Complications of suppurative otitis media

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Objectives

1.The definition of copmplications of SOM..

2.To know the intratemporal complicationsof SOM.

3.To know the intracranial complications of SOM..

4.To know types and treatment of mastoid abscess.

Complications of suppurative otitis media

Definition: Is Spread of infection beyond the muco- periosteal lining of the middle ear cleft.

The complications usually occur in the course of chronic suppurative otitis media of the unsafe type with cholesteatoma.

*less commonly occur in

**chronic otitis media without cholesteatoma(safe type)

**acute otitis media. Because of early treated with antibiotics rarely leads to complications .

* Common route of spread of infection .are bony erosion by cholesteatoma. And hyperemic decalcification in ASOM.

Complications of suppurative otitis media.

I: Intratemporal complications.

1.Mastoiditis (Acute,Masked,Chronic).

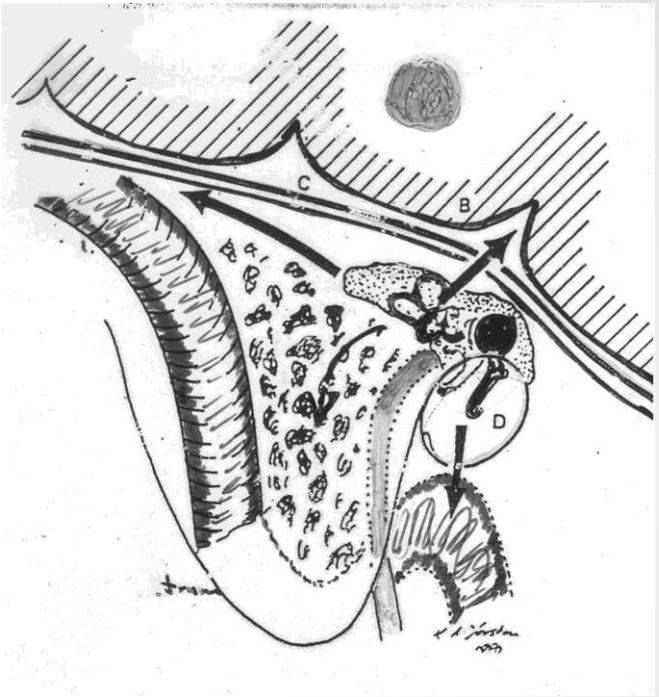
2.Petrositis.

3.Labyrinthitin complications .

A. Labyrinthitis

B.labyrinthin fistula.

4.Facial nerve paralysis.



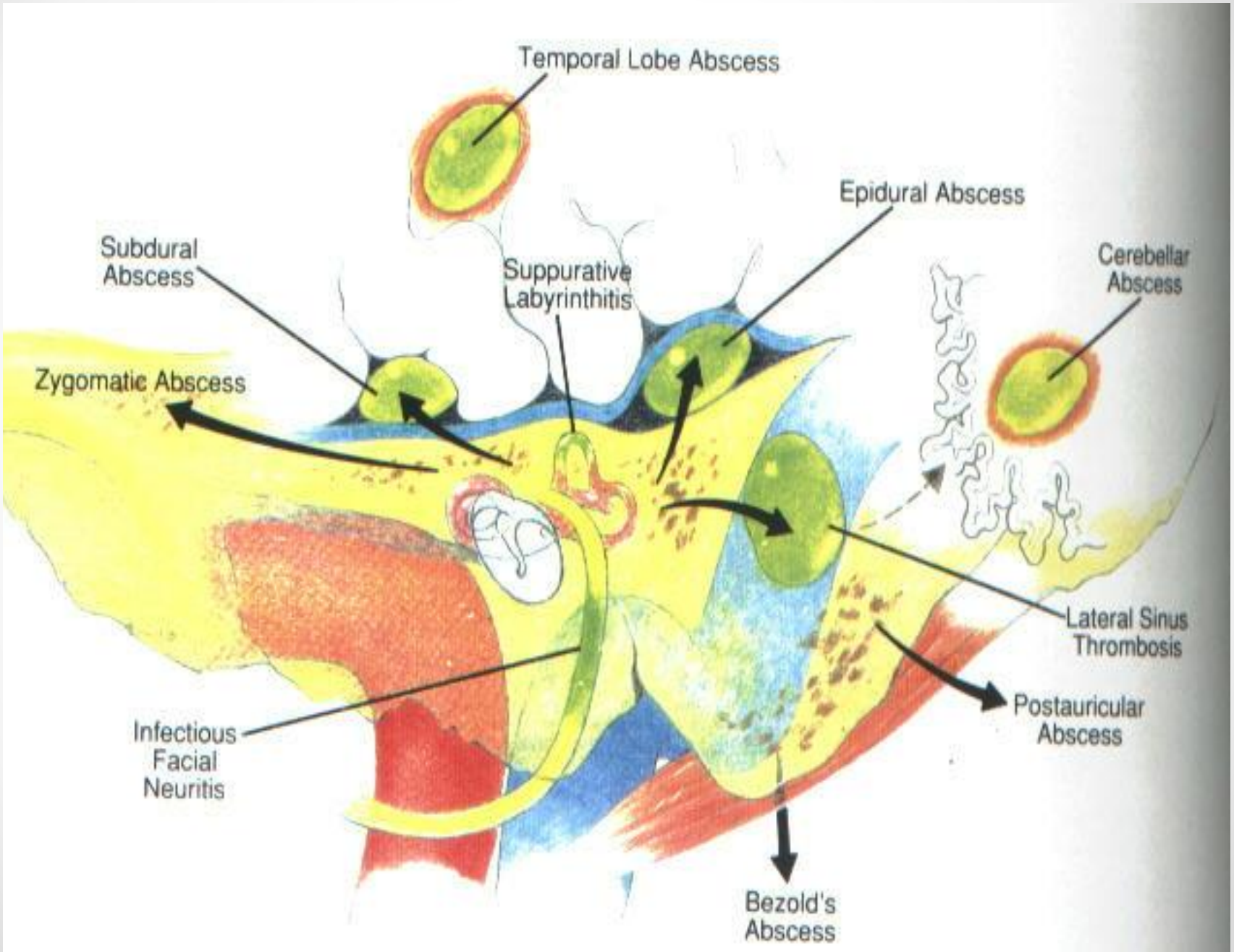
II.Intracranial complications

1. Extradural abscess
2. Subdural abscess
3. Meningitis
4. Brain abscess:
   a. Temporal lobe abscess.
   b. Cerebellar abscess.
5. Lateral sinus thrombosis/thrombophlebitis
6. Oitic hydrocephalus (Benign intracranial hypertension).

