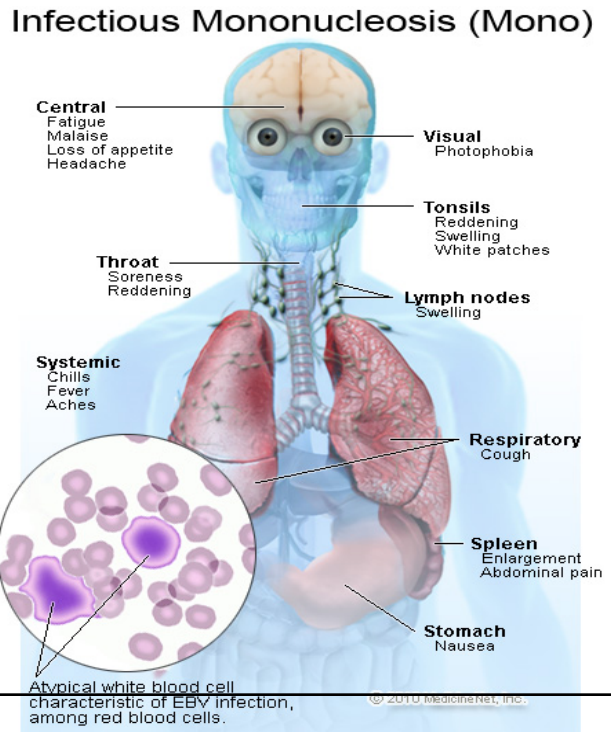
A vertically oriented laceration posterior to the corner of the eye and bisecting a line drawn from the tragus of the ear to the center of the upper lip can involve both the facial nerve and the parotid duct



# Infectious Mononucleosis

- Epstein Barr virus = Human herpes virus 4
- 90-95% of the population is serologically positive for prior exposure
- Transmission via saliva
- Fever, malaise, fatigue, sore throat, exudates, lymphadenopathy (**posterior cervical chain is considered pathognomonic**), splenomegaly, atypical lymphocytosis, elevated transaminase levels
- If given ampicillin, 95% get EBV-induced antibodies to it and a rash
- Care regarding potential splenic trauma





# Ludwig's Angina

- Bilateral cellulitis of the submandibular space
- Involves connective tissue, fascia and muscles
- Usually odontogenic in origin (as are most deep neck infections (posterior molars, abscess, trauma, recent extraction)
- Brawny, painful edema of submandibular area
- Can progress to restricted neck motion, trismus, dysphonia, posterior tongue dislocation
- Airway compromise may be precipitated by direct visualization
- Fever, leukocytosis
- Mixed aerobic and anaerobic infection

# Ludwig's Angina

Figure—Submandibular and sublingual erythema and swelling typical of Ludwig's angina.

# Acute Necrotizing Ulcerative Gingivitis

- Acute necrotizing ulcerative gingivitis (ANUG) / trench mouth – can look like herpes gingivostomatitis
- Cause = fusobacteria and spirochetes
- Vincent's angina (extension to pharynx and tonsils)
- Gums are red, swollen, painful, ulcerated with foul odor
- Young adults (troops WWI), poor oral hygiene, rule out HIV
- Fever, malaise
- Metronidazole, clindamycin
- Gingival hyperplasia: consider phenytoin, leukemia, cyclosporin, calcium channel blockers

**Trench Mouth / ANUG**

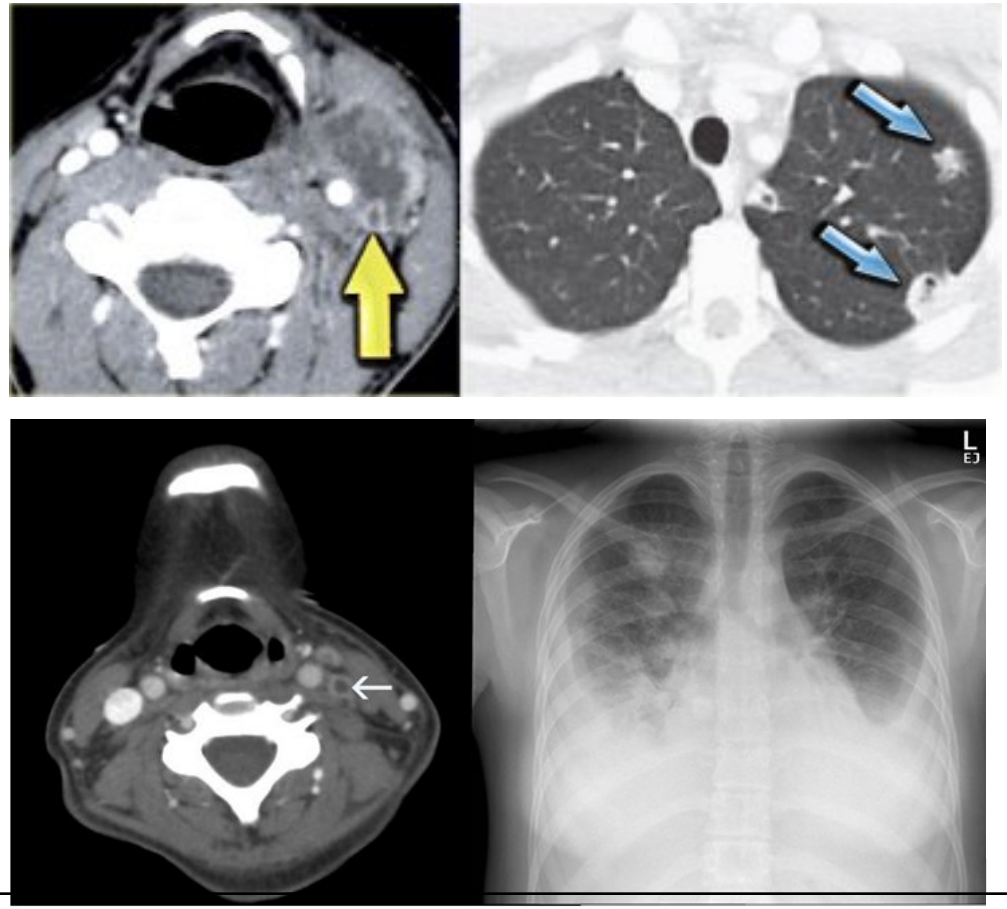
**Acute Leukemia**

**Phenytoin Gum Hyperplasia**

# Lemierre's Syndrome

- Begins as strep pharyngitis (may subside as infection in the neck progresses)
- Usual cause = Secondary Fusobacterium necrophorum
- Complicated by septic thrombophlebitis of the internal jugular vein (usually unilateral)
- Pain, edema and tenderness in the anterior cervical triangle
- Septic emboli to the lungs may lead to pulmonary abscesses and empyema

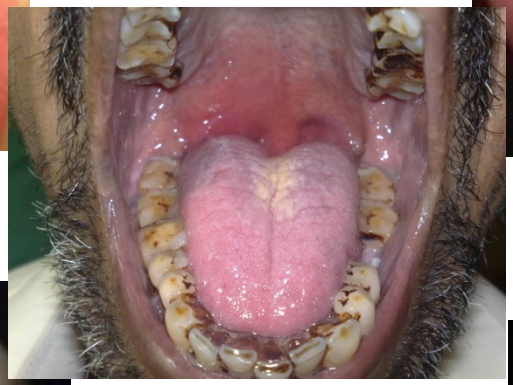
**Internal jugular thrombosis with sternocleidomastoid swelling and septic emboli to the lungs**



# Peritonsillar Abscess

- Most common deep facial infection in adults
- Rare in children under 12
- Fever, sore throat, trismus, peritonsillar mass displacing soft palate and uvula
- Complications
  - Airway obstruction, aspiration of abscess contents
  - Sepsis, retropharyngeal / parapharyngeal abscess
  - Mediastinitis
- Treatment: ENT I&D, needle aspiration (no deeper than 1cm), watch for internal carotid artery (consider ultrasound)

