# Practical Pathology


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# COMPENENTS

**9 Cases:**

1- Meningioma
2- Glioblastoma
3- MS
4- Schwannoma
5- Hydrocephalus
6- Pyogenic meningitis
7- cerebral abscess
8- Berry aneurysm
9- Alzheimer's disease

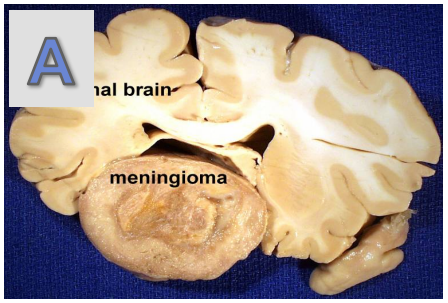
Color keys:

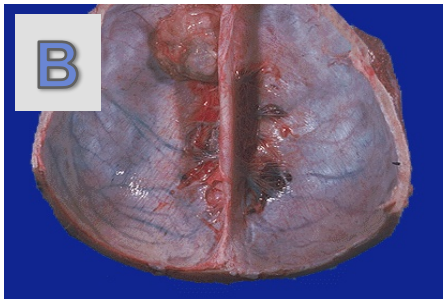
- In questions the underline words are the key points
- Which written in red color is important
- Which written in grey just to explain terms for you

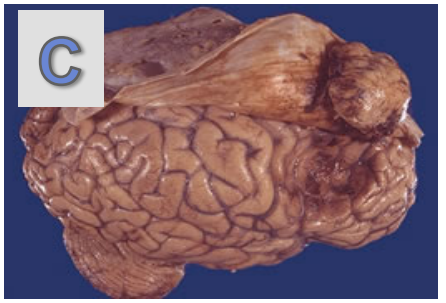
# CASE 1:

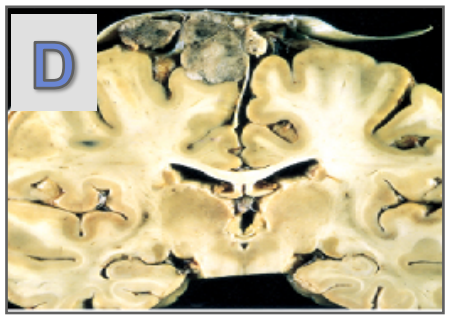
A 43- year old female complained of headache and two attacks of seizures in the past 4 months . Brain MRI revealed a 3 cm extra-axial mass (outside brain parenchyma ) in the parietal region. It was dural- based with mild edema in the surrounding brain tissue. What is your provisional diagnosis?

