Complications of AOM

This teaching presentation for the ISOM website has been prepared by

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Acknowledgement

- This presentation is aimed for teaching purposes of students, residents and other allied healthcare workers
- Please visit the International Society for Otitis Media website for more resources, www.otitismediasociety.org

What are the Complications of OM?

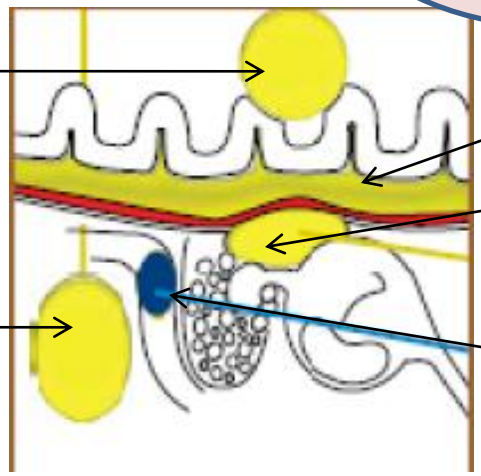
Complications of AOM

Extracranial intratemporal

- Acute mastoiditis
- Petrositis
- Labyrinthitis
- Facial paralysis
- Mastoid abscess

Intracranial

- Extradural abscess
- Subdural abscess
- Brain abscess
- Meningitis
- Lateral sinus thrombophlebitis



What intratemporal bone complications do you know ?

How does each complication present ?

How do you manage each complication ?

1. Acute coalescent mastoiditis

Definition

It is the inflammation of mucosal lining of antrum and mastoid air cells system.

Mastoiditis, per se, actually occurs with most infections of the middle ear. It is not considered a complication until bone destruction occurs.

Pathophysiology of acute mastoiditis

- Production of pus under tension
- Hyperemic decalcification
- Osteoclastic resorption of bony walls

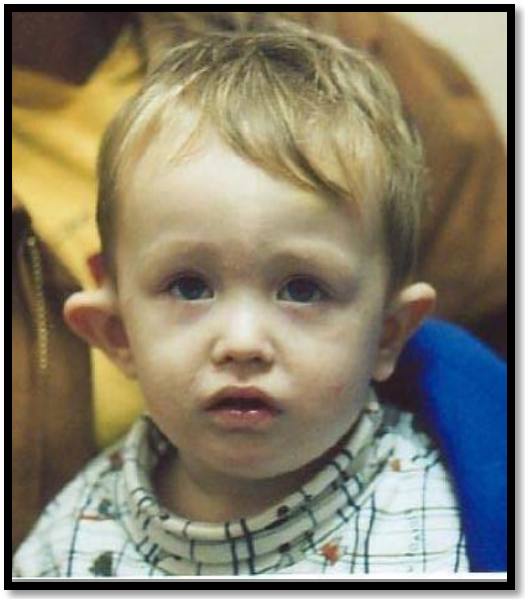
Clinical Features of acute mastoiditis

Symptoms

- Earache
- Fever
- Ear discharge (otorrhea) (not always present)

Signs

- Mastoid tenderness
- Sagging of postero-superior meatal wall
- Eardrum perforation (not always present)
- Swelling, redness and bulging over the mastoid
- Hearing loss (conductive)



Investigations for acute mastoiditis

- Ear swab for culture & sensitivity (C&S)
- HRCT scan of the temporal bone as well as CT scan of brain with contrast
- Myringotomy with pus C&S
- Blood cultures, if indicated

Treatment of acute mastoiditis

Medical treatment:

- Hospitalization
- Intravenous antibiotics
- Analgesics

Surgical treatment:

- Myringotomy with or without ventilation tube insertion may be sufficient in most
- Cortical mastoidectomy if clinical worsening occurs

2. Acute labyrinthitis

Acute inflammation of the labyrinth due to diffusion of toxins via the round window from the middle ear or due to a labyrinthine fistula caused by hyperemic decalcification.