III. Extra cranial Extra temporal complications.

1.Mastoid abscess. 2.Otitis externa.

Complications of suppurative otitis media



1.Mastoiditis :

It can be

A. Acute Mastoiditis.

B. Subacute (Masked) mastoiditis.

C. Chronic mastoiditis

A.Acute mastoiditis :

Is suppurative inflammation of mastoid air cells in the temporal bone.

It is the most common intratemporal complications of acute suppurative otitis media.

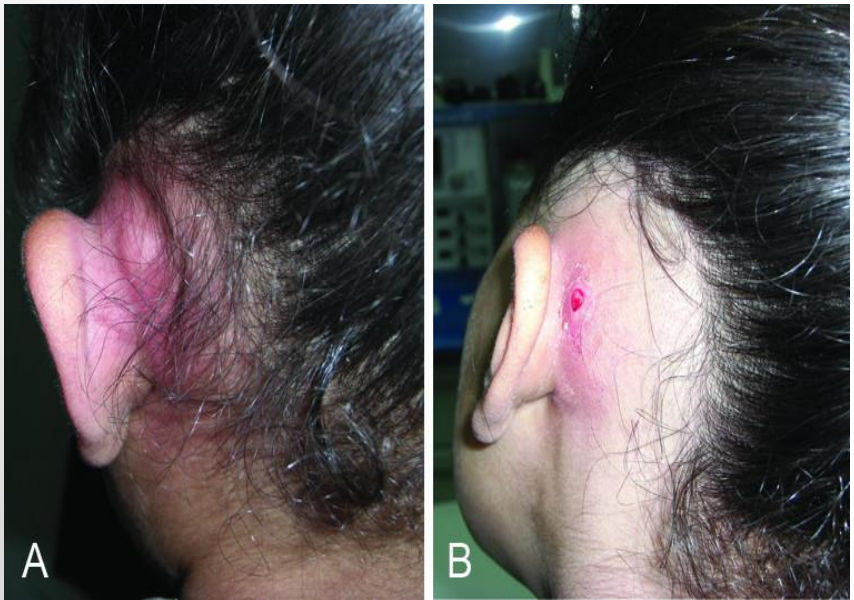
Frequently in children than adult . It not occurs in sclerotic (acellular)mastoid.

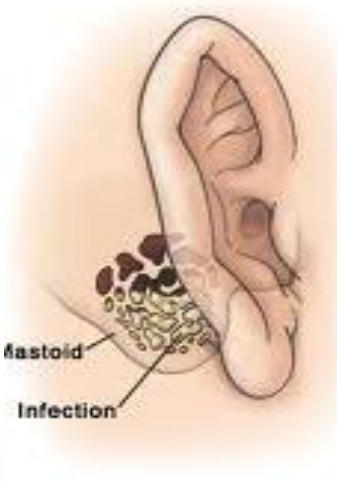
Causative organisms The most common pathogen is *Streptococcus pneumoniae. Streptococcus pyogenes, H.influenzae, Staphylococcus aureus.*

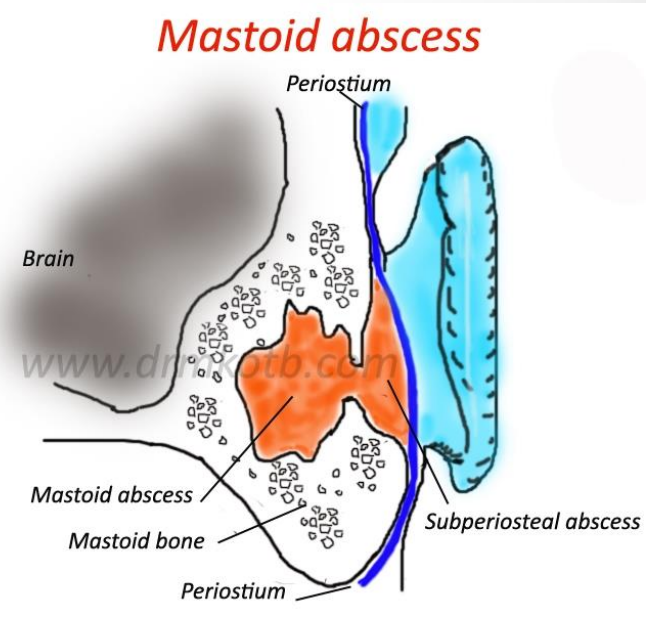
Progress of acute mastoiditis

Acute mastoiditis progresses in the following stages and may be arrested at any point.

1. **Suppurative inflammation of mastoid air cells leads to**
2. **Destruction of bony septa(osteitis) then**
3. **Accumulation of pus in large mastoid cavity(coalescent mastoiditis)**
4. **Extension by destroy of bony boundaries laterally causes subperiosteal or mastoid abscess.**
5. **May rupture causes fistula.**







Clinical features of acute mastoiditis :

Symptoms.

1.**Pain:** Is sever throbbing pain(otalgia).

2.**Discharge(otorrhea)when perforated tympanic membrane.**(Otorrhea that persists longer than 3 weeks is the most consistent sign that a chronic process involving the mastoid has evolved.)

3.**Fever, rapid pulse.**

4.**Hearing loss (conductive HL).**

Sign.

1. **Protrusion of the auricle**, due to sever odema, the pushed downward outwards.

2.**Tenderness and oedema** over mastoid antrum in infants, and with mastoid tip in adults.