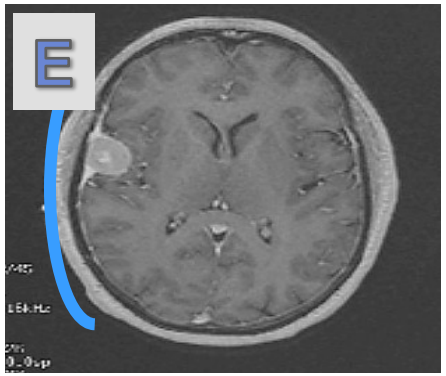
**Diagnosis: Meningioma**



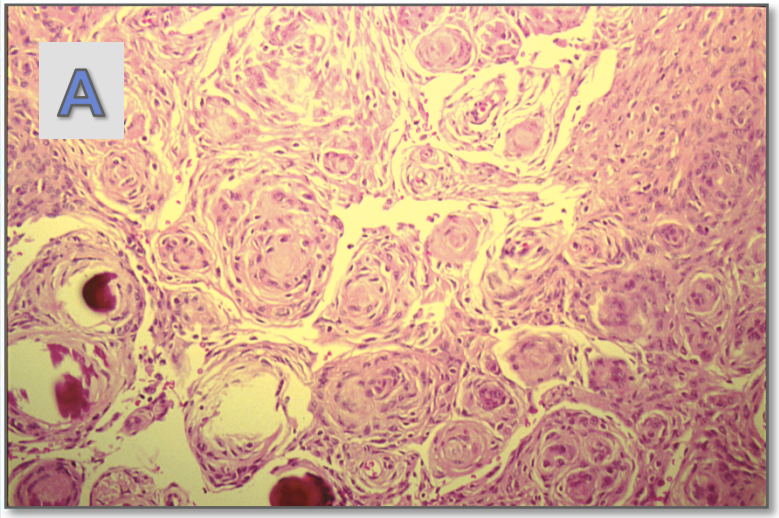

**Gross :**

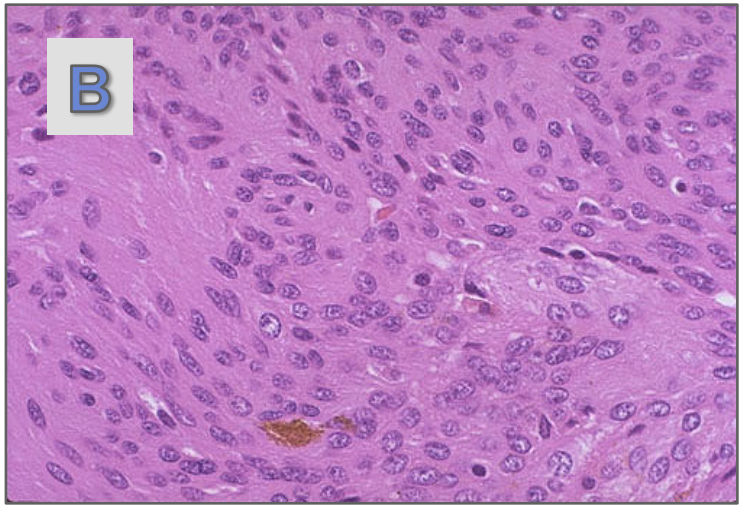
**A ,B &C:** Well defined **mass attached to base of dura** (sub dural) and **compresses brain parenchyma**.

**D:** Well defined mass compresses brain parenchyma **with multilobular.**

**E:** MRI shows well defined mass in lateral convexity compresses brain parenchyma.

# Diagnosis: Meningioma




**Microscopic :**

1- **Whorls pattern** ***of** fibrocellular tissue (fibres + Cells ).
2- tumor cells are oval, spindle shape or elongated and **lack mitosis**.
3- **Psommoma bodies** (spherical calcified particles).
4- Picture B shows **hemosiderin** (iron pigment).

whorls

- **Notes**

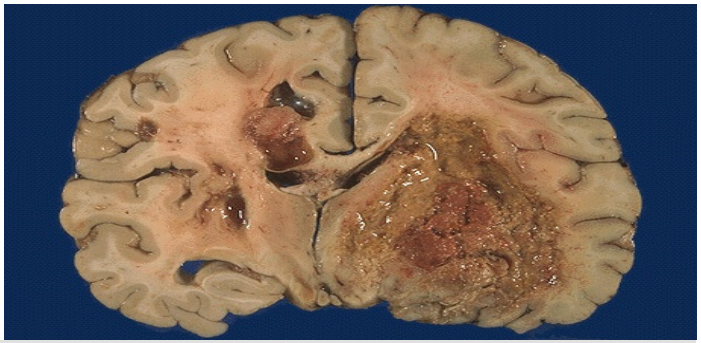
1. **Rarely, meningiomas can be more aggressive and invade**
2. **may reach a large size before symptoms lead to detection**

