

Complications of Suppurative Otitis Media

Ahmed Omran, MD
Lecturer of ORL Department
Alex - University



Complications of Suppurative OM

★ **Predisposing factors:**

- Virulent organisms.
- Cholesteatoma and bone erosion.
- Presence of a congenital dehiscence (e.g. dehiscence facial canal) or a preformed pathway (e.g. skull base fracture).
- Obstruction of drainage e.g. by a polyp.
- Low resistance of the patient.



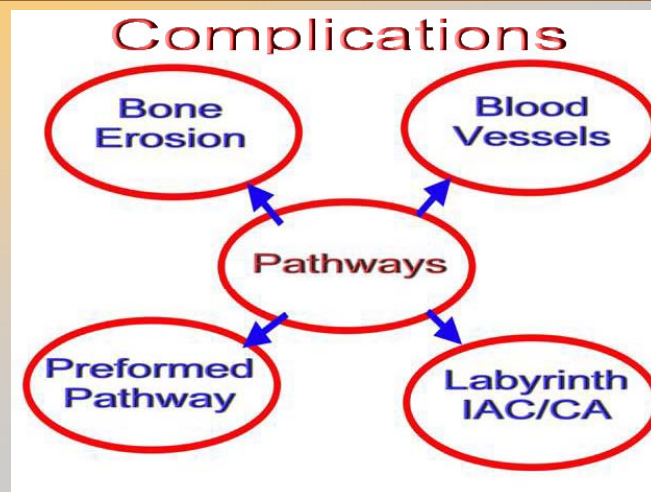
Complications of Suppurative OM

★ Pathways of infection:

- The commonest way for extension of infection is by **bone erosion** due to a cholesteatoma.
- **Vascular extension** (retrograde thrombophlebitis).
- Extension along **preformed pathways** as
 - Congenital dehiscences, fracture lines, round window membrane, the labyrinth,
 - Dehiscences due to previous surgery.



Complications of Suppurative OM





Complications of Suppurative OM



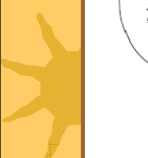
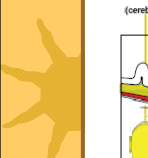


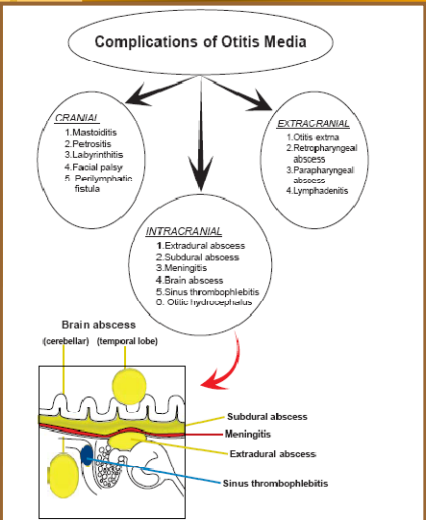
★ **Classification:**

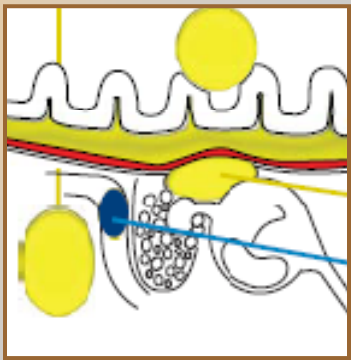
- ***Cranial complications***
- ***Intra-cranial complications***
- ***Extra-cranial complications***



Complications of Suppurative OM

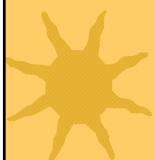
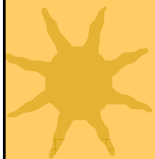
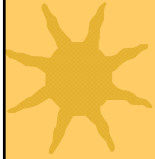