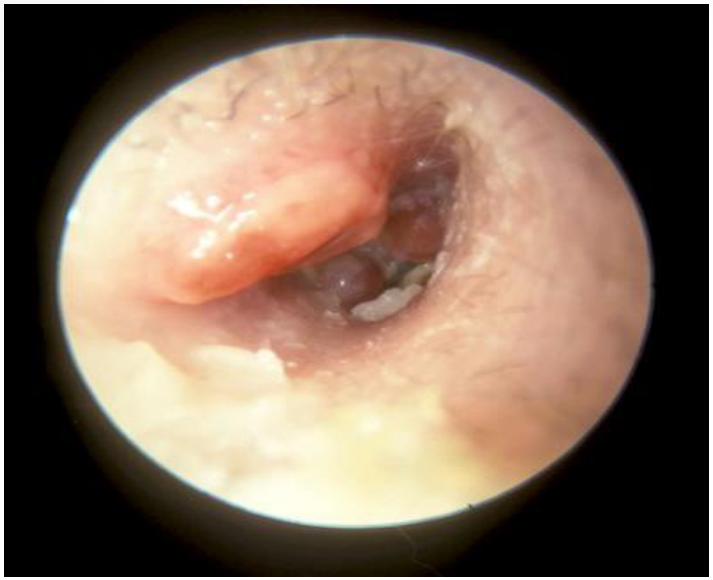
3.**Otoscopy.**

*The tympanic membrane either intact congested or bulging , or perforated (in parse tensa)with pus flowing or pulsating.

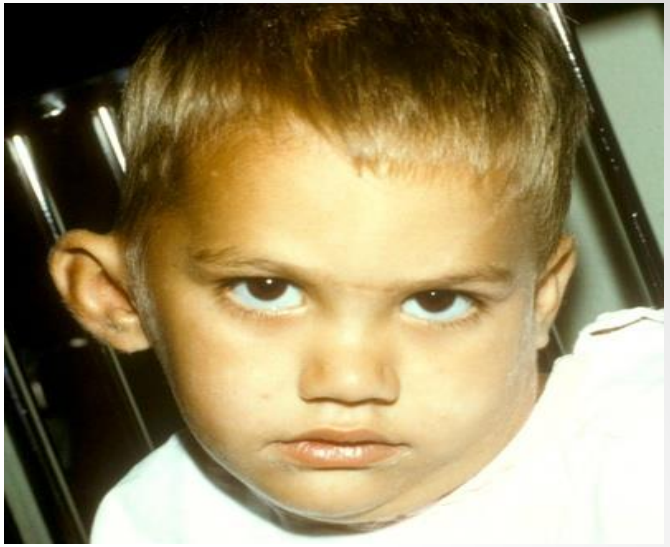
*Sagging of posterosuperior canal wall(narrow external auditory canal with depression of roof of the meatus)

mastoiditis

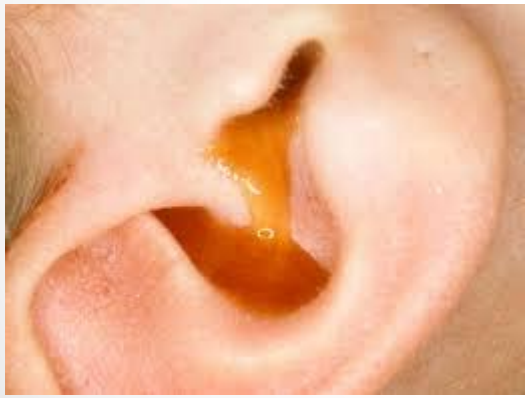
Acute



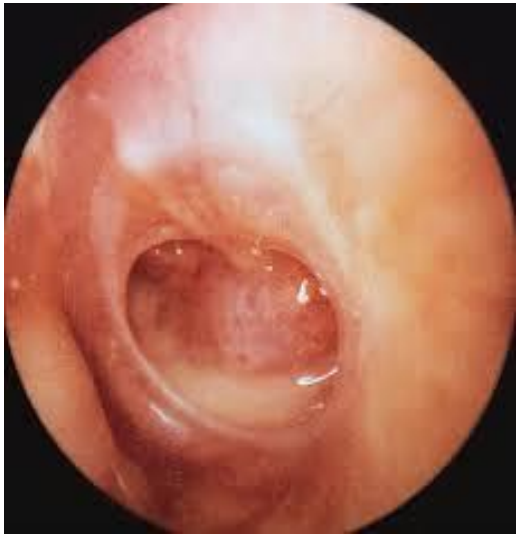
Sagging of posterosuperior canal wall



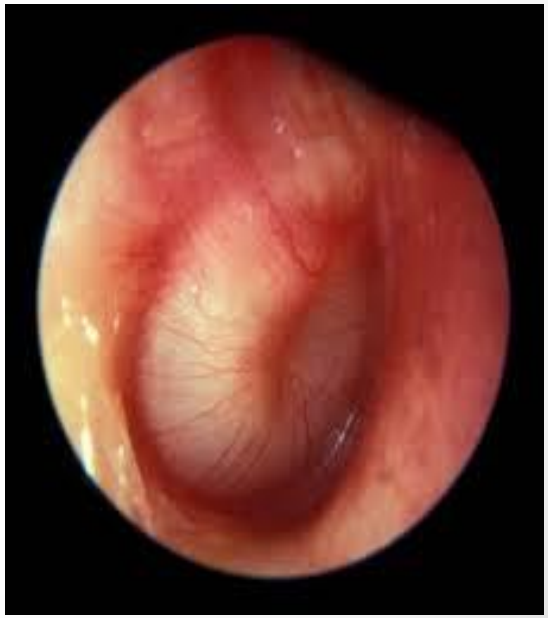
- Protrusion of auricle



otorrhea



Perforated TM



Bulging red tympanic membrane

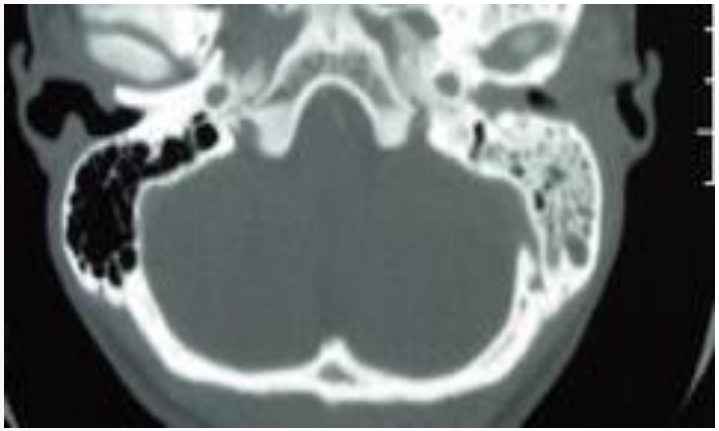
Investigations.