## CASE 2 :

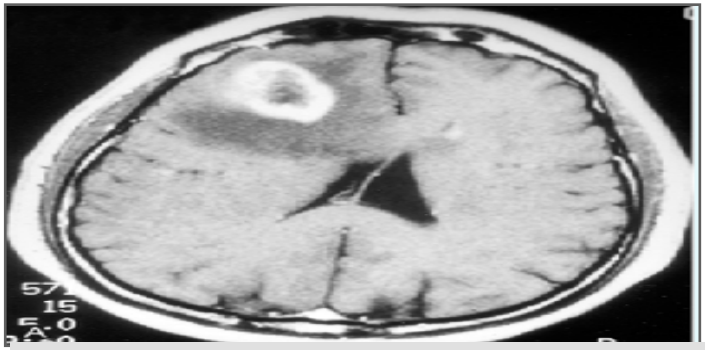
- A 55 years old man complained of headache for the last 2 months . Brain MRI reveals a 3 cm frontal intra - parenchymal space occupying lesion with rim enhancement * on contrast studies.What is your provisional diagnosis ?

**Diagnosis: multiform Glioblastoma**

### Gross:

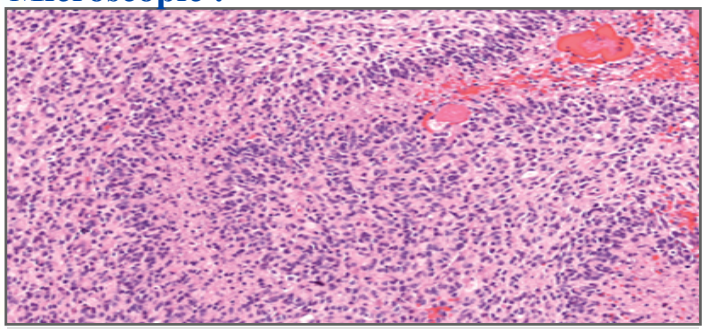


- **Irregular mass**
- **Hemorrhage** ( due to quite vascular )
- **necrosis**



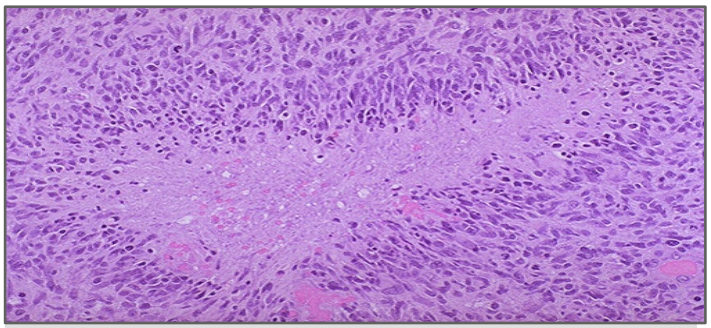
CT scan :
- peri-tumoral edema
- **Rim enhancement***

### Microscopic :



**Low Power Field Microscopy**

1- necrosis and hemorrhage .
2- pseudopalisading malignant cells. *
3- Endothelial proliferation.



**High Power Field Microscopy**

The same in LPF
4- cellularity
5- hyperchromatism
6- pleomorphism

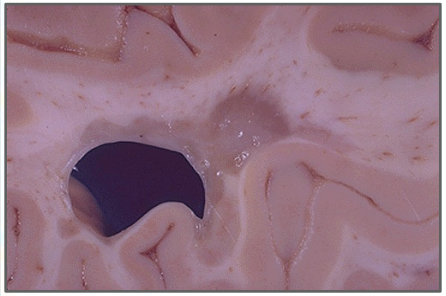
- Rim enhancement appears in MRI due to contrast dye and because this tumor is quitly vascular the dye reach richly to the tumor cells
- Pseudopalisading is the arrangement of the malignant cells around necrosis .