Complications of Suppurative OM



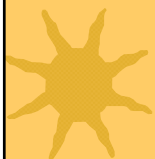
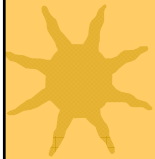
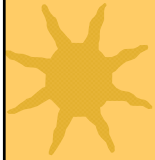
★ **Classification:**

- ***Cranial complications***

- Acute mastoiditis and mastoid abscesses (most common complication).
- Petrositis.
- Labyrinthitis.
- Facial paralysis.
- Osteomyelitis of the temporal bone



Complications of Suppurative OM



★ **Classification:**

- ***Intra-cranial complications***

- Extradural abscess (commonest intracranial complication).
- Subdural abscess.
- Meningitis.
- Brain abscess:
 - Temporal lobe abscess.
 - Cerebellar abscess.
- Lateral sinus thrombosis.
- Otitic hydrocephalus.



Complications of Suppurative OM





★ **Classification:**

- ***Extra-cranial complications***
 - External otitis.
 - Cervical lymphadenitis
 - Retropharyngeal and
 - Parapharyngeal abscesses



Intracranial Complications of Suppurative OM





1. Meningese

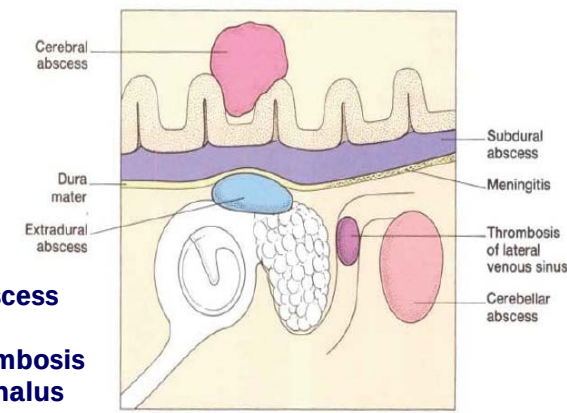
- EDA
- SDA
- Meningitis

2. Brain

- Temp Abscess
- Cerebellar Abscess

3. Vesseles

- Lat sinus thrombosis
- Otitic hydrocephalus





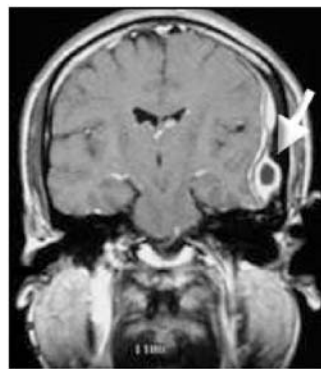
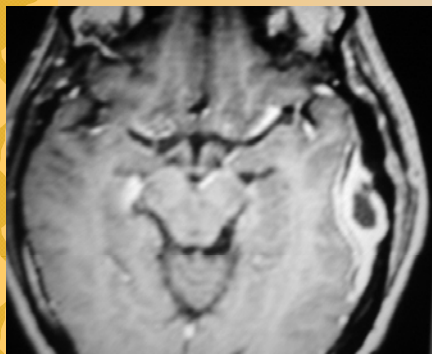
Extradural Abscess

★ Definition:

- Collection of pus against the dura of the middle or posterior cranial fossa.
- When pus collects against the walls of the lateral sinus, it is called **perisinus abscess**.
- Extradural abscess is the **commonest** intracranial complication of otitis media.



Extradural Abscess



Extra-dural
Abscess



Extradural Abscess

★ **Clinical Picture:**

- Persistent headache on the side of otitis media.
- Pulsating discharge.
- Fever
- Asymptomatic (discovered during surgery)

★ **Diagnosis:**

- CT scans reveal the abscess as well as the middle ear pathology.

★ **Treatment:**

- Mastoidectomy and drainage of the abscess.