*Blood test. Increased WBC count. Leukocytosis.

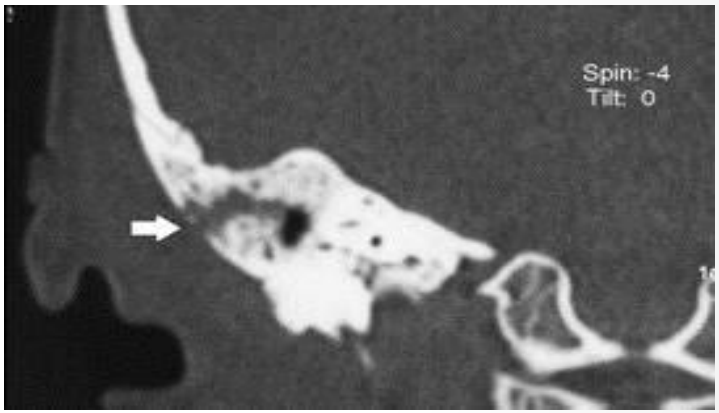
*Ear swab,aspiration of middle ear for Culture/Sensitivity test

*Mastoid plain X-ray.: Cloudy mastoid air cells in early stage and loss of bony septum and coalescence in later stage.

*CT scan. Early bone destruction and extent of infection.



CT- Scan=Acute mastoiditis.



Mastoid abscess

Treatment of acute mastoiditis:

1.Antibiotics: Initially treated with IV antibiotics. Culture and gram-stain directed therapy is optimal.

The antimicrobial therapy recommends are

*Vancomycin plus Ceftriaxone as empiric therapy. Or

*Combination of a penicillin with a beta-lactamase inhibitor (ex, ampicillin-sulbactam, piperacillin-tazobactam,

* Parenteral therapy should be given for at least for 7-10 days.

* Oral therapy (When improvement occurred) for a total of 4 weeks. Includes *Clindamycin + Third-generation cephalosporin (like Cefpodoxime proxetil (cefodox),Cefdinir .Or

* Amoxicillin plus clavulanic acide.

2. Myringotomy. When intact Tympanic membrane to drain the pus.

3.decongestant (Local,systemic)and analgesia.

4 .Cortical mastoidectomy. (Schwartz operation).

Inications ;

A. Failure of medical treatment.

B. Mastoid abscess when subperiosteal is rupture subcutaneously.

C. Suspected intracrainial complications.

**. In infants. Drain of mastoid abscess only.

Differential diagnosis of acute mastoiditis

1. Furunclosis
2. Post auricular lymph node.
3. Erysipellus.
4. swelling over mastoid (sebaceous cyst, lipoma).
5. Fibrositis of SternoMastoid muscle.

B. Masked mastoiditis:

Definition: Incompletely resolved acute mastoiditis.

Etiology:Insufficient medical treatment which controlled the acute symptoms but did not eradicate the infection completely.(in adequate dose , short duration.)

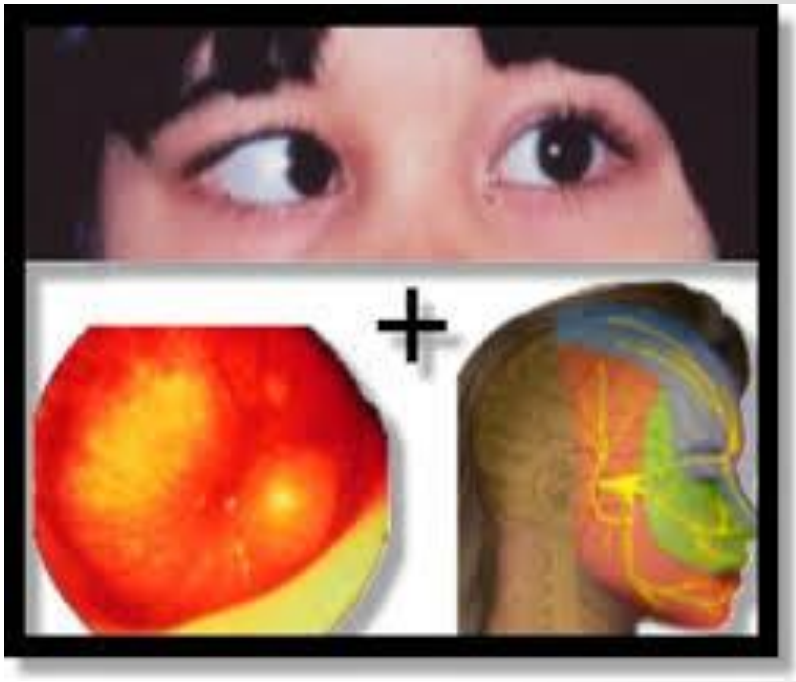
C. Chronic mastoiditis: Chronic suppurative otitis media.

