

Complications of otitis media

❖ Intratemporal:

1. Mastoiditis (acute and subacute).
2. Tympanosclerosis.
3. Atelectasis of tympanic membrane.
4. Petrositis.
5. Facial nerve paralysis.
6. Suppurative labyrinthitis

❖ Intracranial:

1. Meningitis.
2. Intracranial abscess (brain, subdural and extradural).
3. Lateral sinus thrombosis.
4. Otic hydrocephalus.

Acute mastoiditis (con...)

- ❖ Extension of AOM into mastoid air cells with suppuration and bone necrosis.
- ❖ Symptoms:
 - Fever.
 - **Pain** over mastoid process (persistent and throbbing).
 - Ear discharge (creamy and profuse).
 - Increasing deafness.



Acute mastoiditis (con...)

❖ Signs:

- Tenderness over mastoid antrum.
- Tympanic membrane is either perforated and the ear discharging or it is red and bulging (If the tympanic membrane is normal, the patient **doesn't** have acute mastoiditis).



Acute mastoiditis (con...)

- Swelling in postauricular region leads to anteroinferior displacement of pinna.



Acute mastoiditis (con...)

❖ Occasional features:

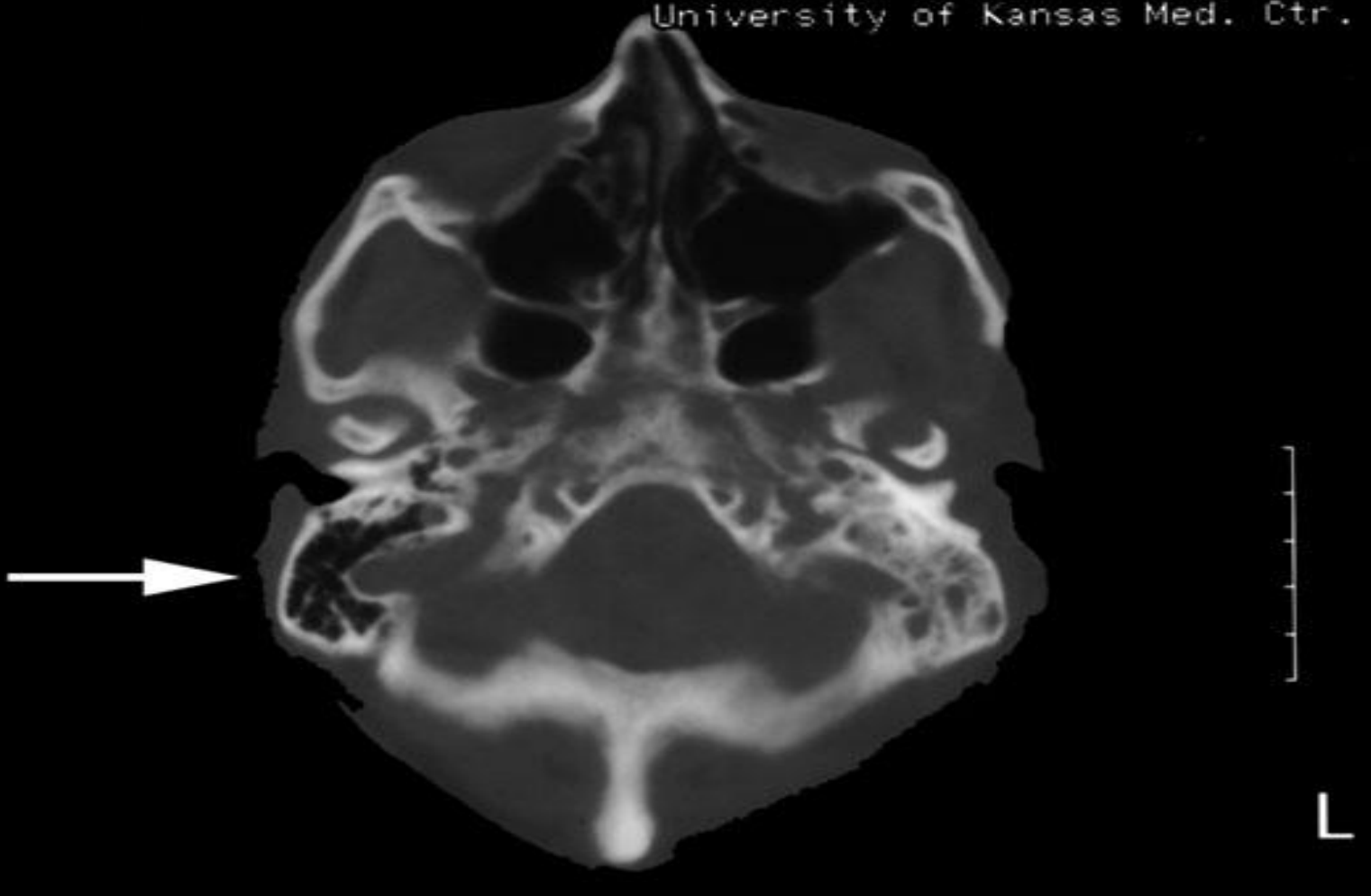
- Subperiosteal abscess over mastoid process.
- Bezold's abscess (pus breaks through mastoid tip and forms abscess in neck).
- Zygomatic mastoiditis.