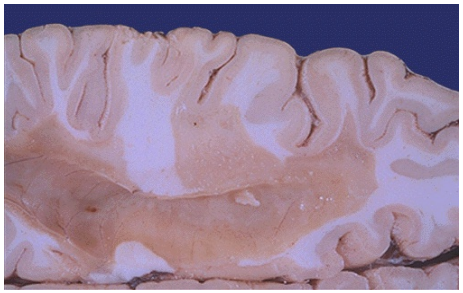
## CASE 3 :

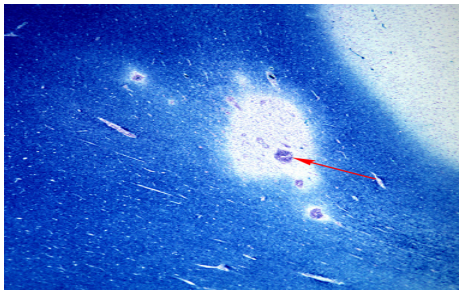
A 27 years old woman presents with a sudden onset of right sided blindness (earliest symptoms) and weakness in her left leg. There is no history of trauma. However, she experienced a similar episode 8 (relapse and remitting) months ago and was diagnosed as aseptic meningitis (inflammation without infection) .What is your provisional diagnosis?

**Diagnosis: Multiple sclerosis**

### Gross:



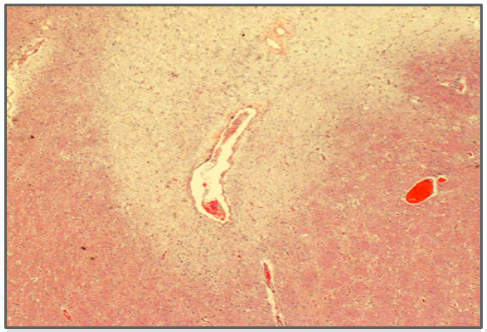




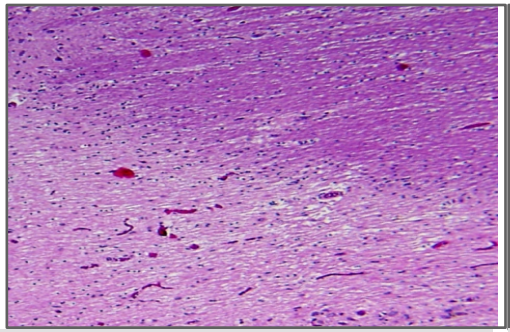
**Plaque lesion** (grey-tan appearance which is a large of demyelination at the white matter)

**(Luxol Fast Blue/PAS) stain lesion and inflammatory cells surrounded a vein (arrow).**

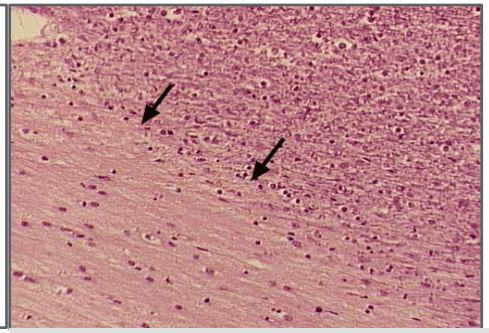
### Microscopic :



1- little mononuclear inflammation (lymphocytes, plasma cells and macrophages) around the vein
2- loss of myelin (is lighter pink than the normal white matter surrounding it)



Inactive demyelinated plaque



**older MS plaque charcters :**
the plaque
decrease in oligodendroglial nuclei
increase of astrocyte nuclei

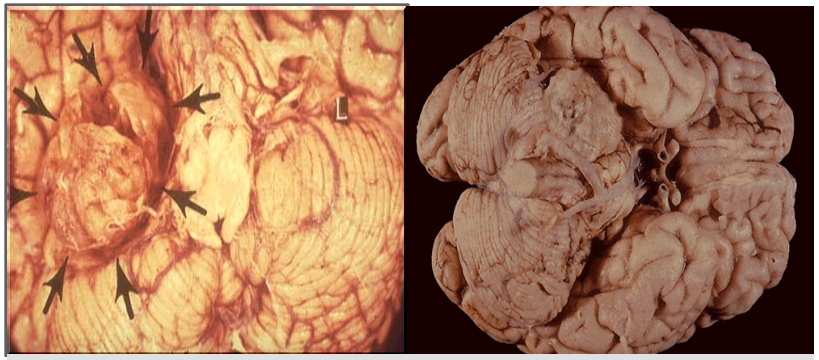
- **Notice :**
- CSF of increased protein from **IgG that demonstrates oligoclonal** bands on electrophoresis is very consistent with this diagnosis.