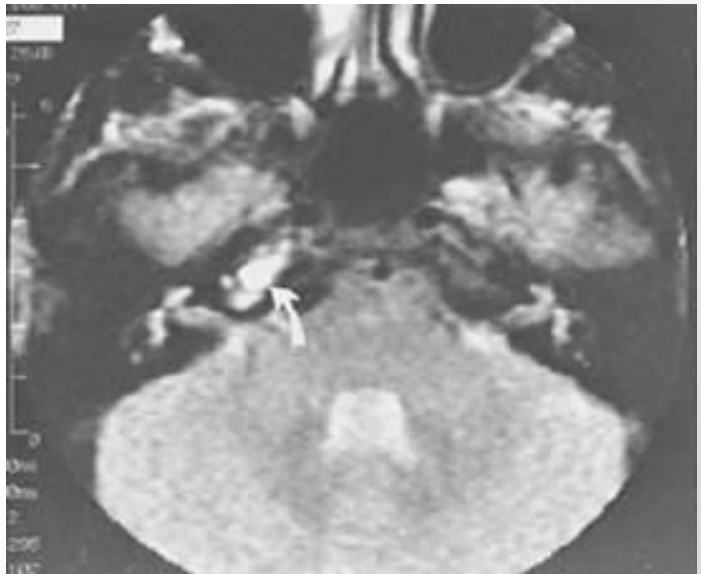
2.PETROSITIS (PETROUS APICITIS).

An extension of infection from the middle ear into a pneumatized petrous apex via retrolabyrinthine aircells.

Called **Gradenigo's syndrome**. There are

1. **Otorrhea and hearing loss ,suppurative Otitis media**;.
2. **Retro-orbital pain**. due involvement of V nerve
3. **Diplopia and Converging Squint**; lateral rectus palsy due to abducent (IV) cranial nerve palsy in Dorello's canal at petrous apex.under Gruber's petro-sphenoid ligament.





Treatment.

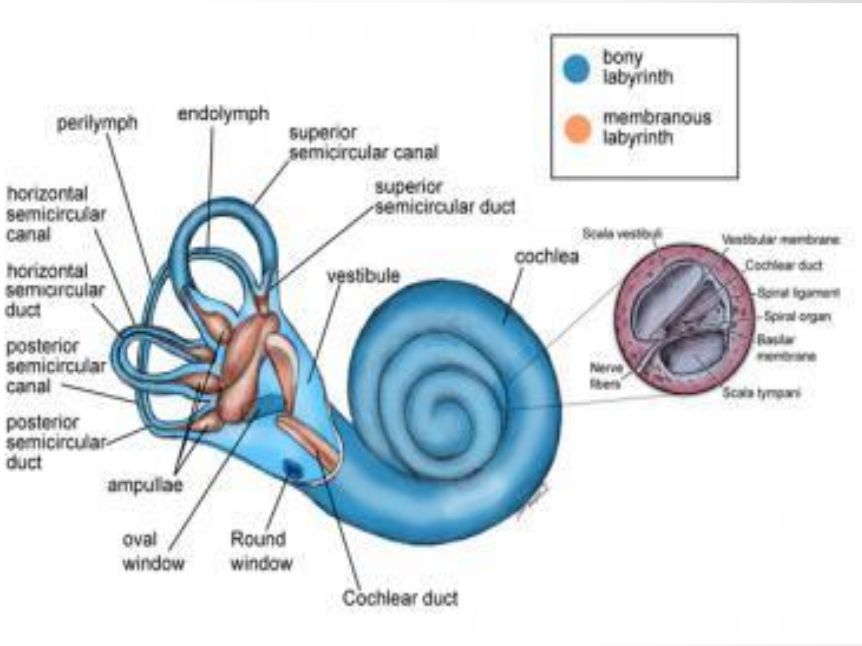
1.Antibiotics.

2. Mastoidectomy with drainage of the apical cells.

3. Labyrinthitin complications.

A.Labyrinthitis :

Is inflammation of endosteal layer of bony labyrinth (inner ear).



Clinical features:

1. **Vertigo**
2. **Nausea and vomiting.**
3. **Nystagmus towards the opposite side.**
4. There may be a **positive *fistula test***
5. **Sensorineural hearing loss**

Treatment:

Medical treatment:*Bed rest. *Labyrinthine sedative(Stugeron,stemetil).

*I.V. antibiotics .

*Observations for sign and symptoms of meningitis.

Surgical treatment; Better after7-10 days avoid premature surgical treatment leading to dissemination of infection)So when acute symptoms of suppurative labyrinthitis subsided

***In ASOM** Cortical mastoidectomy.

***In CSOM**. Mastoid exploration and eradicte infection and dealing with labyrinthin fistula.

B.Labyrinthin fistula:

Definition :Loss of the bony labyrinthine wall exposing the endosteum mostly dome of the lateral semicircular canal exposed by bony erosion by a cholesteatoma.

it suspected when patient with CSOM complaining from episodes of vertigo or unsteedness.or may be silent discovered during mastoid exploration.

Diagnosis;

***Fistula sign +ve**

(pressure on the tragus causes vertigo)