Acute labyrinthitis

Clinical Picture

- Hearing loss progressive and sensorineural or mixed in nature
- Attack of vertigo and vomiting mostly during straining, sneezing and lifting heavy object
- Positive fistula test
- Nystagmus may be present to the side of the affected ear

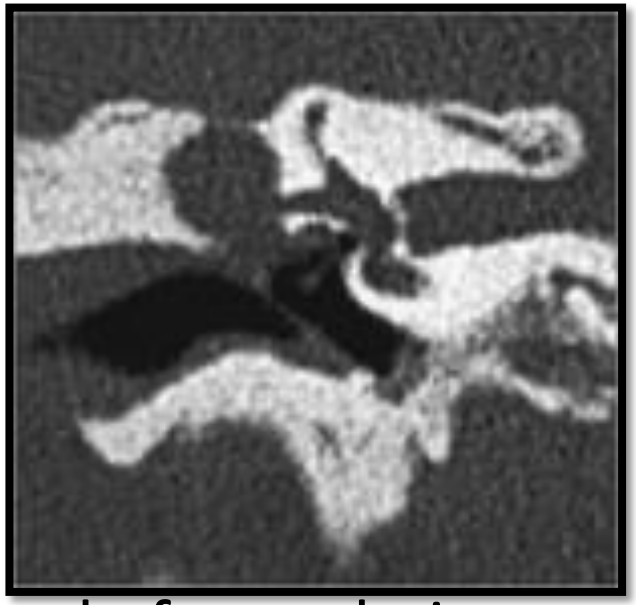
Acute labyrinthitis

Diagnosis

- High index of suspicion
- Positive fistula test
- HRCT scan of temporal

bone will demonstrate fistula,

if present



Treatment :

High dose IV antibiotics

Cortical mastoidectomy with removal of granulations and closure of fistula, if present

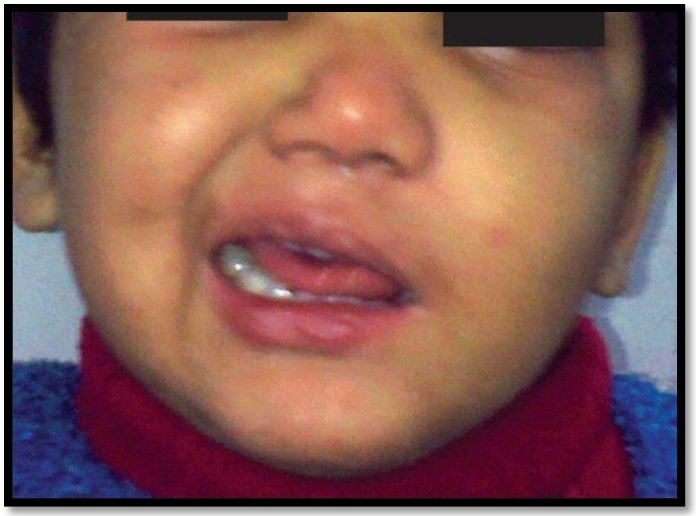
Acute facial nerve paresis/paralysis

- A result of an inflammatory response of the facial nerve within the fallopian canal to the infection.
- The tympanic segment is the most common site to be involved as the facial canal may have dehiscences along this segment

Diagnosis of Facial nerve paralysis

- Clinical : House Brackmann grade must be established and monitoring for progression and recovery made
- HRCT of the temporal bone

performed to look for bone erosion



Treatment of acute facial nerve paralysis

- Intravenous antibiotics
- Cortical mastoidectomy + ventilation tube insertion
- Excision of granulations over dehiscent facial canal and decompression of the nerve