Subdural Abscess

★ **Definition:**

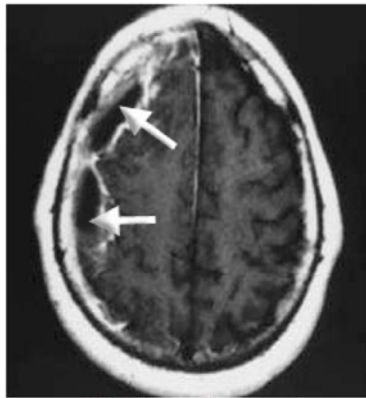
- Collection of pus between the dura and the arachnoid.
- It's a rare pathology

★ **Clinical picture:**

- Headache without signs of meningeal irritation
- Convulsions
- Focal neurological deficit (paralysis, loss of sensation, visual field defects)



Subdural Abscess



Sub-dural
Abscess



Subdural Abscess

★ **Investigations:**

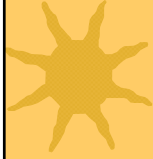
- CT scan, MRI

★ **Treatment:**

- Drainage (neurosurgeons)
- Systemic antibiotics
- Mastoidectomy

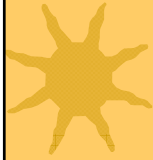


Leptomeningitis



★ **Definition:**

- Inflammation of leptomeninges (pia & arachinoid)

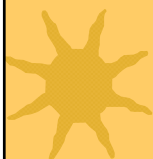


★ **Pathology:**

- Occurs during acute exacerbation of chronic unsafe middle ear infection.
- Type III pneumococcus infection.
- Two forms:
 - **Circumscribed meningitis:** no bacteria in CSF.
 - **Generalized meningitis:** bacteria are present in CSF

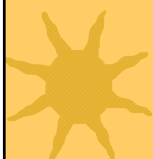
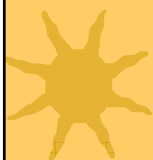


Leptomeningitis



★ **Pathological stages of generalized meningitis :**

- **Serous stage:** characterized by outpouring of fluid and **increased CSF pressure**.
- **Cellular stage:** characterized by **increase number of cells** especially **lymphocytes**.
- **Bacterial stage:** **bacteria and polymorphonuclear leucocytes** are present in large numbers.





Leptomeningitis

★ Clinical picture:

– General symptoms and signs:

- high fever, restlessness, irritability,
- photophobia, and delirium.

– Signs of meningeal irritation:

- Neck 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



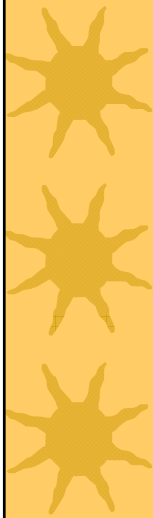
Leptomeningitis



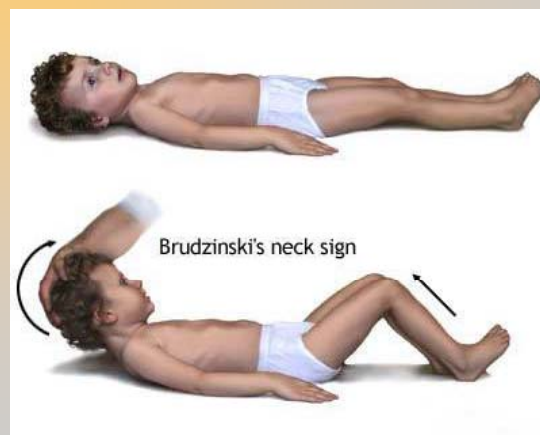
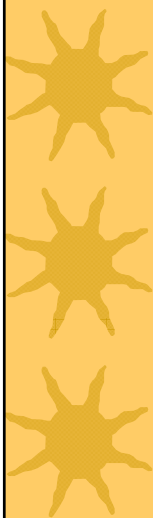
Neck Stiffness in Meningitis



Leptomeningitis

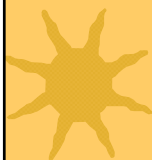
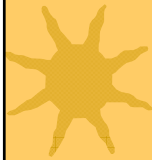
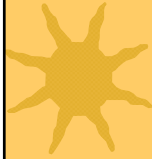


Leptomeningitis





Leptomeningitis



★ Clinical picture:

– Signs of increased intracranial pressure:

- severe headache,
- vomiting and
- papilledema.