# Peritonsillar Abscess



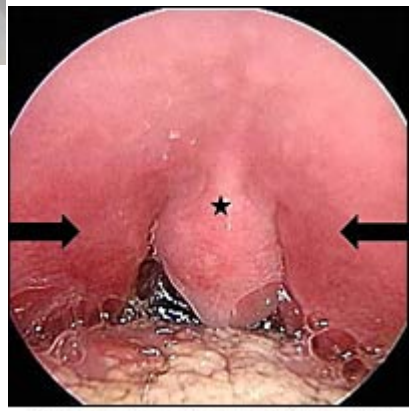
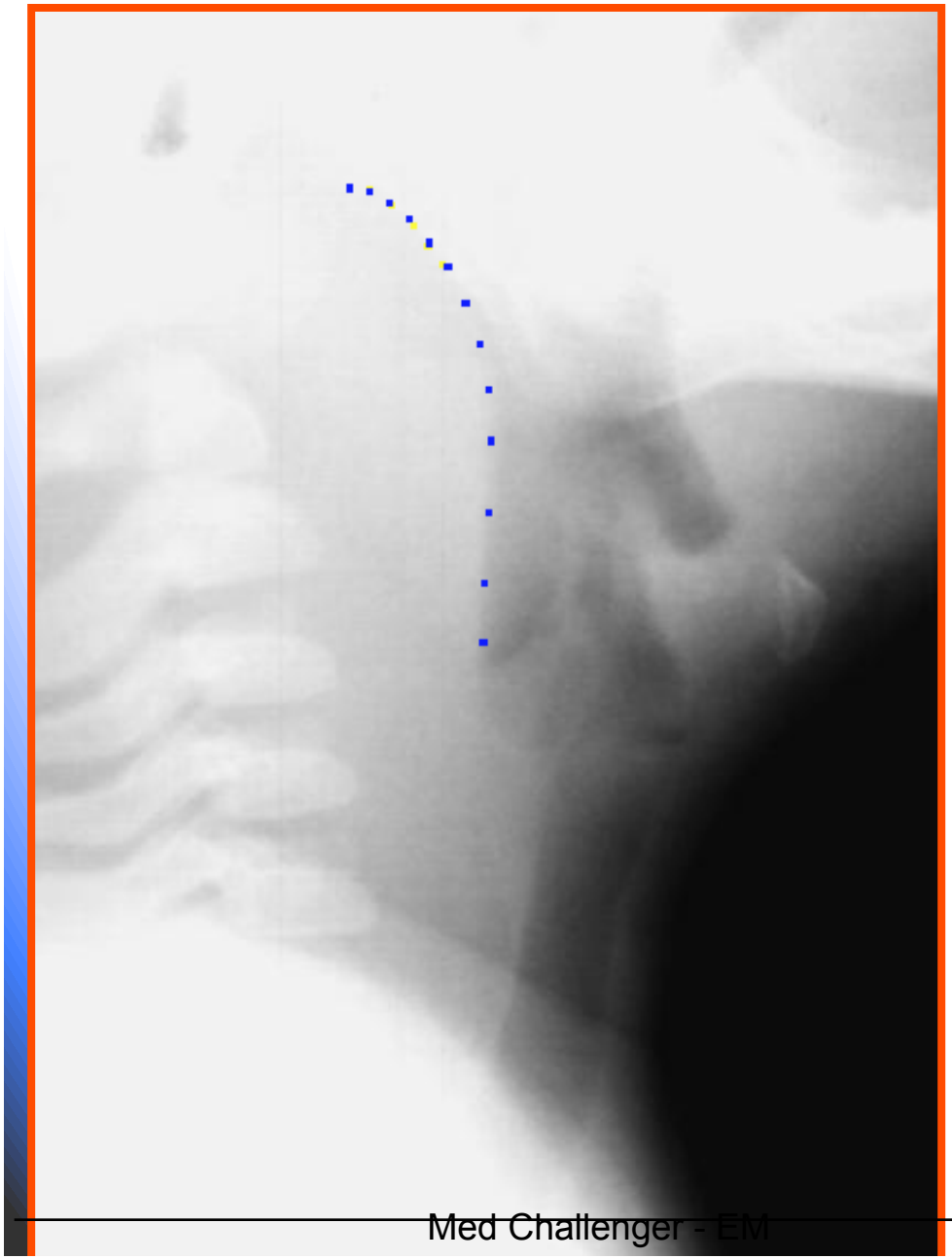


Photo credit: Supplied by author

# Retropharyngeal Abscess

- Infants and young children (but adult cases are seen – if so, look for mediastinal extension)
- Fever, neck pain, difficulty talking, swallowing and breathing, torticollis
- “Cri du canard” (duck-like voice)
- Intraoral exam shows anterior displacement of posterior pharyngeal wall
- X-ray may show posterior pharyngeal wall anterior soft tissue displacement (neck flexion may give a false-positive X-ray)
- Diagnosis: CT / Hx (e.g. fall with stick/pencil in mouth)
- ENT consult

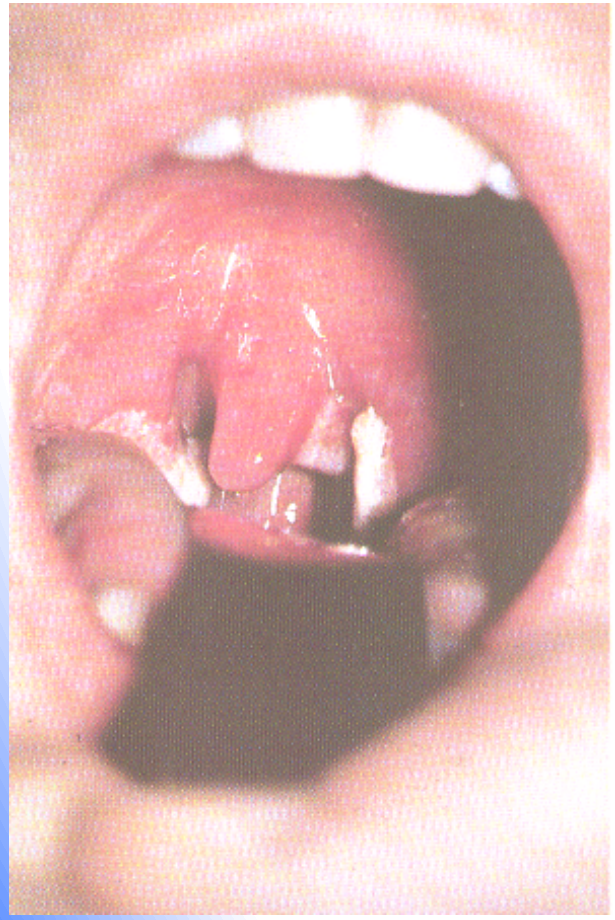
# Retropharyngeal Abscess



# Diphtheria

- Corynebacterium diphtheriae = club-shaped Gram + bacillus
- Respiratory droplet transmission or via skin lesions (cutaneous diphtheria -- less severe – urban outbreaks)
- Upper respiratory variant (**pharyngeal pseudomembrane forms as the result of exotoxin-induced necrosis**)
- The extent of the membrane parallels clinical severity and is associated with cervical adenopathy ("**bull neck**")
- Exotoxin causes disruption of protein synthesis
- Multiorgan system damage (primarily heart, CNS, kidneys, liver)
- Neuropathy is routine in severe illness as is myocarditis
- Death due to myocarditis / airway obstruction
- Treatment = equine serum diphtheria antitoxin plus antibiotics (erythyromycin / penicillin) / antibiotics to carriers

# Diphtheria Pseudomembrane



**Child with "bull neck" appearance of diphtheritic cervical lymphadenopathy**

# Bacterial Tracheitis

- Rare, life-threatening disease of childhood
- Most common in children under age 3
- **Can mimic croup, but more toxic, high fever**
- Bacterial superinfection of a preceding viral infection
- Respiratory distress, septic appearance
- Severe inspiratory and expiratory wheezes
- Purulent secretions
- Clinically similar to epiglottitis
- Staph, H. flu, Strep
- Airway obstruction