❖ Investigations:

- CBC (increase WBC counts).
- CT scan (opacity and air cell coalescence).

Acute mastoiditis (con...)

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Acute mastoiditis (con...)

❖ Treatment:

- **IV antibiotics** (depends on sensitivity of organisms).
- **Cortical mastoidectomy:**
 - If there is a subperiosteal abscess or if the response to antibiotics is not rapid and complete.

2. Subacute mastoiditis

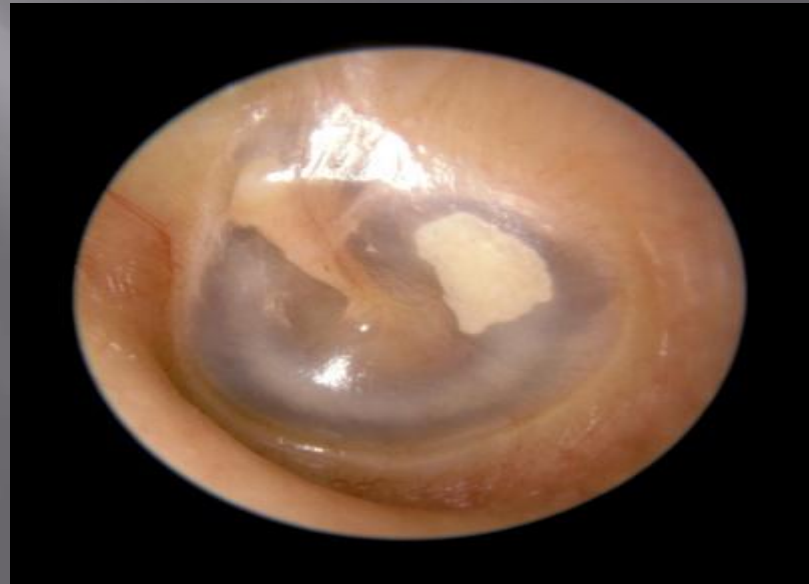
- ❖ Occur when inadequate treatment of AOM results in low-grade infection of mastoid air cells.
- ❖ Symptoms and signs are equivalent to those of acute mastoiditis but **less severe**.
- ❖ Most cases resolve with ventilation of middle ear combined with antibiotic.
- ❖ If this treatment fails, cortical mastoidectomy is indicated.

Tympanosclerosis

- ❖ Hyalinization and deposition of calcium in **tympanic membrane** and **middle ear**.
- ❖ Seen after recurrent episodes of AOM and OME and after ventilation tube insertion.
- ❖ If the process is limited to tympanic membrane (**myringosclerosis**) then hearing is usually unaffected.
- ❖ If the middle ear is involved, then ossicular chain can become immobilized, resulting in conductive hearing loss.

Tympanosclerosis (con...)

- ❖ Clinical appearance is white plaques in tympanic membrane.



- ❖ Surgical correction by **tympanoplasty** may initially be successful, but refixation of ossicles not uncommon.

Atelectasis

- ❖ Retracted or collapsed tympanic membrane.
- ❖ Result of prolonged negative middle ear pressure secondary to chronic eustachian tube dysfunction.
- ❖ Atelectatic tympanic membrane may **not** produce any symptom, but more commonly results in mild conductive hearing loss.



Atelectasis (con...)

- ❖ Prolonged contact between tympanic membrane and ossicles can result in ossicular erosion, more significant hearing loss.
- ❖ Persistent atelectasis cause abnormal migration of squamous epithelium from tympanic membrane, leading to accumulation of squamous debris and **cholesteatoma formation**.