## CASE 4:

- A39 years old man complains that he had noticed a progressive hearing loss (8th C.N.) over a 2 years period. Except for occasional headache, he has no other complaints . Evaluation discloses severe sensorineural hearing loss of the left side . MRI shows 1.5 cm. **mass at the left cerebellopontine angle**. What is your provisional diagnosis ?

**Diagnosis: Shwannoma**

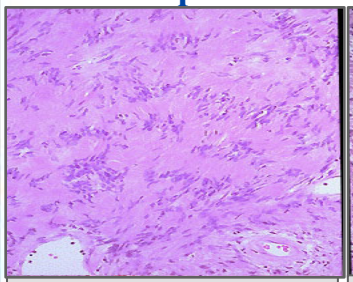
**Gross:**



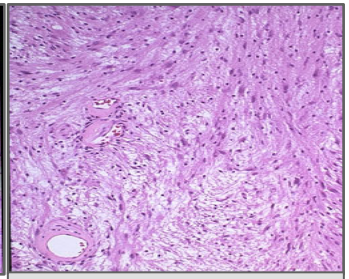
- nerve sheath tumor
- seen most frequently on the eighth nerve (acoustic neuromas),
- **occupy the cerebello- pontine angle** ( arrows).


**fish-flesh** like soft tan appearance

**Microscopic :** **Low Power Field Microscopy**

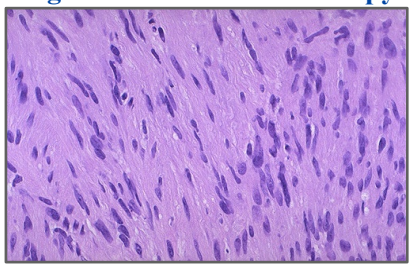


- **"Antoni A" pattern** (more cellular) with palisading nuclei surrounding pink areas **(Verocay bodies)*.**



**"Antoni B"** pattern with a looser stroma, fewer cells.

**High Power Field Microscopy**



- Note :

Acoustic tumors (benign) can be removed, but usually not without damaging the eighth nerve and sometimes the facial nerve and brain stem.

* Verocay bodies hyalinized acellular areas composed of reduplicated basement membrane

## CASE 5:

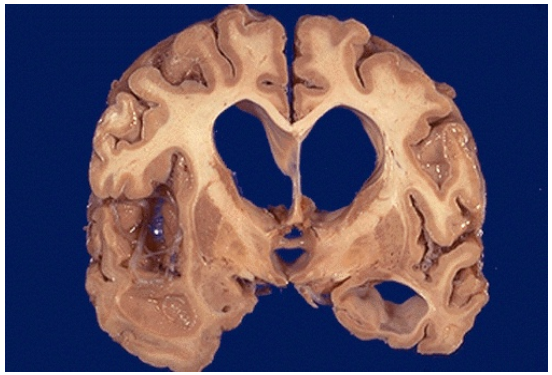
- A 9 months infant was suffering from enlarged head size and admitted to hospital with convulsions, went into coma and died. Autopsy was done and the brain was large with dilated ventricles . What is your provisional diagnosis?

**Diagnosis: Hydrocephalus**

**Gross:**



Increasing head size with congested scalp vein.



Dilation of the cerebral ventricle.