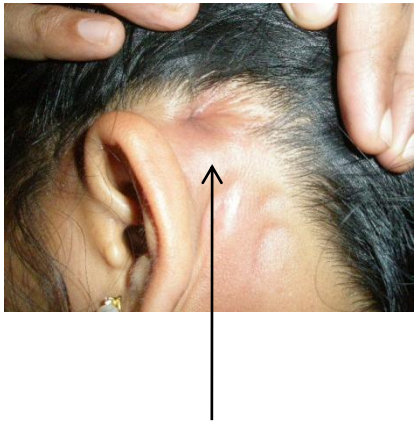
Extracranial Complications: Mastoid abscess -clinical

- Classically, a **postaural abscess** occurs
- When the abscess spreads along the mastoid air cell system, other sites of collection occur eg:
- **Bezold's abscess**: abscess over upper part of sternomastoid muscle
- **Luc's abscess**: abscess

over root of zygoma

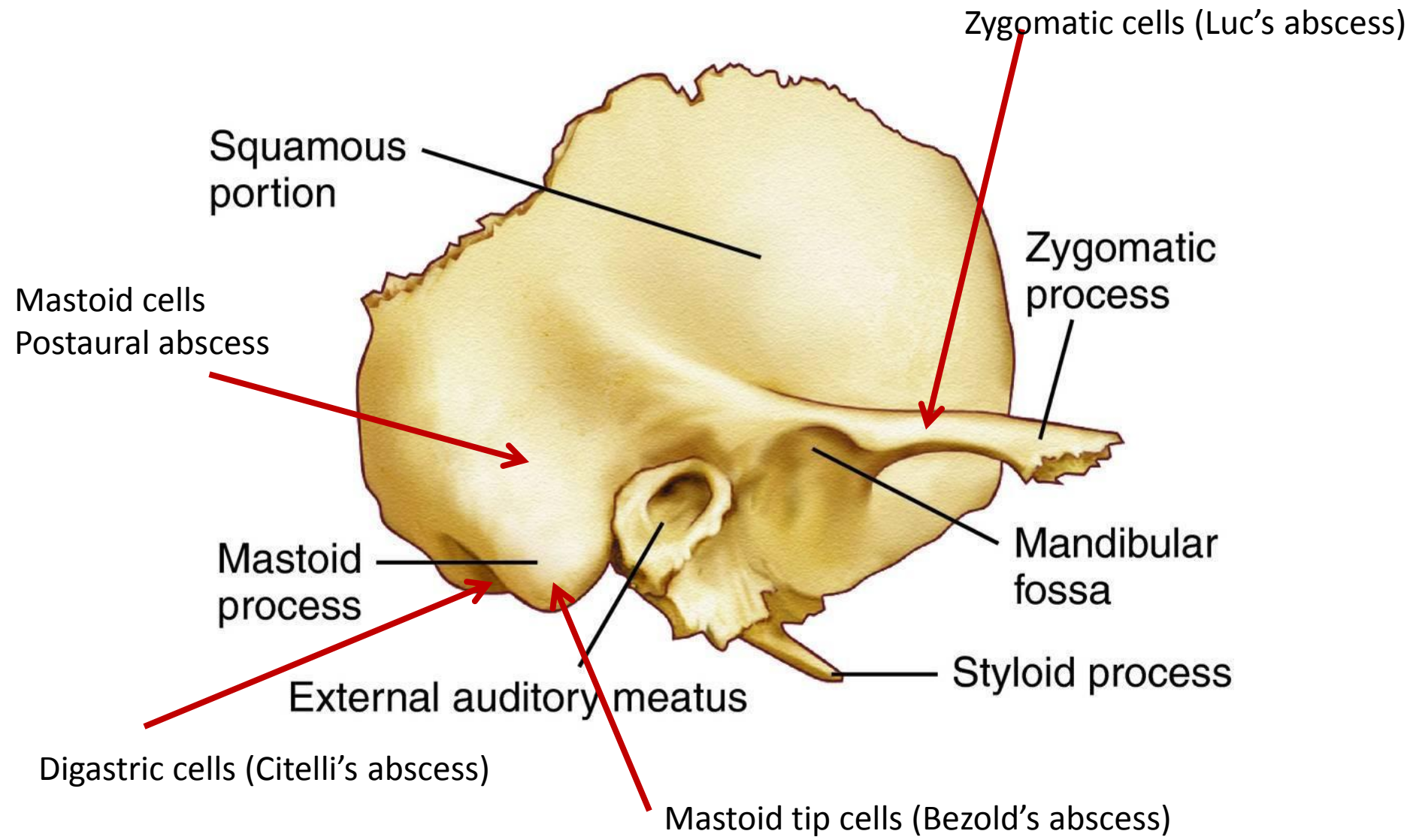
- **Citelli's abscess**: abscess

over posterior belly of digastric



Postaural abscess

Sites of pneumatisation of mastoid air cell system in relation to types of mastoid abscess



Extracranial Complications: Mastoid abscess -treatment

- Aspiration or drainage of abscess and pus sent for C&S
- IV antibiotics
- Cortical mastoidectomy may be required after 24-48 hours if symptoms persist

Intracranial Complications

- What are intracranial complications ?
- What is the most common intracranial complication ?
- Which symptoms do patients presenting with intracranial complications exhibit ?
- What are the investigations required to diagnose such complications ?

Important tenets