*use of Siegal pneumatic speculum

***CT-scan**.(bony erosion)

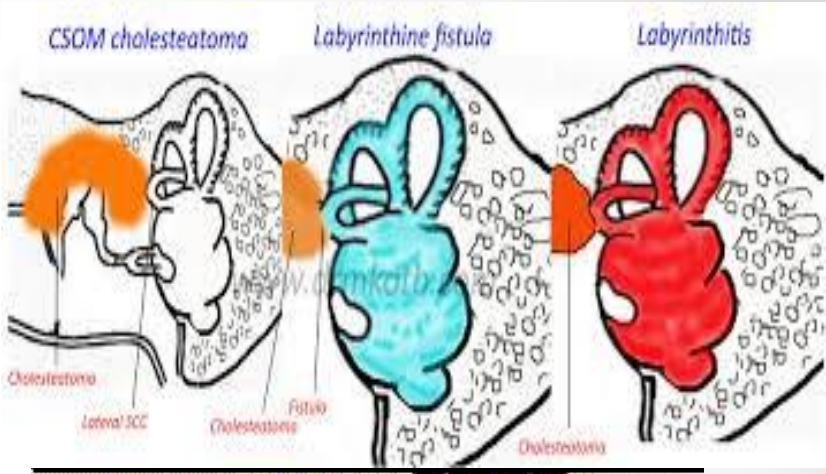
***surgical exploration.**

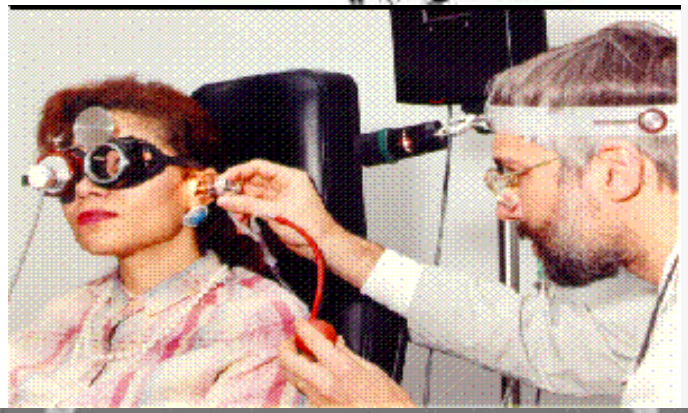
Treatment;

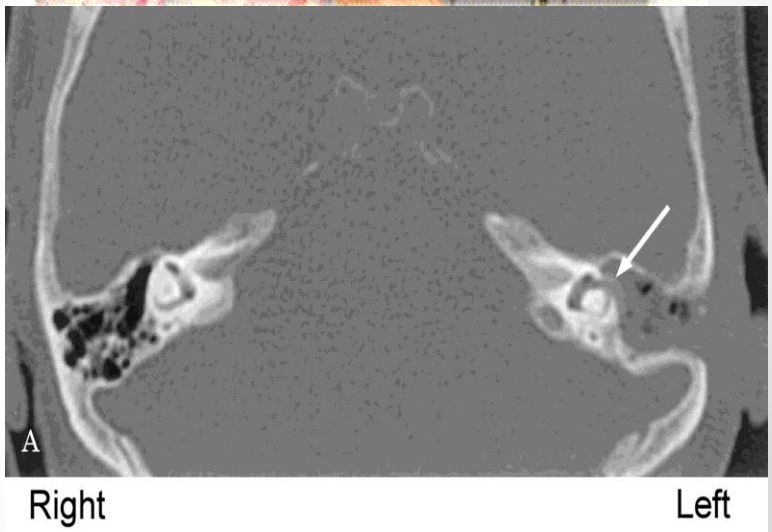
Mastoid Exploration

remove cholesteatoma mass,

the defect covered with fascia.

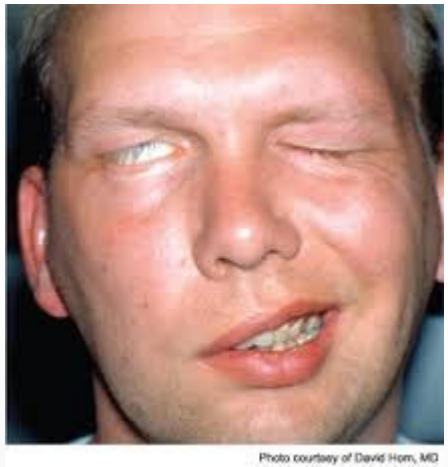






4.Facial nerve paralysis.

- **A.In acute suppurative otitis media and mastoiditis**.
- Occurs when congenital dehiscence of facial nerve.(usually horizontal part) and infection of mucosa may causes inflammatory reaction in epineural or perineural space of the VII n.
- **Treatment** :Usually neuropraxia and fully recovery occurs after cure of infection so treatment as for acute mastoiditis
- **B. In chronic S.O.M** .When the facial nerve exposed due to* erosion of facial canal by cholesteatoma and the inflammatory reaction occurs. Or* pressure of the sac on the nerve or by granulation tissue.
- **Treatment** .Urgent mastoid exploration(MRM.RM).
- *Facial n. decompression may needed.



II: Intra-cranial complications

The symptoms :

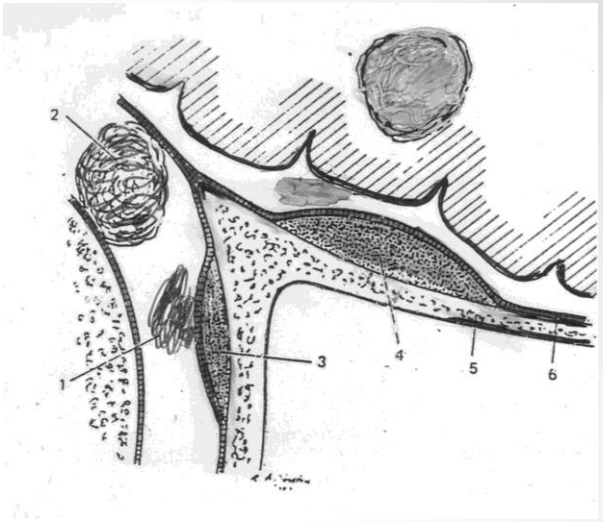
Patient with suppurative otitis media gets the following symptoms that alert to suspicion of intracranial spread of infection.

*Head ache.*Fever,*Nausea and vomiting(projectil),

* papilledema(Visual failure)

*vertigo and dizziness.

*Fit, paralysis or other focal neurological signs.



Intracranial complications

1. **Extradural abscess**: The commonest intracranial complication, Collection of pus between the dura mater an more superficial bone.
2. **Subdural abscess**. Collection of pus between duramater and brain.
3. **Meningitis:** Is inflammation of the meninges of the brain and spinal cord; caused by invasion of the cerebrospinal fluid by an infectious organism, *Inflammation of the pia mater and arachinod is called **leptomeningitis;** *Inflammation of the dura mater,called **pachymeningitis.**

***CSF examinations**. (avoid lumber puncture in increase ICP to avoid conning)

*In meningitis (Turbid ,high pressure, High protein and cells (PMNs). Low chloride and sugar).and positive culture

4. **Brain abscess:** 50% of brain abscess is Otogenic.

It is of two types

a. Temporal lobe abscess.

b. Cerebellar abscess.