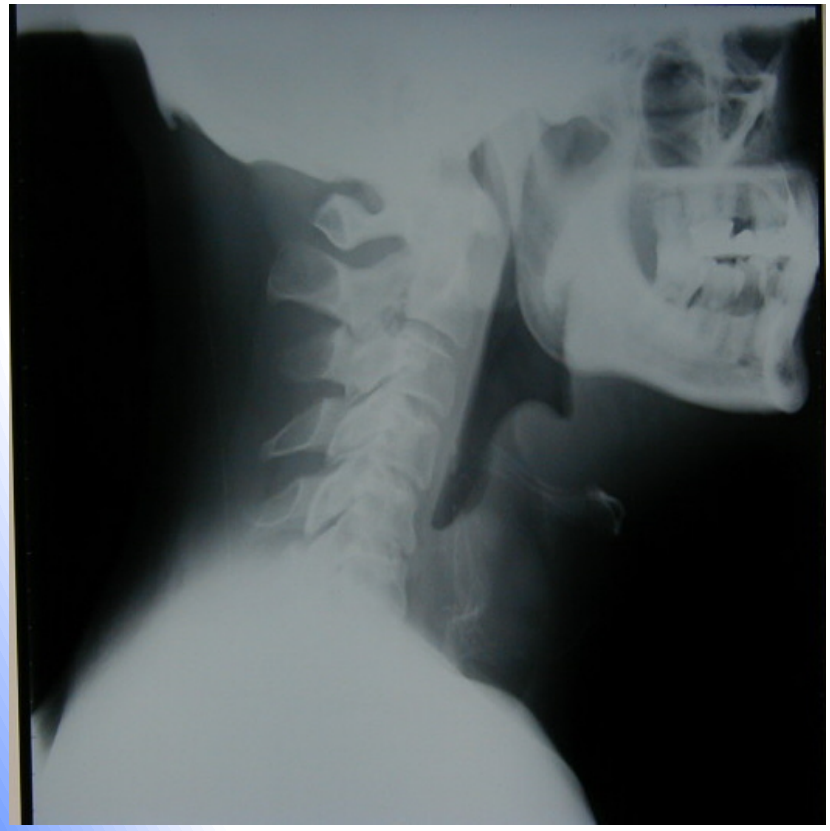
# Epiglottitis

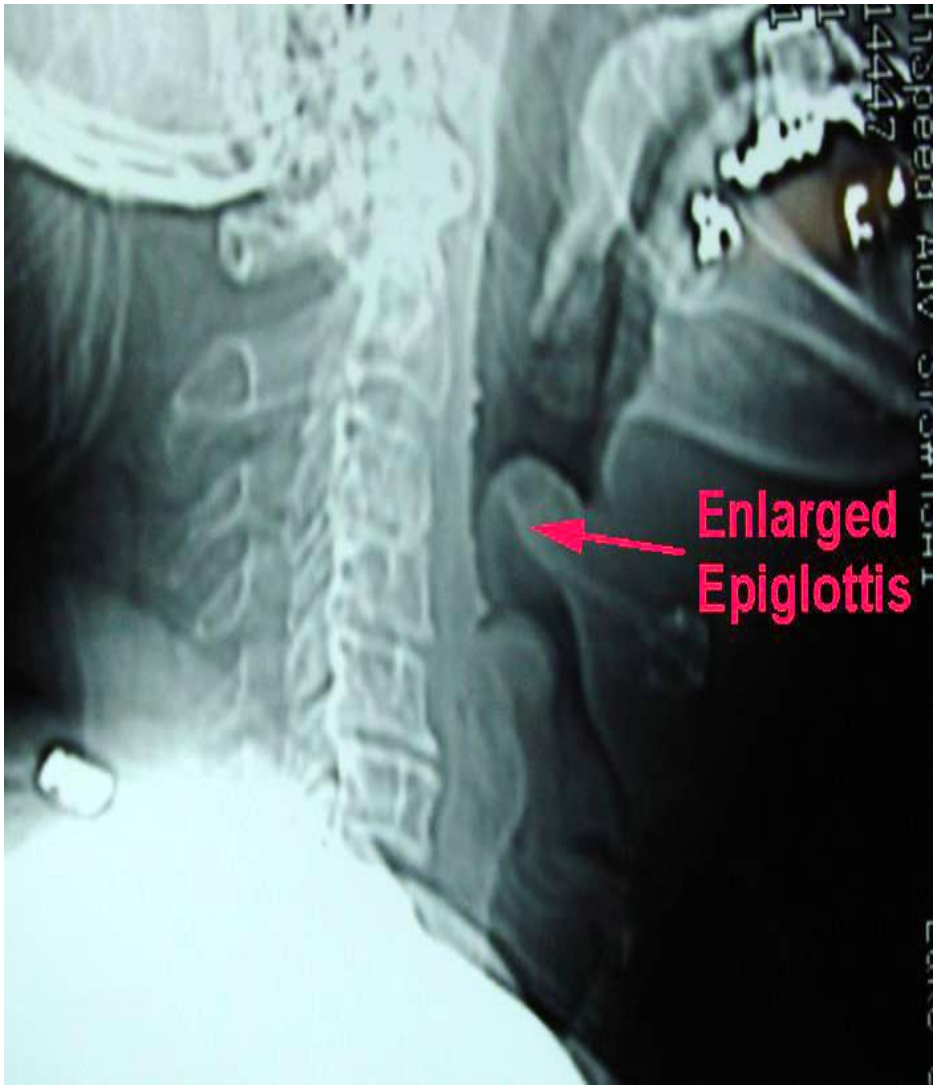
- Now more common in adults than children
- Airway obstruction, stridor (rapid onset)
- Severe sore throat with largely negative oropharynx exam
- Pain on moving thyroid cartilage

Notify ENT, anesthesia and operating room if airway compromise is a significant concern

- X-ray: “Thumb shaped” epiglottis
- Direct laryngoscopy OK (possible intubation or tracheostomy)
- Treatment: Consult, ceftriaxone, oxygen, heliox

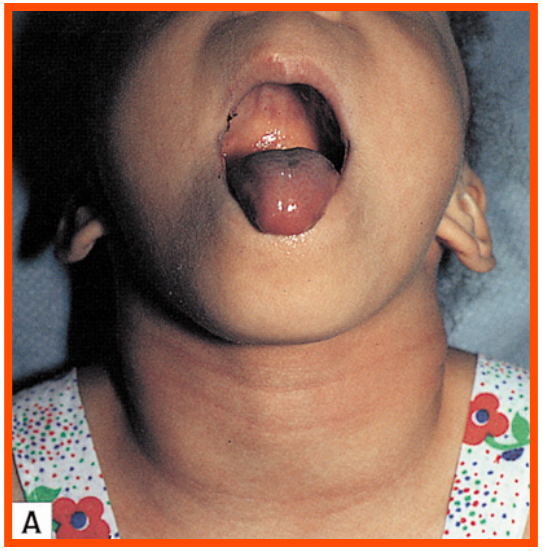
# Epiglottitis





# Cervical Adenopathy

- Primary infection
  - Staph and Strep
- Response to local infection
- Response to systemic disease
  - Mononucleosis
  - Sarcoid
  - Tuberculosis
  - Toxoplasmosis