- Intracranial complications should be suspected in a child with recent onset of headache, fever, convulsions,vomiting, not feeding well or focal neurological deficit

- Contrast enhanced CT scan of the brain is mandatory prior to lumbar puncture when intracranial complication is suspected to avoid “coning” (brain herniation into foramen magnum which causes death)

Intracranial Complications: Extradural Abscess

Definition:

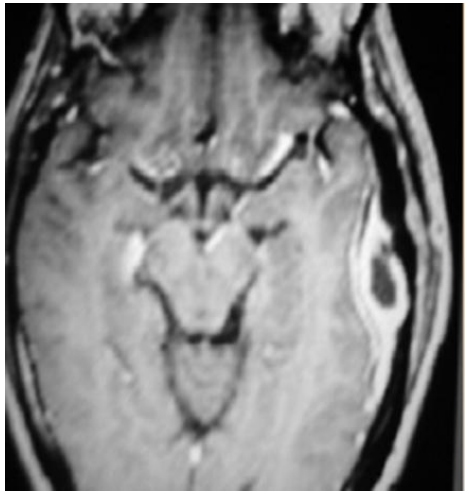
- Collection of pus against the dura of the middle or posterior cranial fossa.
- Extradural abscess is the commonest intracranial complication of otitis media.

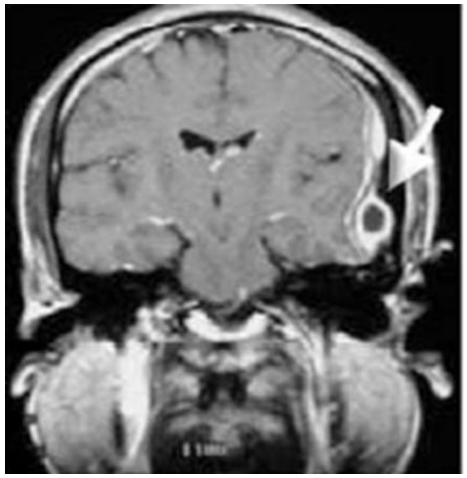
Intracranial Complications: Extradural abscess – clinical & treatment

Clinical Picture
– Persistent headache on the side of otitis media
– Pulsating discharge
– Fever
– May be asymptomatic (discovered during surgery)

Diagnosis:
– CT scans reveal the abscess as well as the middle ear pathology.
- MRI reveals associated dural inflammation.

Treatment:
– Mastoidectomy and drainage of the abscess.





Intra-cranial Complications: Subdural Abscess- clinical

Definition

– Collection of pus between the dura and the arachnoid.