Atelectasis (con...)

❖ Treatment:

- If eustachian tube dysfunction is still consider to be present, the **insertion of ventilation tubes** could potentially reverse the changes in tympanic membrane by normalizing the pressure in middle ear space.
- If subsequent cholesteatoma formation, then excision and grafting of the affected portion of the tympanic membrane are recommended.

Petrositis (Gradenigo syndrome)

- ❖ Rare complication of suppurative OM occurs in both chronic and acute forms.
- ❖ In **acute form**, there is extension of acute mastoiditis into pneumatized petrous apex.
- ❖ The **chronic form** usually occurs as result of mucosal or cholesteatomatous.

Petrositis (con...)

❖ Clinical features:

- Ear discharge.
- Retroorbital pain and reduce corneal sensitivity.



- Lateral rectus palsy.



❖ Because of close relationship between ophthalmic division of trigeminal nerve and abducens nerve to petrous apex.

Petrositis (con...)

- ❖ High incidence of intracranial extension.
- ❖ Antibiotics and surgical drainage of petrous are the treatment of choice.

Facial nerve paralysis

- ❖ Result of either acute or chronic OM.
- ❖ Two mechanisms by which OM can result in facial nerve paralysis:
 1. Locally produced bacterial toxin.
 2. Pressure applied to nerve by cholesteatoma or granulation tissue.
- ❖ Managed by **myringotomy with aspiration** of pus along with **antibiotic** therapy.



Suppurative labyrinthitis

- ❖ Direct bacterial invasion of inner ear, usually via round window.
- ❖ Present with sudden **sensorineural hearing loss, severe vertigo, nystagmus, nausea and vomiting.**
- ❖ Cochlear aqueduct provides direct communication between perilymph and cerebrospinal fluid, therefore there is a significant risk of developing meningitis.

Suppurative labyrinthitis (con...)

❖ Treatment:

- Antibiotics.
- Mastoidectomy for drainage.

Meningitis

- ❖ Acute otitis media is the most common cause of bacterial meningitis.
- ❖ Occur as result of **hematogenous** spread, **direct** extension from middle ear through bony dehiscence or through cochlear aqueduct via inner ear.
- ❖ Most common organisms responsible for otic meningitis are **S pneumoniae** and **H influenzae type B**.

Meningitis (con...)

❖ Symptoms and signs:

- Fever.
- Neck rigidity.
- Positive Kernig's sign.
- Photophobia.
- Headache.
- Fluctuating levels of consciousness.



Meningitis (con...)

❖ Investigations:

• CSF:

- Essential unless there is increase intracranial pressure.
- Pressure, white cells and protein are raised.
- Chloride and glucose are lowered.

- Brain MRI to rule out other intracranial complications.

Meningitis (con...)

❖ Treatment:

- **Myringotomy** should be performed once antibiotic therapy initiated.
- Mastoidectomy is necessary if meningitis results from mastoiditis.

Brain abscess (con...)

- ❖ Orogenic brain abscess occur in cerebellum or in temporal lobe of cerebrum.
- ❖ Infection reach the brain by direct spread via bone and meninges or via blood vessels.
- ❖ Progression of symptoms can be gradual, occurring over days or even weeks.
- ❖ Symptoms:
 - Fever and malaise.
 - Headache, drowsiness, confusion, impaired consciousness and papilloedema.

Brain abscess (con...)

❖ Signs:

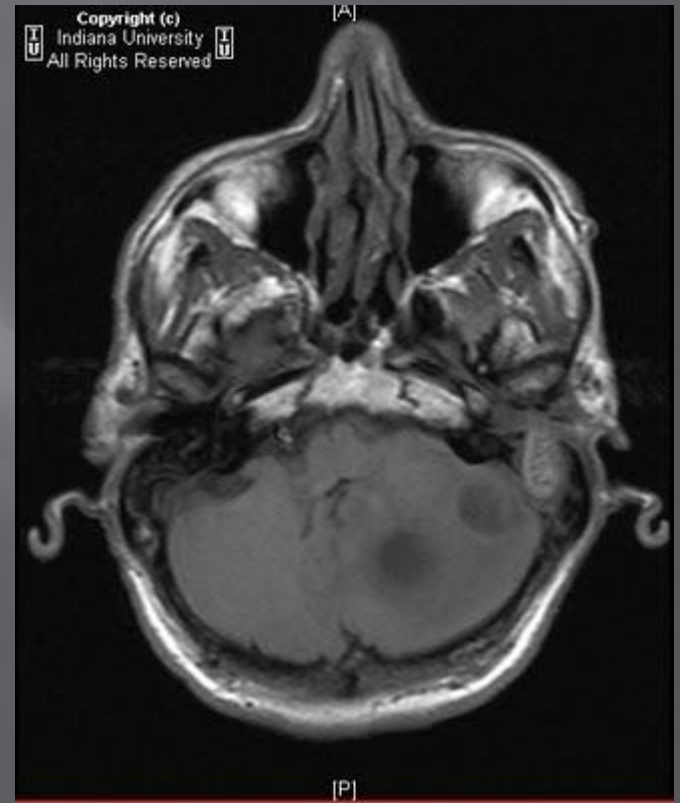
• Temporal lobe abscess:

- Dysphasia.
- Paralysis of contralateral face and arm.
- Hallucination of taste and smell.

• Cerebellar abscess:

- Neck stiffness.
- Weakness and loss of tone on same side.
- Ataxia.
- Intention tremor.
- Nystagmus.
- Vertigo.

Brain abscess (con...)



Brain abscess (con...)

❖ Treatment:

- Drained through a burr hole or excised via a craniotomy, if the patient's condition permits, mastoidectomy should be performed under same anesthetic.

❖ Prognosis:

- High mortality rate.
- Better for cerebral abscess than for cerebellar abscess.

Subdural abscess

- ❖ Forms between dura matter and arachnoid mater.
- ❖ Occurs in frontal region form sinusitis, but may result from ear disease.
- ❖ Symptoms and signs tend to progress more than those seen with brain abscess.
- ❖ Drainage of abscess is the mainstay of treatment.

Subdural abscess (con...)

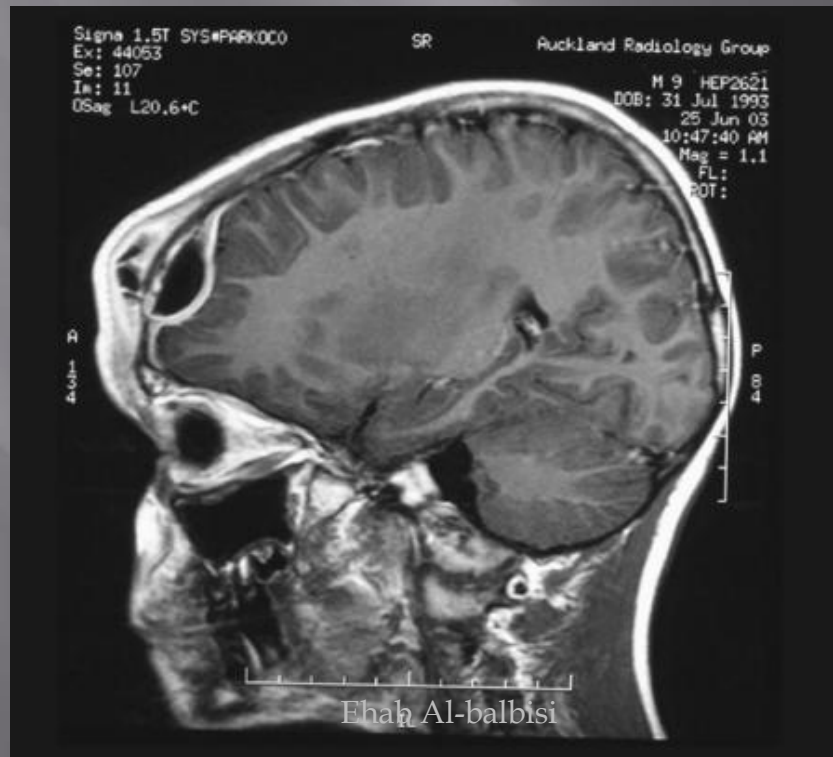


Extradural abscess

- ❖ Formed in middle fossa between **dura** matter and thin **bony plate of tegmen**.
- ❖ They also occur in posterior fossa, where they are commonly associated with lateral sinus thrombosis.
- ❖ Clinical features are nonspecific and may fluctuate if a dehiscence in tegmen is present, allowing abscess to partially drain into mastoid cavity.

Extradural abscess (con...)

❖ Because of its location, extradural abscess can be drained through mastoidectomy approach while treating the underlying middle ear disease.