# Croup

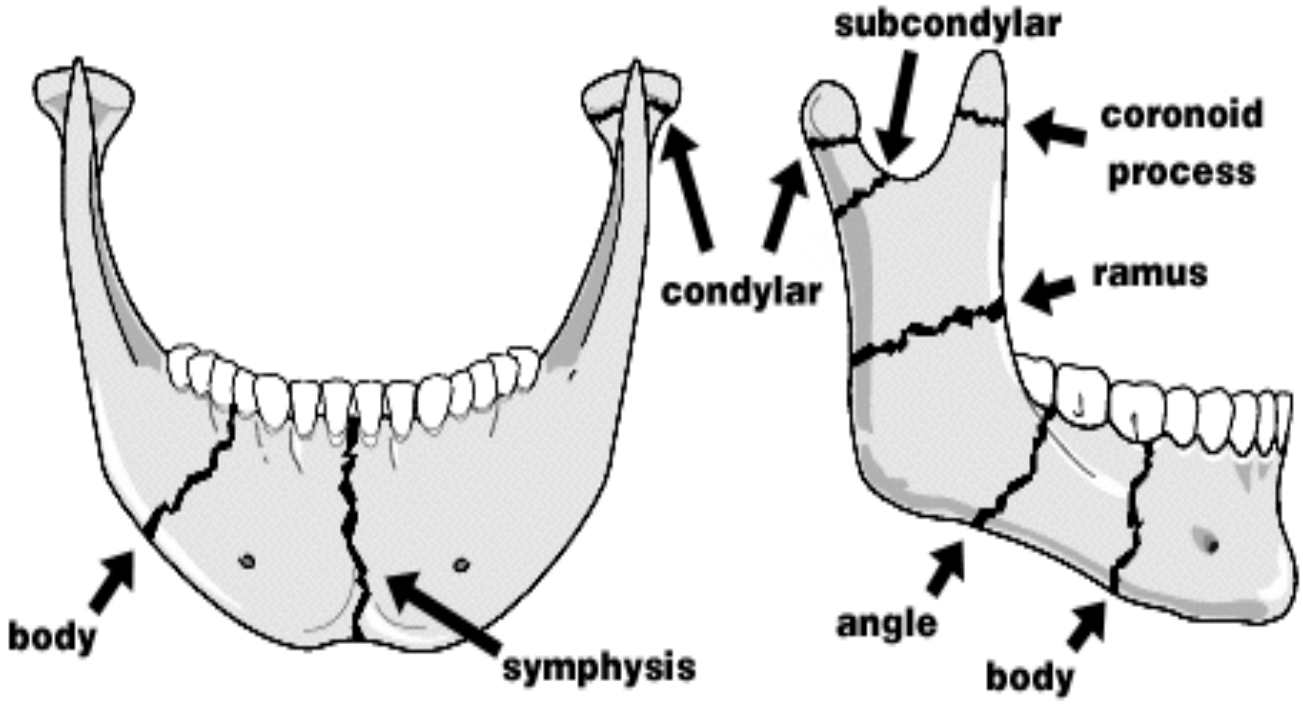
- Laryngotracheobronchitis
- Most common cause of upper respiratory obstruction in childhood
- 6 mo – 6 yr (2 yr peak)
- Parainfluenza virus (50%)
- Subglottic edema, respiratory distress, barking seal cough
- Treatment:
  - Epinephrine (either racemic or L epi),
  - Steroids, No antibiotics,
  - Beta-adrenergics not advised – may cause vasodilation due to vascular beta receptor activation and increase airway narrowing

# Mandible

- Causes of Trismus (DATE)
  - Dystonia
  - Abscess (peritonsillar, Ludwig's angina)
  - Tetany (tetanus, hypocalcemia)
  - Epiglottitis
- Mandible Fracture
  - Malocclusion, mental nerve anesthesia (chin / lip)
  - Blood in mouth suggests open fracture (admit, antibiotics)
  - Jaw may deviate to side of fracture
  - Often have multiple fractures (rings break in two places)
  - Children 4-11 at risk for facial growth disturbances if fracture missed – consider in all cases with a blow to the chin and any trismus or TMJ area tenderness

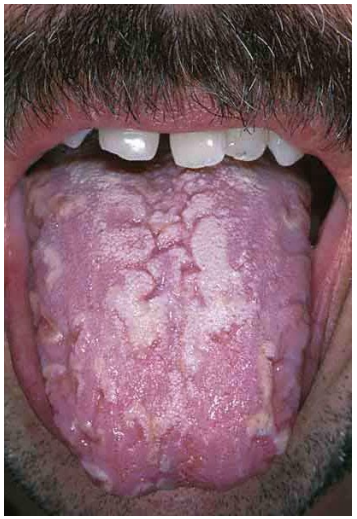
# Mandible Fracture

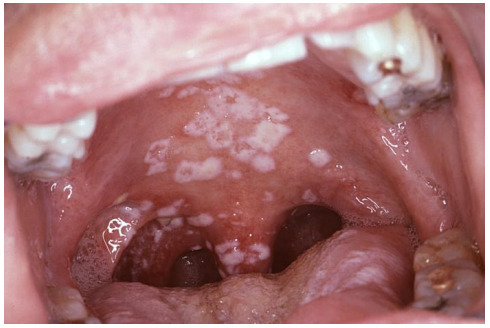
| Fracture Type | Prevalence |
|---|---|
| Body | 30 - 40 % |
| Angle | 25 - 31 % |
| Condyle | 15 - 17 % |
| Symphysis | 7 - 15 % |
| Ramus | 3 - 9 % |
| Alveolar | 2 - 4 % |
| Coronoid process | 1 - 2 % |



# Candidiasis / Moniliasis

- White, curd-like plaques of C. albicans on erythematous base
- Easily scraped off
- Risk factors:
  - Extremes of age
  - Antibiotics
  - Dentures
  - Diabetes
  - Steroids
  - HIV
  - Chemotherapy
- Treatment:
  - Clotrimazole
  - Fluconazole





# Leukoplakia

- White plaque on mucosal surfaces that cannot be scraped off (unlike candidiasis)
- Precancerous, males, smoking, trauma
- Refer for biopsy

# Aphthous Ulcers (Canker Sores)

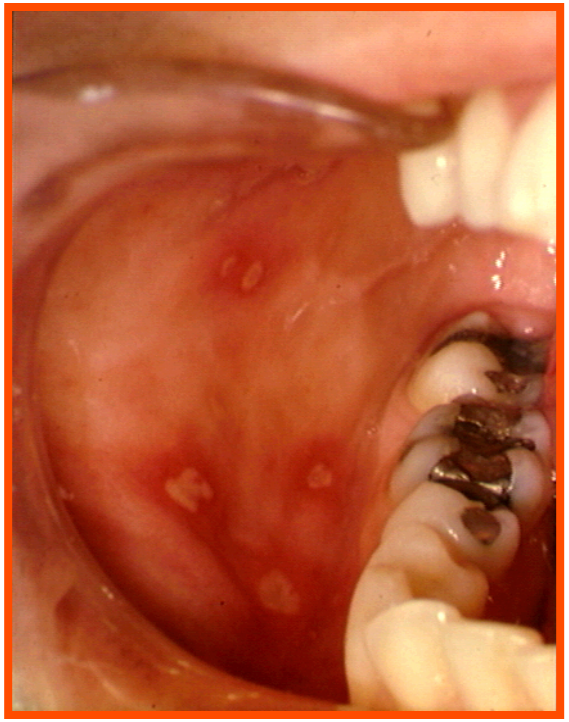
- "Aphtha" is Greek for "ulcer"
- Painful red macules with ulcerations / typically inner lips and cheek
- Believed to be a cell-mediated immune response to an unknown trigger
- Topical steroids (Kenalog) / benzocaine (Ambesol) / antihistamine mixed with antacid mouth rinse / antibiotic mouth rinse / amlexanox (Aphthasol) is probably most effective (an antiinflammatory, antiallergic immunomodulator

# Herpes Simplex Gingivostomatitis

- Also called “fever blisters” or “cold sores” / HSV 1 or 2
- Fever and adenopathy (may precede lesions by 3 days)
- Initially, vesicular lesions
- Painful ulcers on gingiva and mucosa
- Secondary infection of lip lesions is common
- Dormant virus activated by sun, stress, unknown factors
- Acyclovir-type drugs may lessen severity and duration

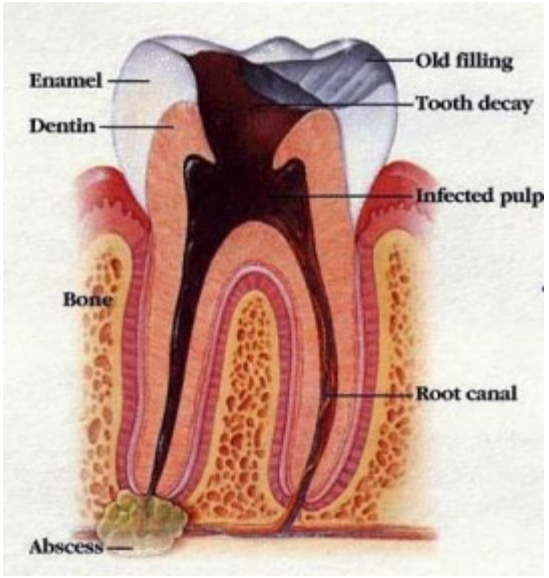
# Herpangina

- Coxsackie virus
- Sudden onset high fever, sore throat, headache
- Followed by multiple oral vesicles that rupture, then develop into painful ulcers
- Lesions on soft palate, uvula, posterior pharynx, **sparing the buccal mucosa, gingiva and tongue**
- Lasts 7-10 days