– A rare pathology

Clinical picture:

– Headache without signs of meningeal irritation

– Convulsions

– Focal neurological deficit (paralysis, loss of sensation, visual field defects)

Intracranial Complications: Subdural Abscess-Investigation and treatment

Investigations

– CT scan

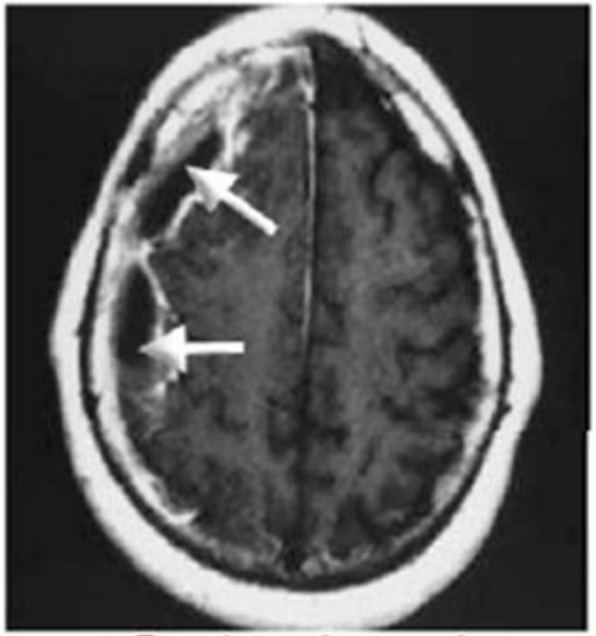
- MRI

Treatment:

– Drainage or excision (neuro-surgical consultation required)

– High dose IV antibiotics

– Mastoidectomy



Sub-dural Absecss

Intracranial Complications: Meningitis -pathology

Definition

– Inflammation of the meninges (pia, arachnoid and dura)

Pathology

– Two forms

- Circumscribed meningitis: no bacteria in CSF.
- Generalized meningitis: bacteria are present in CSF

Intracranial Complications: Meningitis -clinical

Clinical picture:

– **General symptoms and signs:**

- High grade remittent fever, restlessness, irritability,
- Photophobia, and delirium.
- Instability

Intracranial Complications: Meningitis -signs of meningeal irritation

Signs of meningeal irritation:

- Nuchal rigidity
- **Positive Kernig's sign:** difficulty to straighten the knee while the hip is flexed
- **Positive Brudzinski's sign:**

– passive flexion of one leg results in a similar movement on the opposite side or

– if the neck is passively flexed, flexion occurs in the hips and knees

Intracranial Complications: Meningitis - diagnosis and treatment

Diagnosis

- Lumbar puncture is diagnostic

Treatment:

- High dose IV antibiotics.
- Antipyretics and supportive measures.
- Mastoidectomy to control the ear infection after general condition improves