**- Note :**

**Hydrocephalus can be due to lack of absorption of CSF or due to an obstruction to flow of CSF.**

## CASE 6 :

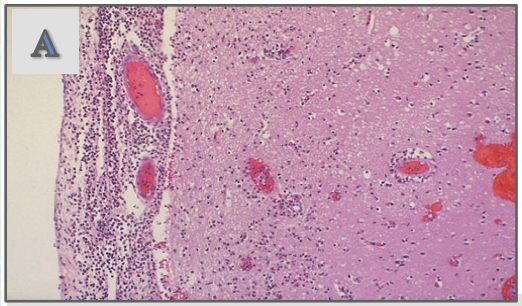
- 4 years old child who was treated from otitis media and suddenly complained from headache, vomiting, fever and stiff neck. CSF was found to be **clouded** with abnormal increase of neutrophils, increased protein and absence of sugar. Gram stain of the CSF fluid showed meningococci . What is your diagnosis ?

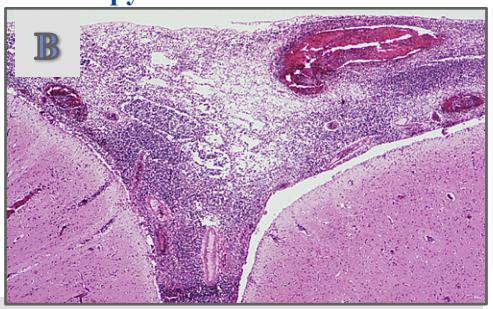
**Diagnosis: Bacterial (pyogenic ) meningitis**

**Gross:**

- Bacterial infection of the arachnoid membrane, subarachnoid space, and cerebrospinal fluid.
- A creamy purulent exudate covers the cerebral hemispheres

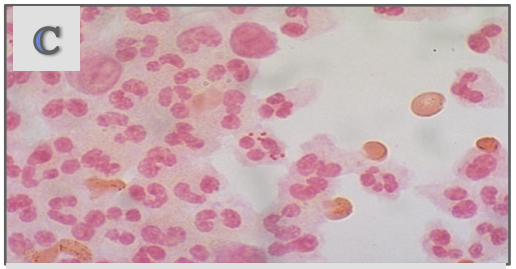
**Microscopic :** **Low Power Field Microscopy**




**A & B:**

1) **Neutrophils exudate.**
2) **Dilation of the vessel peridomenat**
3) **Inflammatory cell in Virchow-Robin space** (the perivascular space around the veins and arteries of the central nervous system)
4) **edema**




**C:** Culture shows gram negative diplicocci organisms in neutrophils **(Neisseria meningitidis)**

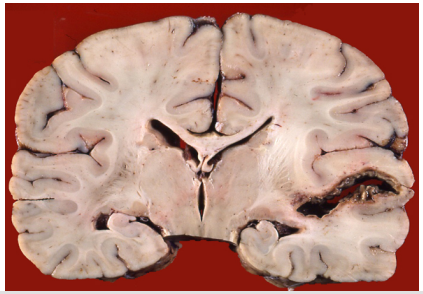
**Complications:** Phelbitis, leptomeningeal fibrosis leads to hydrocephalus , deafness, or infarction

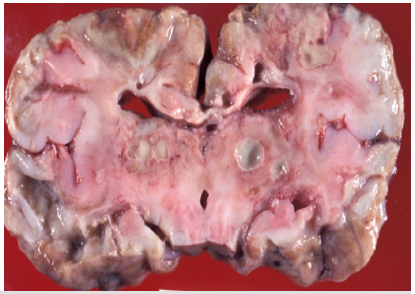
## CASE 7:

A 35 years old lady complains from otitis media . Suddenly she suffers from headache and convulsions. Brain MRI **reveals 5 cm. fluid filled cavity in the temporal lobe**. Examination of the CSF shows increased pressure with lymphocytes and increased protein but there is no change of sugar content.What is your diagnosis ?