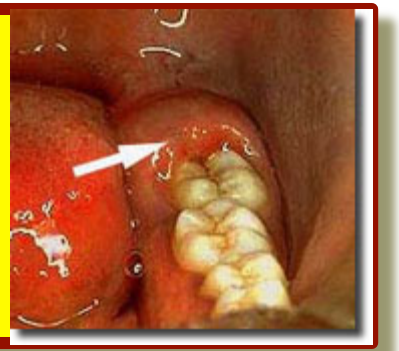


# Dental Caries / Pulpitis

- Reversible pulpitis with caries
  - Sharp intermittent tooth pain, subsides quickly
  - Worse with cold temperature
- Irreversible pulpitis with caries
  - Dull, continuous tooth pain, persists minutes to hours
  - Worse with hot temperature
  - Penicillin, referral and pain meds




Pericoronitis: Gum inflammation due to food impaction around crowded, malerupted or impacted third molars



# Dental Abscesses

- Periapical abscess
  - Most common cause of severe tooth pain
  - Inflammation, infection and necrosis of the apical portion of the tooth (the bottom of the tooth)
  - Abscess can erode through cortical bone and drain externally on gums = Parulis
- Periodontal abscess
  - Gum disease is the most common cause of tooth loss
  - Gum inflammation, calculus, infection, abscess
- Treatment
  - I & D, PCN + clindamycin or metronidazole

# Dental Abscesses

Periodontal Abscess

Periapical Abscess

Periapical Abscess

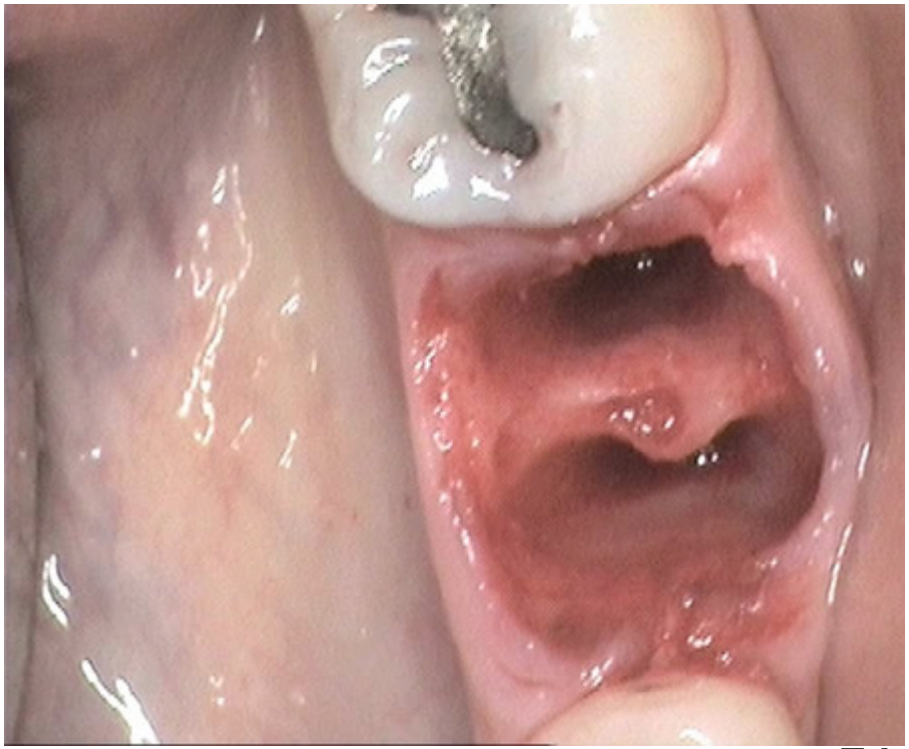
Arrows denote areas of abscess formation with decreased bone density and possible gas formation

# Common Dental Emergencies

| *Diagnosis* | *Definition* | *Presentation* | *Complications* | *Treatment* |
|---|---|---|---|---|
| Reversible pulpitis | Pulpal inflammation | Pain with hot, cold, or sweet stimuli | Periapical abscess, cellulits | Filling |
| Irreversible pulpitis | Pulpal inflammation | Spontaneous, poorly localized pain | Periapical abscess, cellulitis | Root canal<br>Extraction |
| Periodontal abscess | Gum abscess | Pain, local gum mass | Cellulitis | I/D, penicillin<br>+/- metronidazole<br>or clindamycin |
| Periapical abscess<br><br>Antibiotics | Infection / necrosis of the tooth apex | Toothache<br>Most commonly<br><br>due to a dead tooth | Rupture through alveolar bone<br><br>(= parulis) | Root canal &<br><br>Extraction |
| Pericoronitis | Inflamed gum over partially erupted molar due to food impaction | Pain, erythema local swelliing | Cellulitis | Irrigation<br>Antibiotics if cellulitis noted |
| Tooth fracture with bleeding or pulp exposed | Broken tooth into the viable area | Bleeding from center of tooth or reddish central blush noted | Pulpitis<br>Tooth death | Fillings with or without root canal |
| Tooth fracture with only enamel involved | No viable part of tooth involved | No bleeding or reddish blush | Cosmesis<br>Rough edges | Cosmesis |
| Tooth loose | Traumatic | Loose / bleeding | Pulpitis, aspiration | Splint, root canal? |
| Tooth avulsed | Traumatic | Absent tooth | Ankylosis, resorption | Reimplant / splint |