Intracranial Complications: Lateral Sinus Thrombosis- etiology

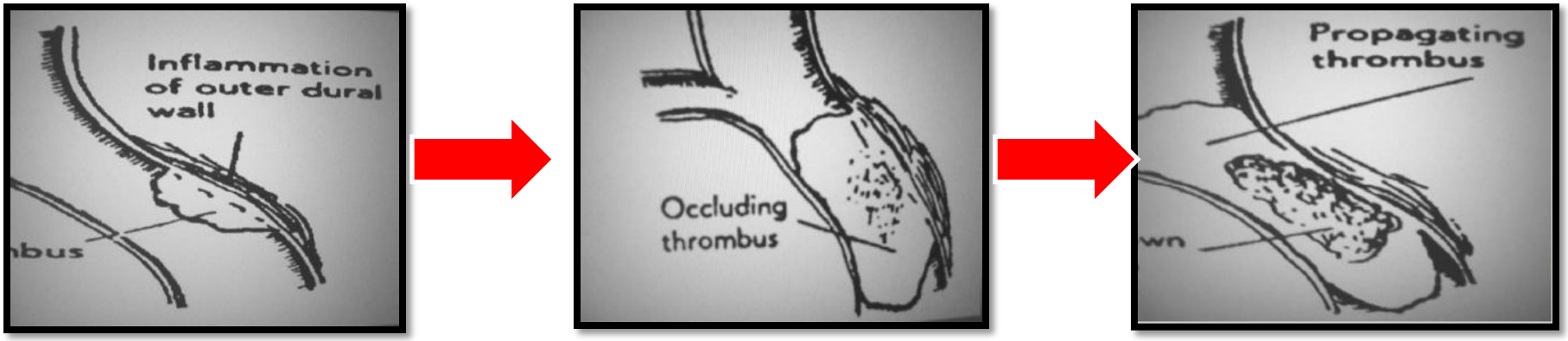
Definition

- Thrombophlebitis of the lateral and sigmoid venous sinus; most often in the sigmoid sinus.

Etiology

- It usually develops secondary to direct extension from a perisinus abscess due to an advanced otitis media.

Lateral sinus thrombosis: pathogenesis



Stage 1 **Stage 2** **Stage 3**

Intracranial Complications: Lateral Sinus Thrombosis-clinical

Signs of blood invasion:

- Fever (spiking) with rigors and chills or persistent fever(septicemia).

– Positive **Greisinger's sign** which is edema and tenderness over the area of the mastoid emissary vein.

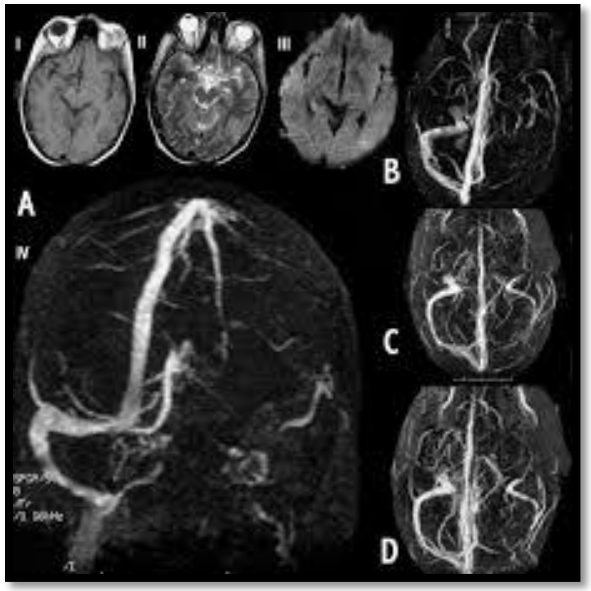
Signs of increased intracranial pressure:

Headache, vomiting, and papilledema.

When the clot extends to the jugular vein, the vein might be felt in the neck as a **tender cord.**

Intracranial Complications: Lateral Sinus Thrombosis-diagnosis

- CT scan with contrast, “delta” sign.
- MRI, MRangiography, MR venography
- Angiography, venography.
- Blood cultures is positive during the febrile phase.



MR venography showing obstructed sigmoid sinus on the right side and good venous filling on the left

Intracranial Complications: Lateral Sinus Thrombosis- treatment

Treatment

Medical:

- High dose IV antibiotics and supportive treatment
- Anticoagulants

Surgical:

- Mastoidectomy with exposure of the affected sinus and the intra-sinus abscess is drained.

Intracranial Complications: Brain Abscess

Definition

- Localized suppuration in the brain substance.
- It is most lethal complication of suppurative otitis media.

Incidence:

- 50% otogenic brain abscess.
- It is more common in males, especially between 10 – 30 years of age.

Intracranial Complications: Brain Abscess- pathology and diagnosis

Pathology

- Site: Temporal lobe, or less frequently, in the cerebellum

Diagnosis

- Contrast enhanced

CT scan of the brain

- Contrast MRI brain

Intracranial Complications: Brain Abscess-treatment

Medical:

- Broad-spectrum antibiotics.
- Measures to decrease intracranial pressure.

Surgical:

- Neurosurgical drainage or excision of the abscess .
- Mastoidectomy operation after subsidence of the acute stage.