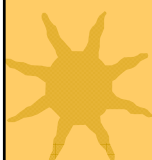
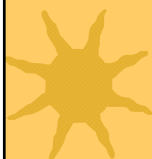


– Terminal stage:

- the delirium progresses to coma,
- the reflexes become weak or absent,
- cranial nerve palsies occur.



Leptomeningitis



★ Diagnosis:

– Lumbar puncture is diagnostic:

- CSF is cloudy and
- CSF pressure is increased.
- Contains bacteria and many polymorphs.
- Protein concentration is raised but
- Glucose and chlorides are decreased.

★ Treatment:

- Treatment of the complication itself and control of ear infection:
 - Specific antibiotics.
 - Antipyretics and supportive measures
 - Mastoidectomy to control the ear infection.



Leptomeningitis



Lateral Sinus Thrombosis

★ **Definition:**

Thrombophlebitis of the lateral venous sinus.

★ **Etiology:**

It usually develops secondary to direct extension from a perisinus abscess due to unsafe otitis media with cholesteatoma.



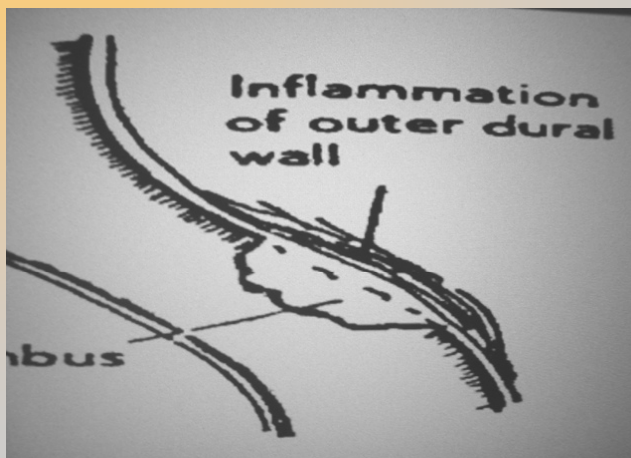
Lateral Sinus Thrombosis

★ **Pathology:**

- ★ Inflammation of the walls of the sinus causes the formation of a mural thrombus which obstructs the lumen of the sinus.
- ★ Then become infected → intra-sinus abscess.
- ★ Infected emboli are shed from the infected thrombus causing pyemia.
- ★ When the organisms reach the blood stream septicemia develops.
- ★ Progression of infection may lead to
 - cavernous sinus thrombosis or
 - cerebellar brain abscess.

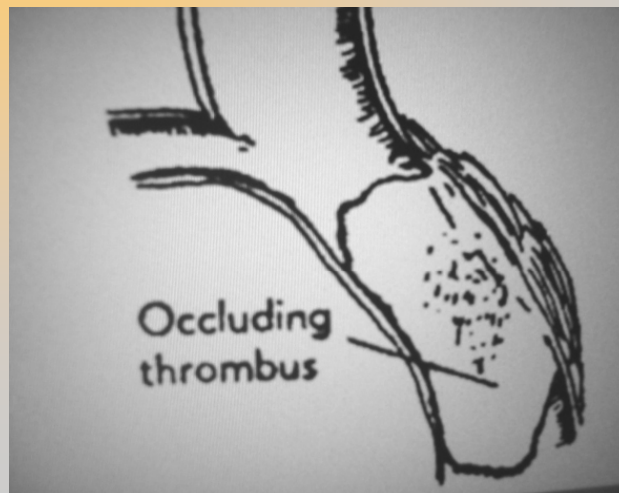
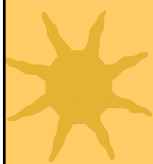
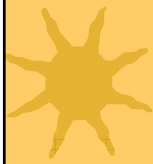
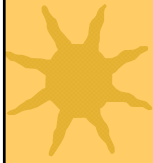