**Diagnosis: Cerebral abscess**

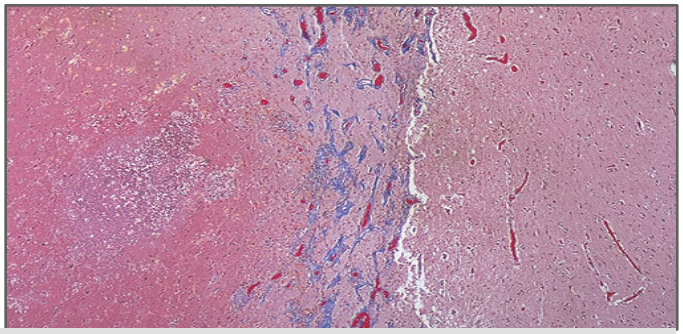
**Gross:**



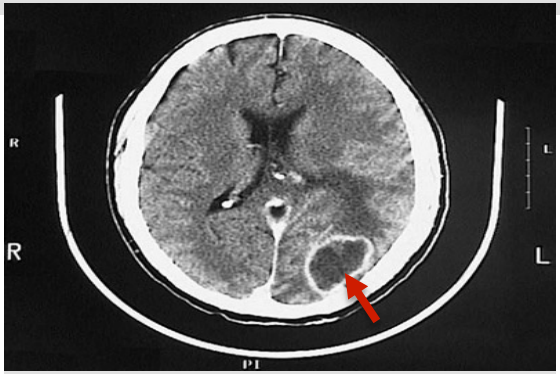


well-defined capsulated lesion **( a liquefactive center with yellow pus) surrounded by a thin wall.**

**Microscopic :**



1) Liquefactive necrosis + neutrophils (left side)
2) Fibrotic wall surrounded the abscess




(CT scan) Brain abscess with **ring enhancement** (not rim)

**Abscesses usually result from:**

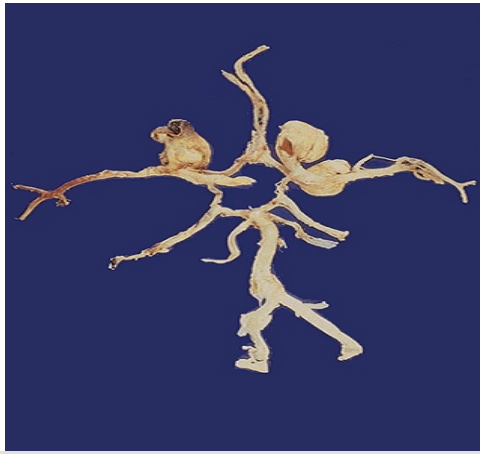
- hematogenous spread of bacterial infection
- direct penetrating trauma
- extension from adjacent infection in sinuses.

## CASE 8:

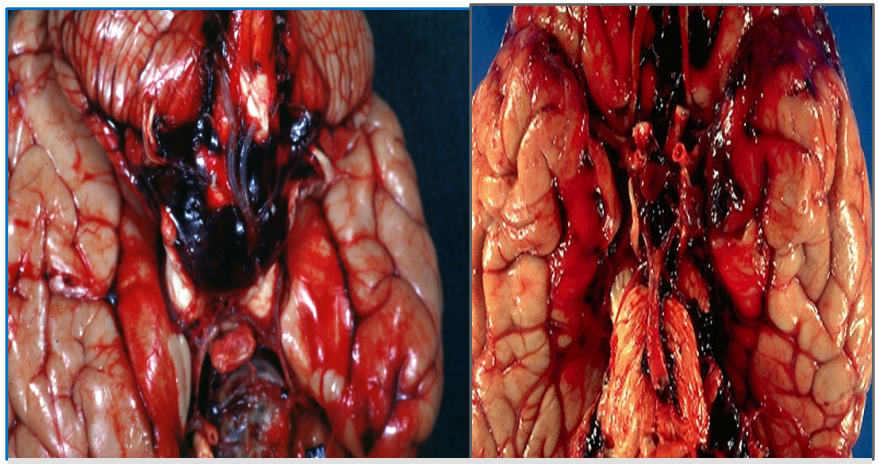
A previously healthy 31-year-old woman experiences a severe headache and loses consciousness within an hour. An emergent head CT scan reveals extensive subarachnoid hemorrhage at the base of the brain. She is a febrile. A lumbar puncture yields cerebrospinal fluid with many red blood cells, but no white blood cells. The CSF protein is slightly increased, but the glucose is normal. What is your provisional diagnosis ?