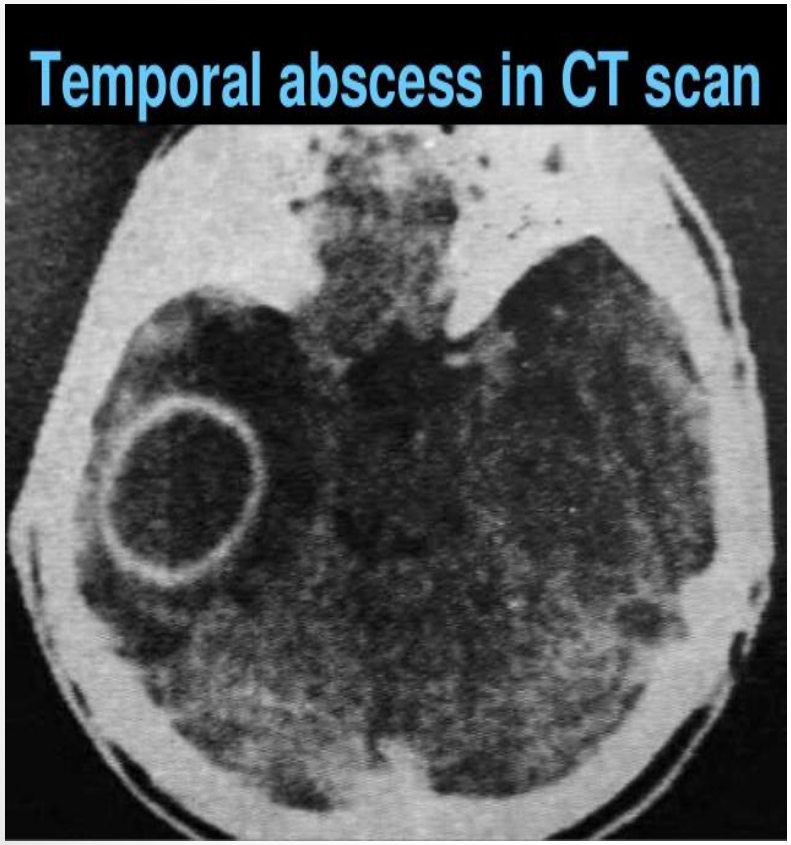
Radiological study;

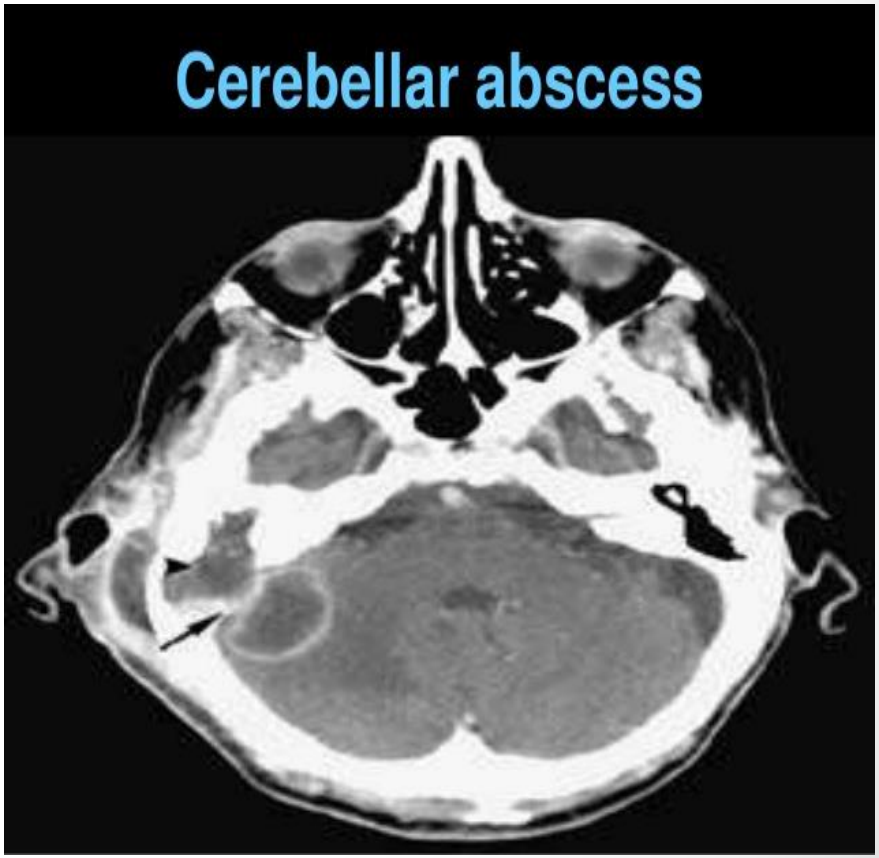
A.CT scan (of brain and temporal bone with contrast)

B.MRI,MRA Angiography.

For1. Identify and localized the intracranial complication,(abscess,lateral sinus thrombosis,..))

2. Monitoring during treatment ex. brain abscess.





5. Lateral sinus thrombosis/thrombophlebitis

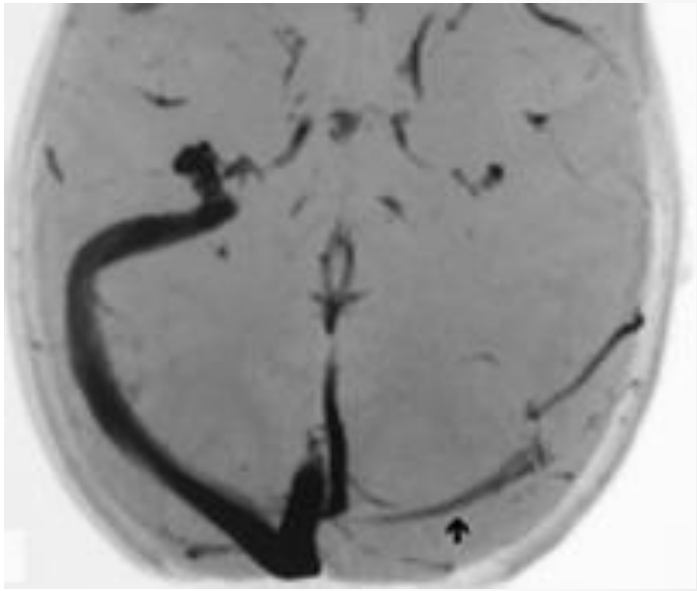
Spread of infection from mastoid to the sigmoid sinus.