Lateral Sinus Thrombosis

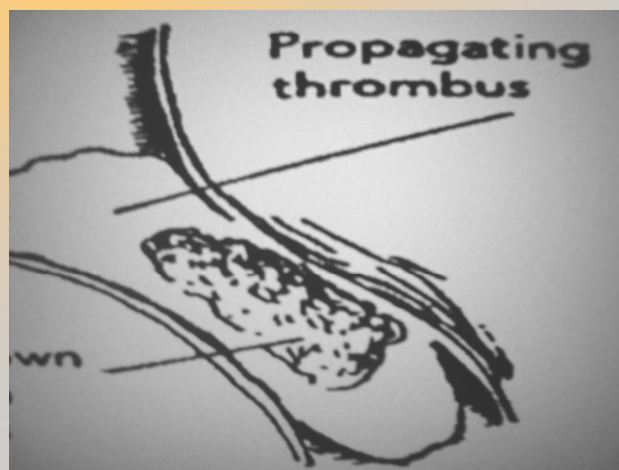
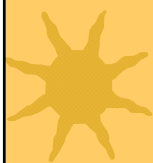
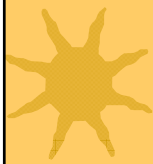
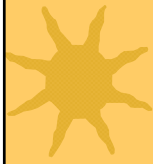




Lateral Sinus Thrombosis

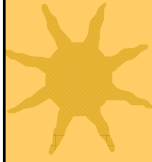
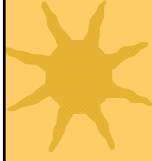


Lateral Sinus Thrombosis





Lateral Sinus Thrombosis



★ Clinical picture:

– Signs of blood invasion:

- **hectic (spiking) fever** with rigors and chills due to the showers of septic emboli. D.D: malaria.
- **persistent fever** (septicemia).

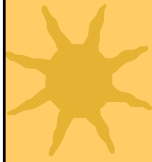
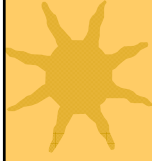
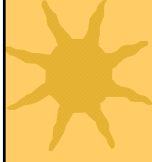
- Positive **Greissinger's sign** which is edema and tenderness over the area of the mastoid emissary vein.

- **Signs of increased intracranial pressure:** headache, vomiting, and papilledema.

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



Lateral Sinus Thrombosis



★ Diagnosis:

- CT scan with contrast

- MRI, MRA, MRV

- Angiography, venography

- **Tobey-Ayer test: {Quekentedt's test}**

- Pressure on the internal jugular vein on the healthy side causes elevation of CSF pressure
- pressure on the vein on the diseased side has not effect on CSF pressure.

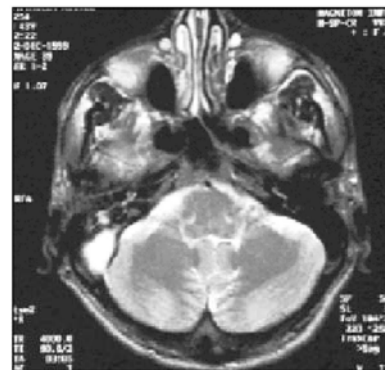
- Blood cultures is positive during the febrile phase.