# Alveolar Osteitis (Dry Socket)

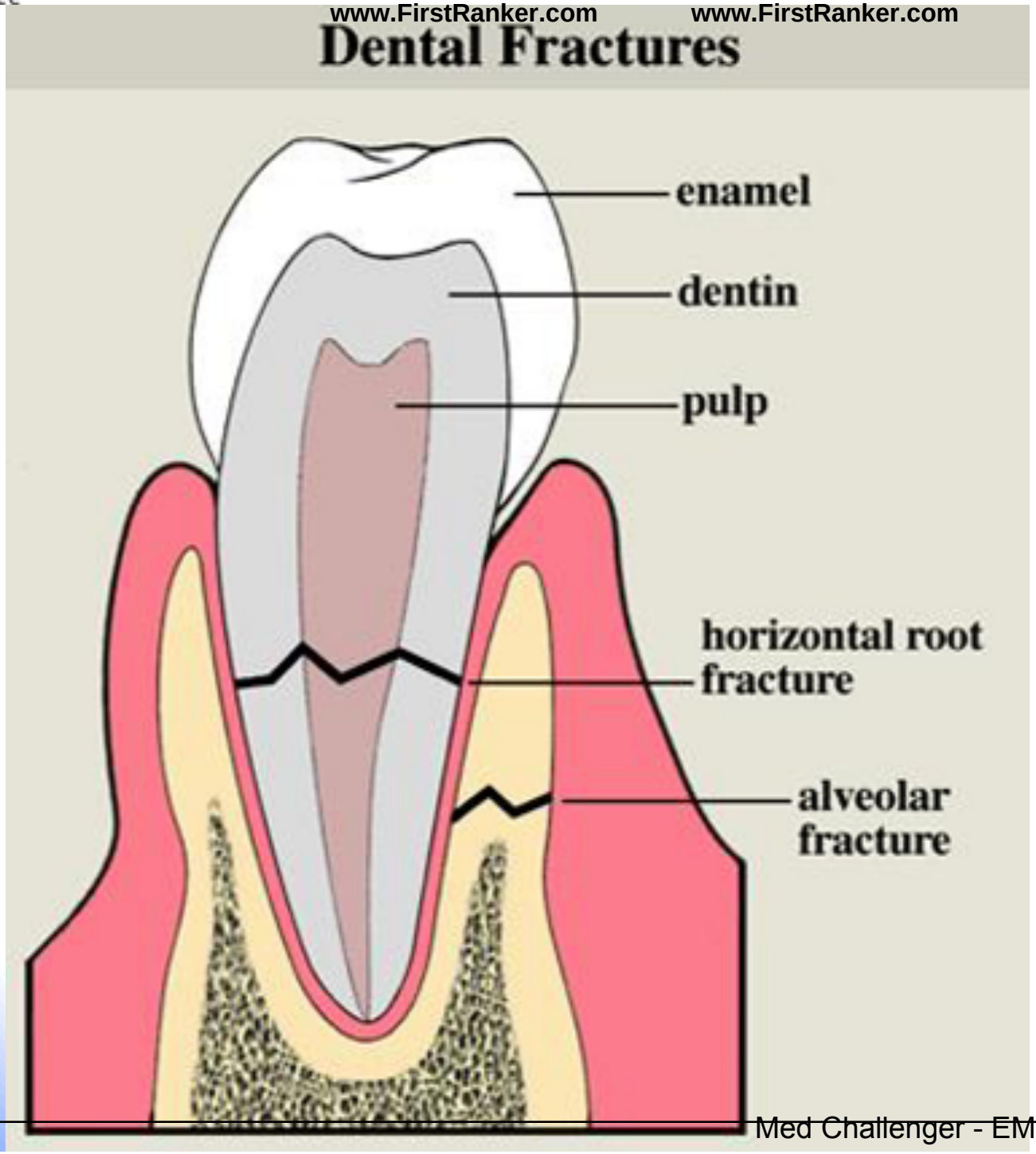
- 2-5 days post-extraction
- Severe pain due to localized osteomyelitis as a result of loss of protective clot
- Risk factors: females on HRT, preexisting tooth and gum infections, traumatic extraction, impacted third molar extractions
- Treatment
  - Anesthetize
  - Irrigate socket
  - Pack with iodoform gauze plus eugenol (a topical anesthetic and antiseptic from clove oil)
  - Antibiotics
  - Early referral



# Avulsed Teeth / Tooth Fracture

- **Replant quickly (1% loss of survival per minute)**
- Rinse first (scrubbing injures periodontal ligament)
- Storage media: saliva, milk. No dry storage
- Only permanent teeth need replantation **(no reimplantation of "baby" teeth)**
  - Bone fusion can prevent permanent teeth erupting
- Tooth fractures exposing dentin (yellowish core) or pulp (reddish blush or frank blood) require early dental referral to prevent infection – pain on air passing over / pain with hot or cold
- Cover exposed dentin with glass ionomer dental cement to decrease contamination – early referral
- Other dental fractures: see dentist for cosmesis and functional issues

# Dental Fractures



# Neck Masses

- Infant
  - Hemangioma, lymphangioma
  - Branchial cleft cyst, rhabdomyosarcoma
- Child
  - Reactive lymphadenopathy
  - Branchial cleft cyst (**laterally located**)
  - Thyroglossal duct cyst (**centrally located**)
- Young adult
  - Reactive lymphadenopathy, mononucleosis
  - Cysts (as above), Hodgkin's disease
- In adults, 75% of lateral neck masses present for more than 6 weeks are cancer

# Neck Masses

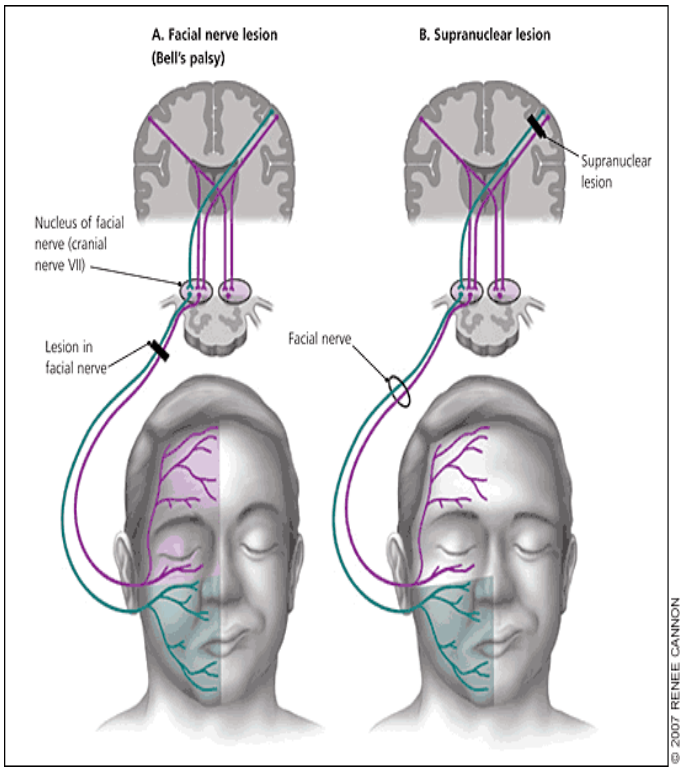
Thyroglossal Duct Cyst

Lymph Node Metastasis

# Facial Nerve Palsy

**Differentiation from central origin: forehead muscles don't work in peripheral seventh nerve lesions**

- Facial droop, can't close eye
- Causes
  - Bell's palsy (idiopathic)
  - Herpes zoster = (Ramsay Hunt Syndrome)
  - Herpes simplex
  - Lyme disease
  - Otitis media
- Treatment
  - If Bell's, steroids (no acyclovir)
  - If not Bell's, treat cause
  - Protect with artificial tears and patch at night to prevent keratitis



# Herpes Zoster Oticus
## (Dr. James Ramsay Hunt Syndrome)

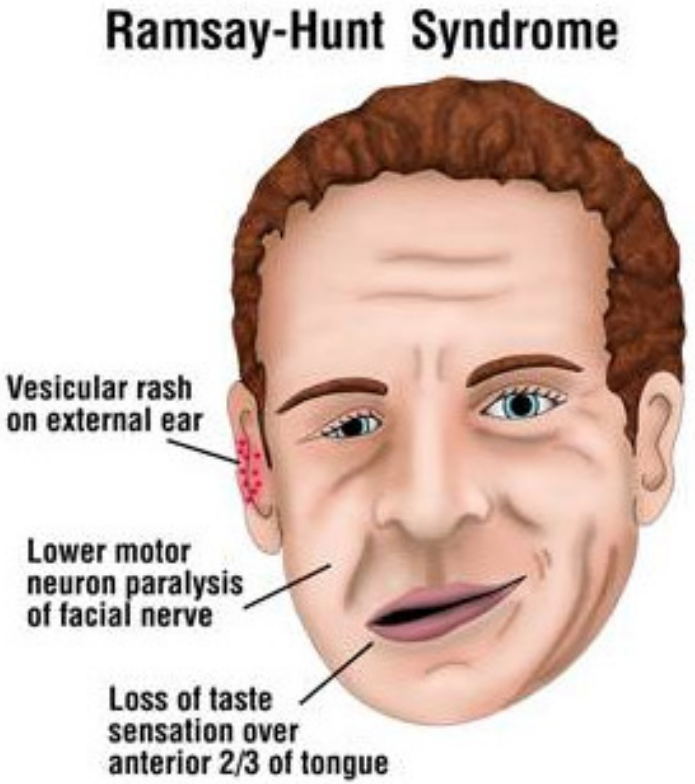
- Caused by reactivation of herpes zoster virus (the chicken pox virus) involving the geniculate ganglion

- The geniculate ganglion causes:
  - Facial movement (via the 7th cranial [facial] nerve)
  - Touch sensation to part of the external ear and canal
  - Taste sensation to the anterior 2/3rds of the tongue

- Additional manifestations:
  - Vesicles in the ear canal, tongue and/or hard palate
  - Can also cause hearing loss, tinnitus and vertigo