**Diagnosis: Berry aneursym**

**Gross:**

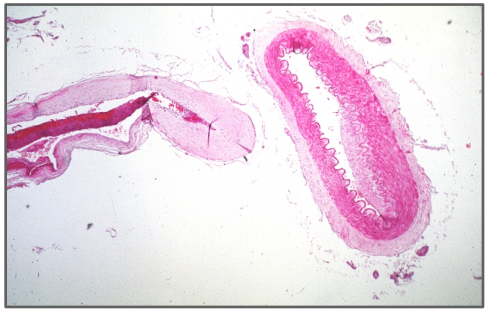


Circle of Willis showing 3 Berry aneurysms



- Subarachnoid hemorrhage
- rupture of the aneurysm

**Microscopic :**



Artery showing lack of medial structure

- Notes :

*Associated with Autosomal dominant polycystic kidney

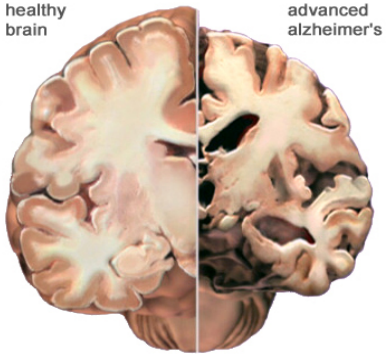
- Saccular aneurysms most frequently form in first- and second-order arteries originating from the cerebral arterial circle (circle of Willis) at the base of the brain

## CASE 9:

- A 85 years old man complains of **progressive loss of memory**, disorientation and alterations in mood and behavior since 20 years. He was admitted to hospital because he was disabled and immobile and he died in hospital after one week of admission. Autopsy was done and the brain cortex was found to be atrophied. What is your diagnosis ?

**Gross:**

**Diagnosis: Alzheimer's disease**



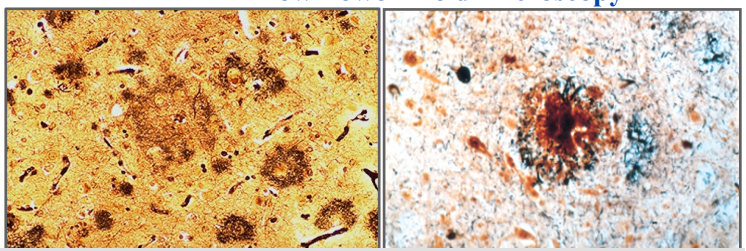


atrophy seen here mainly in the frontal and parietal regions

**Atrophy of the brain due to widening of sulci & narrowing of gyri**

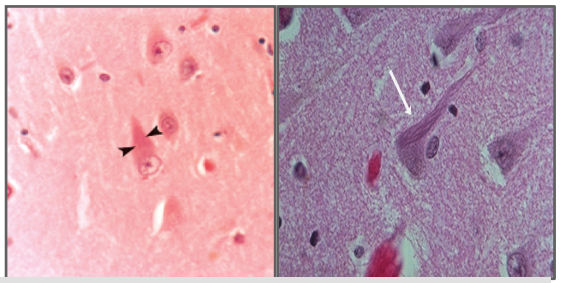
**Microscopic :**

**Low Power Field Microscopy**



SILVER STAIN showing **senile شيخوخه plaque with amyloid core** (which are collections of degenerative presynaptic endings along with astrocytes and microglia) **dystrophic neurites**

**High Power Field Microscopy**



Neurofibrillary tangles (due to hyperphosphorylation of tau protein) They are composed of cytoskeletal intermediate filaments.