Lateral Sinus Thrombosis



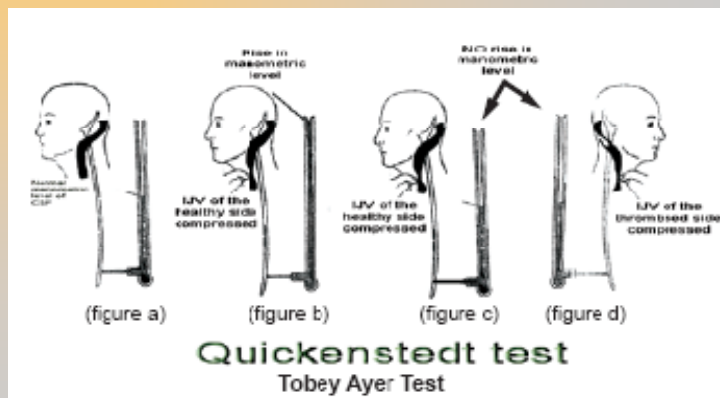
Lateral Sinus Thrombophlebitis (CT)



Lateral Sinus Thrombophlebitis (MRI)

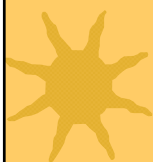
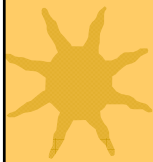
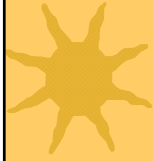


Lateral Sinus Thrombosis





Lateral Sinus Thrombosis



★ Treatment:

– Medical:

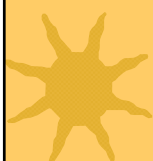
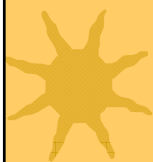
- Antibiotics and supportive treatment.
- Anticoagulants

– Surgical:

- Mastoidectomy with exposure of the affected sinus and the intra-sinus abscess is drained.
- Ligation of the internal jugular vein distal to the facial vein is indicated in recurrent embolism.



Brain Abscess



★ Definition:

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

★ Incidence:

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



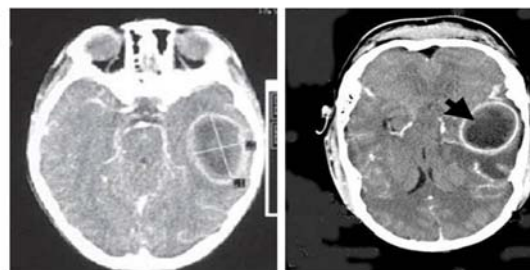
Brain Abscess

★ Pathology:

- Site:
 - Temporal lobe or
 - Less frequently, in the cerebellum. (more dangerous)
- 4 stages:
 - Stage of encephalitis: brain tissue inflammation
 - Stage of localization (latent stage): small cavities filled with pus
 - Stage of acute abscess (Manifest stage)
 - **Rupture spontaneously**
 - **Compress other brain centers**
 - Stage of chronic abscess:
 - **Stationary, low virulent organism, thick wall**



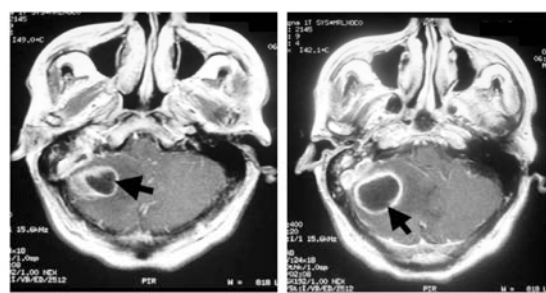
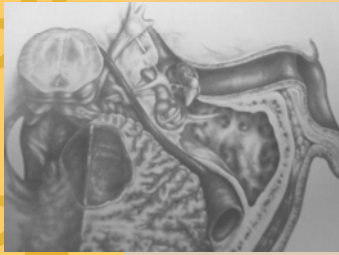
Brain Abscess



Cerebral Abscess



Brain Abscess



Cerebellar Abscess



Brain Abscess

★ Clinical picture:

1. Stage of invasion (encephalitis):

- fever, headache, delirium, and
- Signs of meningeal irritation.