- Treatment – early steroids and acyclovir-like drugs

# Ramsay Hunt Syndrome

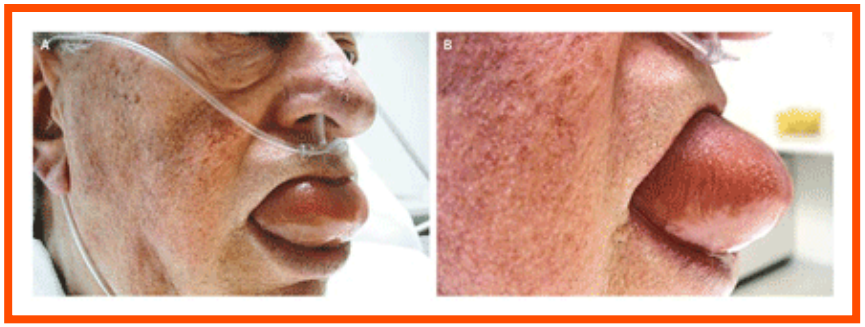



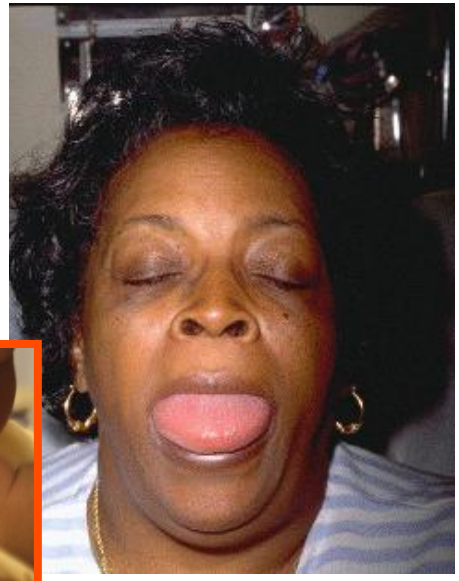
# Herpes Zoster Ophthalmicus

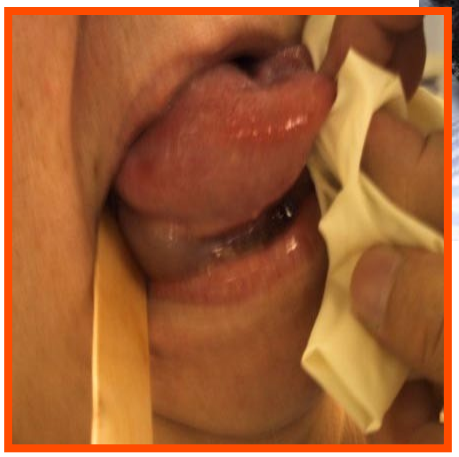
- Involves tissues innervated by the ophthalmic division of the trigeminal nerve
- Eye and eyelid pain / redness, decreased vision, fever, malaise, vesicular rash
- Can also cause keratitis, iritis, glaucoma when the eye is involved
- **Involvement of the nasociliary dermatome (tip, side and root of the nose) is a reliable prognostic sign for sight-threatening cases = Hutchinson's sign**
- Treatment is complex but includes antivirals and steroids

# Tongue Angioedema

- Angioedema - similar to urticaria but involves the deeper dermal and subcutaneous tissue
- Typically involves little pruritus / predilection for face, extremities and male genitalia
- ACE inhibitor angioedema – 0.1-0.2% / Can develop years after starting ACEI treatment
- Cases of angioedema without urticaria could represent C1 inhibitor deficiency
- Hereditary angioedema is an autosomal dominant and can respond to fresh frozen plasma (contains C1 inhibitor)







# Strawberry Tongue / Scarlet Fever

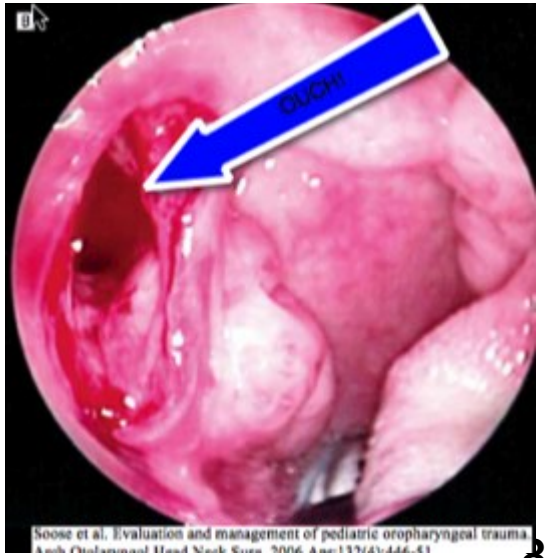
- Caused by erythrogenic toxin producing strains of Group A (and C) beta hemolytic streptococci
- Exudative pharyngitis / fever / headache / sandpaper rash (1-2 days after onset of illness)
- Rash begins in neck, groin and axillae with accentuation over flexure creases (Pastia's lines)
- Antibiotics (penicillin)

# Streptococcal Pharyngitis

- Centor Criteria
  - One point for each = fever / no cough / anterior cervical adenopathy / tonsil exudates
  - McIsaac modification = age younger that 15 add a point / over 45, subtract a point
- Rheumatic fever can be prevented with antibiotic treatment (treatment within 9 days)
- Glomerulonephritis cannot be prevented and is cause by selected nephritogenic strains

# Posttonsillectomy Bleeding

- Most occur 5-10 days post surgery
- Frequency 1-6% of cases / half need surgery
- Most frequent in those 21-30
- Treatment:
  - Direct pressure with gauze held by forceps moistened with thrombin or 1:10,000 epi and 1% lidocaine
  - Silver nitrate cautery if bleeder noted – after infiltration with lidocaine and epi
  - ENT see patient in ED



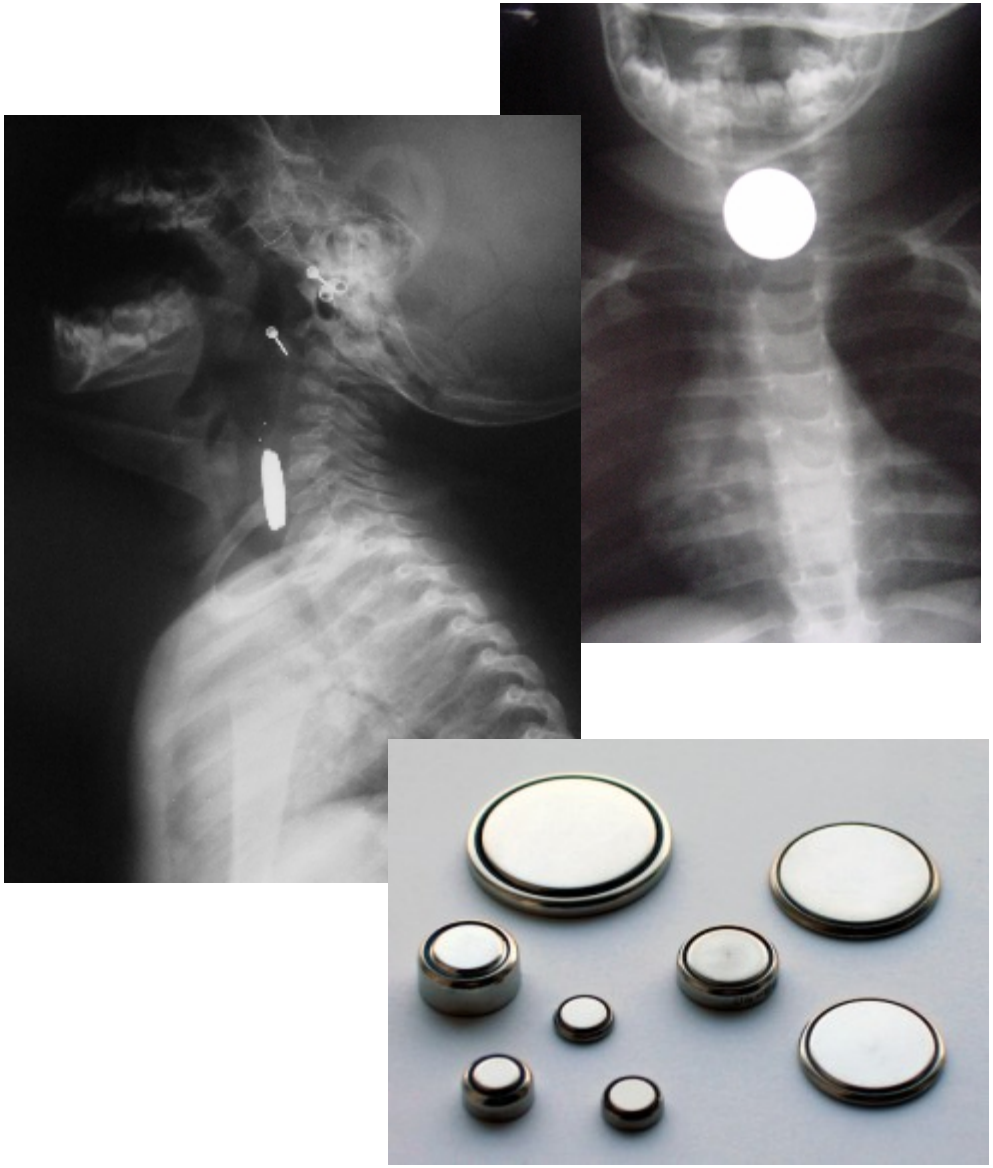
Soose et al. Evaluation and management of pediatric oropharyngeal trauma.