1 .May be **silent.(Thrombosis).**

2 . **Thrombophlebitis.**

6.Otitic hydrocephalus.

A benign intracranial hypertension associated with ear disease. due to obstruction to drainage of CSF .



Axial MR venogram shows absence of normal venous flow with occlusion at the level of the mid transverse sinus on the left side and some evidence of adjacent collateralization (arrow).

Principles of treatment of intracranial complications

1.Systemic large dose of parentral antibiotics

The drug chosen on probability without waiting for culture and sensitivity test, then changes depending on clinical response and bacteriological report.

*In acute suppurative otitis media =ceftriaxone +vancomycin i.v

*In chronic suppurative otitis media =Ciprofloxacin PO +clinamycin. /Piperacillin/tazobactam IV (Zosyn)

2.Treatment of local neurological complications .

* Brain abscesss (Aspiration,Excision).

*Extra dural and subdural abscess drains with ear surgery

3.Treatment of ear disease.

*In ASOM =Myringotomy+cortical mastoiectomy.

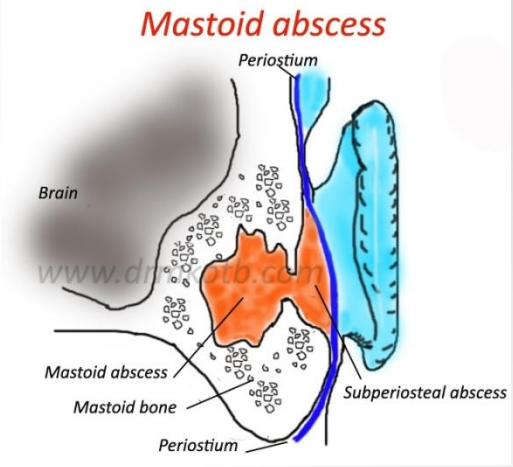
*In CSOM =Mastoid exploration(Modefied radical mastoidectomy,Radical mastoidectomy ,Tympanoplasty according to peroperative findings

* In lateral sinus thrombophlebitis Open lateral sinus to remove clot; if pus in sinus, evacuate pus, rarely ligation of internal jugular vein to prevent dissemination of infected clot.

***Decrease ICP .Dexamethazone,Mannitol,Antiepileptic when needed.**

*** Otitic hydrocephalus; Repeated lumber puncture (drain),and Ventriculo-peritoneal shunt may needed.)**

III.Extracranial extratemporal complications. Mastoid abscesses



Is subperiosteal or subcutaneous collection of pus due to destruction of mastoid cortex in mastoiditis.

Types of mastoid abscess

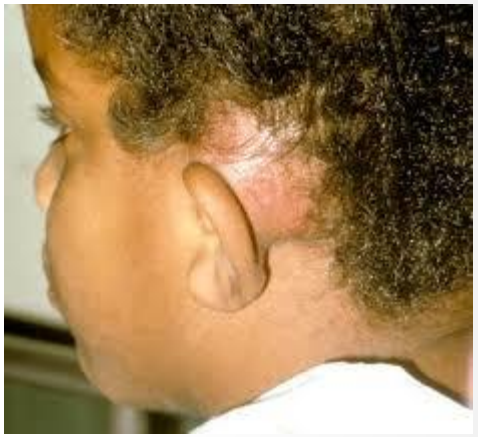
1. **Post auricular abscess**. The commonest.
2. **Bezold's abscess**: Spread through a perforation in the mastoid cortex at mastoid tip along deep to insertion of SCM.
3. **Luc's abscess** : **swelling** along the posterior bony part of the external auditory canal
4. **Zygomatic abscess**. Root of zygoma .
5. **Citelli's abscess** ; neck swelling over posterior belly of diagastric.

over occipital bone

6. **mouret's abscess**; para pharyngeal space.

Treatment :drainage + cortical mastoidectomy.

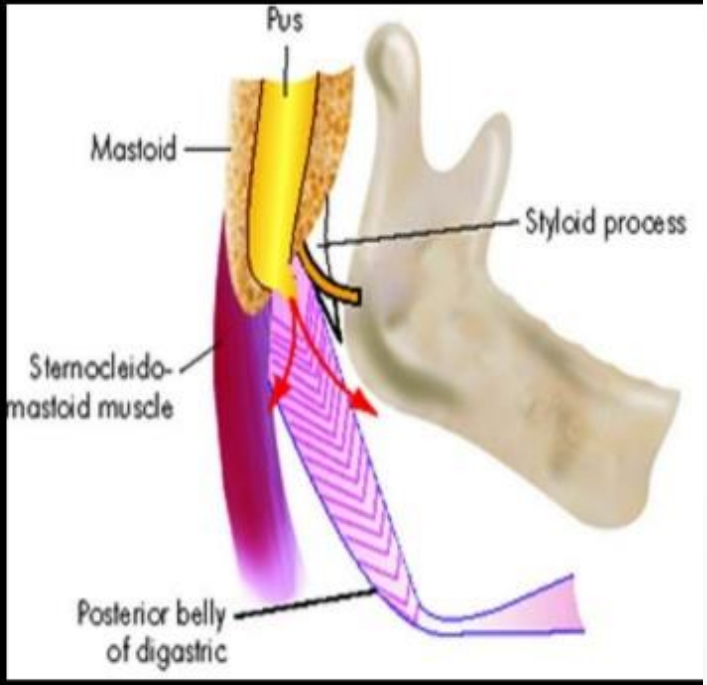
* **In infants**. Drain of mastoid abscess only.



Bezold & Citelli abscesses

Bezold: neck swelling over sternocleido-mastoid muscle

Citelli: neck swelling over posterior belly of digastric muscle



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