2. Latent stage (stage of localization):

- Minimum symptoms ,mild headache
- The patient may be lethargic & irritable.



Brain Abscess

★ Clinical picture:

3. Manifest stage (acute abscess):

- **Symptoms and signs of increased intracranial pressure:**
 - Severe headache.
 - Projectile vomiting (no nausea).
 - Papilledema.
- **Characteristic signs and symptoms of brain abscess:**
 - Marked toxemia and loss of appetite.
 - Slow pulse.
 - Subnormal temperature.
 - Delirium and lethargy.



Brain Abscess

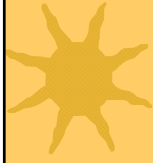
★ Clinical picture:

3. Manifest stage (acute abscess):

- **Localizing signs:**
 - **Temporal lobe abscess:**
 - Aphasia (left-sided lesions of Brochias area)
 - Hemianopia (optic radiation).
 - Hemiplegia or hemiparesis. (motor area)
 - Uncinate: olfactory hallucinations.
 - **Cerebellar abscess:**
 - Homolateral hypotonia.
 - Ataxia
 - Intention tremors (finger-to-nose test).
 - Dysdiadochokinesis.
 - Positive Romberg's sign.



Brain Abscess



★ **Clinical picture:**

4. Terminal stage:

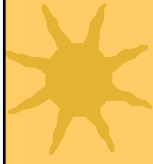
- Brain abscess unless treated usually ends by death either due to:
 - Coning of the brain stem into foramen magnum,
 - Rupture of the abscess.

5. Chronic abscess:

- Headache
- Mental changes

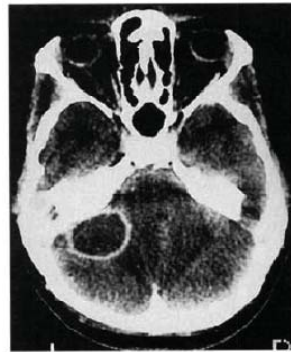


Brain Abscess



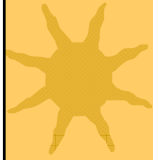
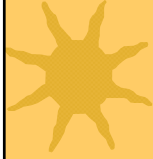
★ **Diagnosis:**

- CT scans.
- MRI





Brain Abscess



★ **Treatment:**

– **Medical:**

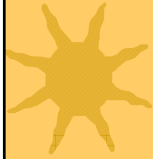
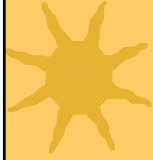
- Systemic antibiotics.
- Measure to decrease intracranial pressure.

– **Surgical:**

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



Otitic Hydrocephalus



★ **Definition:**

- Increased CSF volume in patients with CSOM due to **thrombosis of the superior sagittal sinus** interfering with the absorption of CSF.
- More common in children.

★ **Diagnosis:**

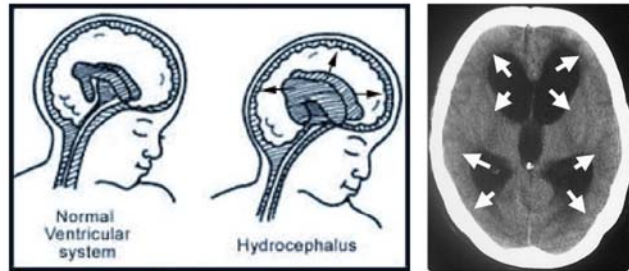
- Headache, projectile vomiting, and papilledema.
- Diplopia due to VI nerve palsy.
- Increased CSF pressure, otherwise CSF is normal.

★ **Treatment.**

- Reduction of CSF pressure (diuretics, lumbar puncture).
- Treatment of ear infection.
- Shunt operation.



Otitic Hydrocephalus



Otitic Hydrocephalus