# Uvular Edema (Quincke Syndrome)

- Usually caused by the same causes of angioedema
- Can be associated with upper airway infection
- Often is idiopathic
- Treatment if needed – dexamethasone 4mg IV or PO

# Esophageal Foreign Bodies

- It is very hard to find a picture of a coin in the trachea!!
- Because the posterior tracheal wall is soft tissue and not cartilage, orientation of tracheal coins should be opposite to that seen when in the esophagus
- The addition of a lateral chest x-ray may reveal two coins or the step-off of a button battery



# Zones of the Neck

Zone III

above angle of the mandible

Zone II

between mandible - cricoid

Zone I below cricoid cartilage

# ENT QUESTIONS

# A stridorous, barky cough, high fever and toxic appearance is most consistent with which of the following?

A. Bacterial tracheitis
B. Croup
C. Laryngotracheobronchitis
D. Acute bronchitis
E. Acute bronchiolitis

# Which of the following is most consistent with alveolar osteitis?

A. It occurs about two weeks after tooth extraction
B. It is associated with a localized infection of the bone
C. The area of involvement should be left open
D. Residual clot results in periosteal irritation
E. Antibiotics do not alter the course

**A 30 y/o patient presents with submental fullness and brawny edema following a dental extractions. Which of the following is the most likely diagnosis?**

A. Peritonsilar abscess
B. Ludwig's angina
C. Alveolar osteitis
D. Sialadenitis
E. Buccal cellulitis

**A patient was struck in the face with a baseball bat. He has a nasal deformity and a unilateral mass arising from the septum. What is the most appropriate next step?**

A. CT of the face to diagnose a LeFort fracture
B. Insert a posterior nasal pack
C. Incision and drainage
D. Insert an anterior nasal pack
E. Discharge the patient with analgesics and reassurance.

**A patient presents with a diffusely swollen, warm, reddened, tender external ear after some recent minor trauma. Hearing, along with the TM and canal, are normal. What organism is the likely cause of this process?**

A. H. influenza
B. Streptococcus pyogenes
C. Pseudomonas
D. E. coli
E. Staphylococcus

# Pain on moving the thyroid cartilage, a negative oropharyngeal exam, severe sore throat and a muffled voice suggest which diagnosis:

A. Streptococcal abscess
B. Infectious mononucleosis
C. Epiglottitis
D. Diphtheria
E. Posterior pharyngeal abscess

# Which of the following is a true statement concerning cavernous sinus thrombosis?

A. It is a complication of a central facial infection (dental, sinus, periorbital)
B. Ocular signs are generally not present
C. Cranial nerve deficits are not associated with the diagnosis
D. The patients are generally afebrile and nontoxic appearing
E. Seizures are common

# Which of the following is true of diphtheria?

A. Symptoms are largely limited to the pharynx
B. Elaboration of exotoxin is a major source of the pathology
C. It is unnecessary to treat carriers
D. Prominent exudates characterize the infection
E. Cervical adenopathy is uncommon

**A patient is suspected of having bacterial sinusitis. Which of the pathogens below is the most likely cause (PS, it is also the most likely cause of bacterial otitis media)**

A. M. catarrhalis
B. H. influenza
C. M. pneumoniae
D. S. pneumoniae
E. C. pneumoniae

# Which of the following is associated with an enlargement of the prevertebral soft-tissue on a lateral neck imaging?

A. Peritonsillar abscess
B. Ludwig's angina
C. Epiglottitis
D. Retropharyngeal abscess
E. Idiopathic uvulitis

# Which of the following is a true statement regarding salivary gland disorders?

A. Calculi are more commonly associated with the parotid gland vs the submandibular
B. Calculi are rarely radio-opaque
C. Parotid duct injury should be considered when the facial nerve, over the cheek, has been injured
D. Pus draining from the parotid duct is usually caused by streptococcal infection
E. Needle aspiration is indicated for suspected abscess

# Which of the following is true statement concerning infectious mononucleosis?

A. Use of ampicillin frequently triggers a rash that does not indicate a true allergy
B. Anterior cervical chain lymph nodes are pathognomic for the diagnosis
C. Most of the population is seronegative for prior EB-virus exposure
D. Transaminase levels are rarely elevated
E. White cell morphology is usually normal

# Which of the following is consistent with the diagnosis of trench mouth (acute necrotizing ulcerative gingivitis)?

A. Older adults
B. Gum trauma from excessive brushing
C. Reddened, painful, swollen gums with halitosis
D. Generally resistant to treatment with penicillin and metronidazole.
E. Painless

# Which of the following is routinely associated with a LeFort I fracture?

A. CSF rhinorhea
B. Mobility of the maxilla
C. Airway compromise
D. Extensive bleeding
E. Malocclusion

# Regarding dental emergencies, which of the following statements is correct?

A. An avulsed tooth in a 4-year-old should be replaced in the socket

B. Reversible pulpitis is characterized by dull, boring, pain precipitated by hot food

C. Periapical abscesses are the most common cause of severe tooth pain

D. The antibiotic of choice for dental infections is ciprofloxacin

E. Pericoronitis is common after third molar extractions

# Which of the following statements accurately describes benign paroxysmal positional vertigo?

A. A negative Hallpike test is confirmatory
B. BPV is caused by free floating otoliths in the semi-circular canals
C. These symptoms typically last for years
D. This finding is caused by excess endolymph volume
E. Men are affected twice as often as women

# A 75 y/o patient presents with anterior epistaxis. BP = 210/115. Which of the following is the most appropriate next step?

A. Administer clonidine P.O.

B. Put the patient in a supine position for comfort with ice packs to the forehead

C. Stop the bleeding

D. Administer labetalol IV

E. Reassure and calm the patient and wait for the blood pressure to normalize

# Which of the following is consistent with herpangina?

A. 2-4 day duration
B. Caused by Coxsackie virus
C. Vesicular lesions are uncommon
D. Rarely associated with fever
E. Lesions are limited to buccal mucosa, gingiva and tongue

# A 23 y/o patient reports yawning and subsequently could not move her jaw. Which is true regarding the most likely diagnosis?

A. The mandibular condyle dislocates posterior to the articular surface

B. The mouth will be closed due to associated trismus

C. Reduction is performed by downward and backward pressure on the mandible

D. Dislocations are commonly associated with condylar fractures

E. The mandible can only dislocate bilaterally

# Which of the following is consistent with central vertigo?

A. Sudden onset
B. Intermittent
C. Not exacerbated by movement
D. Associated with intense “spinning”
E. Moderate hearing loss is usually present

# ENT Answer Key

1. A
2. B
3. B
4. C
5. C
6. C
7. A
8. B
9. D
10. D
11. C
12. A
13. C
14. B
15. C
16. B
17. C
18. B
19. C
20. C