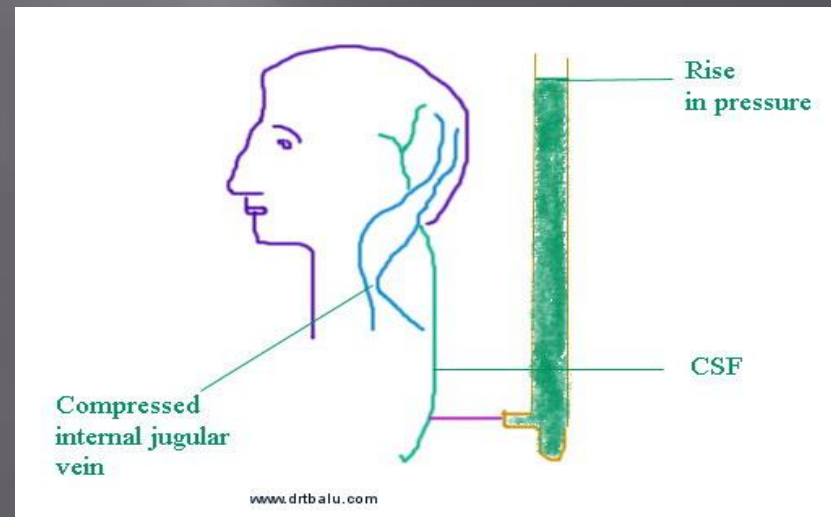
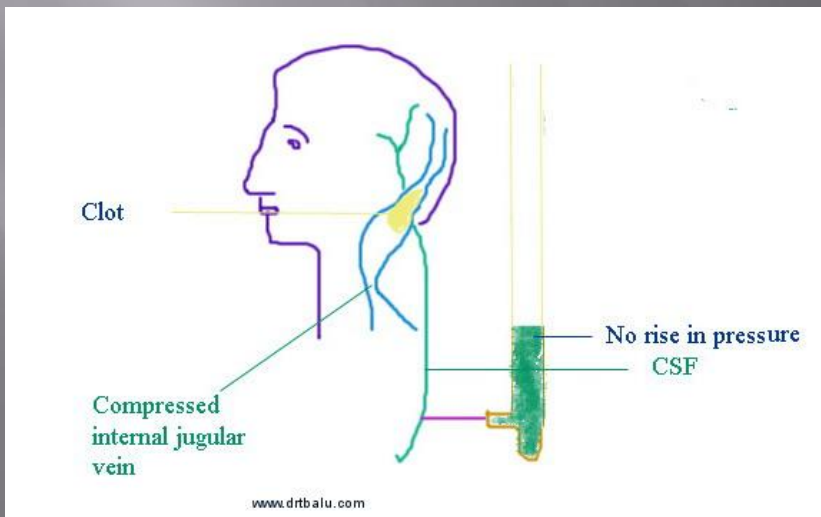


Lateral sinus thrombosis

- ❖ Because of its close **proximity to mastoid air cells**, the lateral sinus is prone to involvement in middle ear infections, which may lead to thrombosis.
- ❖ Once infected thrombus has formed, it may propagate distally and proximally and give rise to infected emboli.
- ❖ Clinical features:
 - Fever and rigor.
 - If thrombus propagates into **neck**, there will be neck tenderness along internal jugular vein, and neck stiffness.
 - Extension of thrombus to **sagittal sinus** can result in symptoms and signs of raised intracranial pressure.

Lateral sinus thrombosis (con...)

- Positive Tobey-Ayer test:
 - Compression of contralateral internal jugular vein leads to raise in CSF pressure.



Lateral sinus thrombosis (con...)

- ❖ **MRI** most reliably makes the diagnosis of lateral sinus thrombosis.
- ❖ The management requires **broad-spectrum antibiotics** and **complete mastoidectomy with exposure of lateral sinus**.
- ❖ Once the diagnosis confirmed by needle aspiration, the sinus is opened and infected thrombus evacuated.

Otic hydrocephalus

- ❖ Rare.
- ❖ Increase intracranial pressure (pathophysiology is poorly understood).
- ❖ The usual features are headache, vomiting, disturbed mental state, visual disturbance and papilledema.
- ❖ Imaging of brain reveals ventricular size to be **normal**.

Otic hydrocephalus (con...)

- ❖ Lumbar puncture confirms raised cerebrospinal fluid pressure.
- ❖ Resolving the middle ear infection and normalizing intracranial pressure with use of **steroids** and **diuretics (mannitol)**.