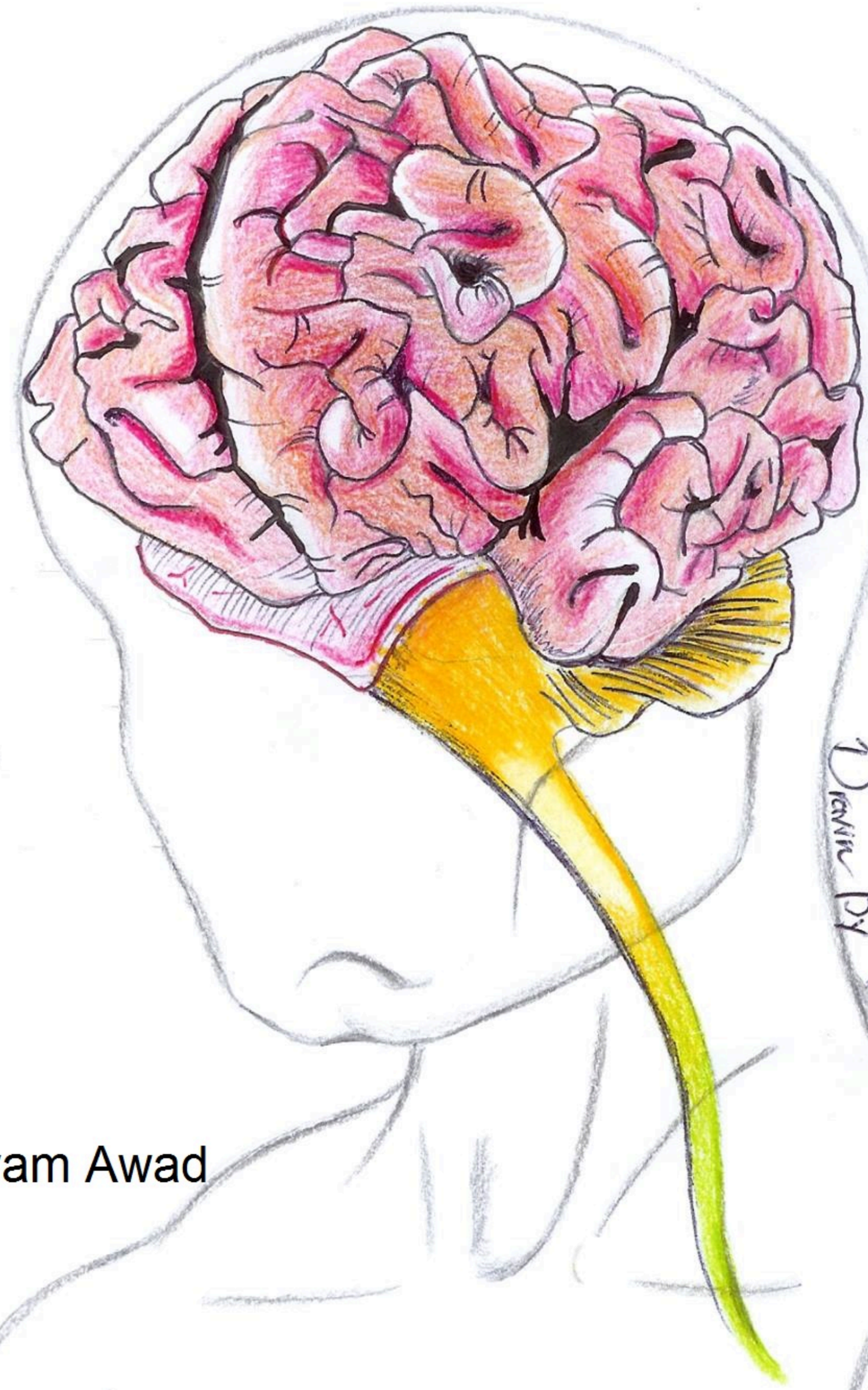
CENTRAL NERVOUS SYSTEM

- ○ Handout
- ○ Sheet
- ○ Slide

- ○ Anatomy
- ○ Physiology
- ■ Pathology
- ○ Biochemistry
- ○ Microbiology
- ○ Pharmacology
- ○ PBL



Drawn By Tarig Bushnaq ...

Done By :

Dr. Name : Heyam Awad

Lec # : 8

CNS 8/ tumors

Dr Heyam Awad
FRCPath

CNS tumors

- ½- ¾ are primary, the rest are metastatic.
- 20% of paediatric tumors

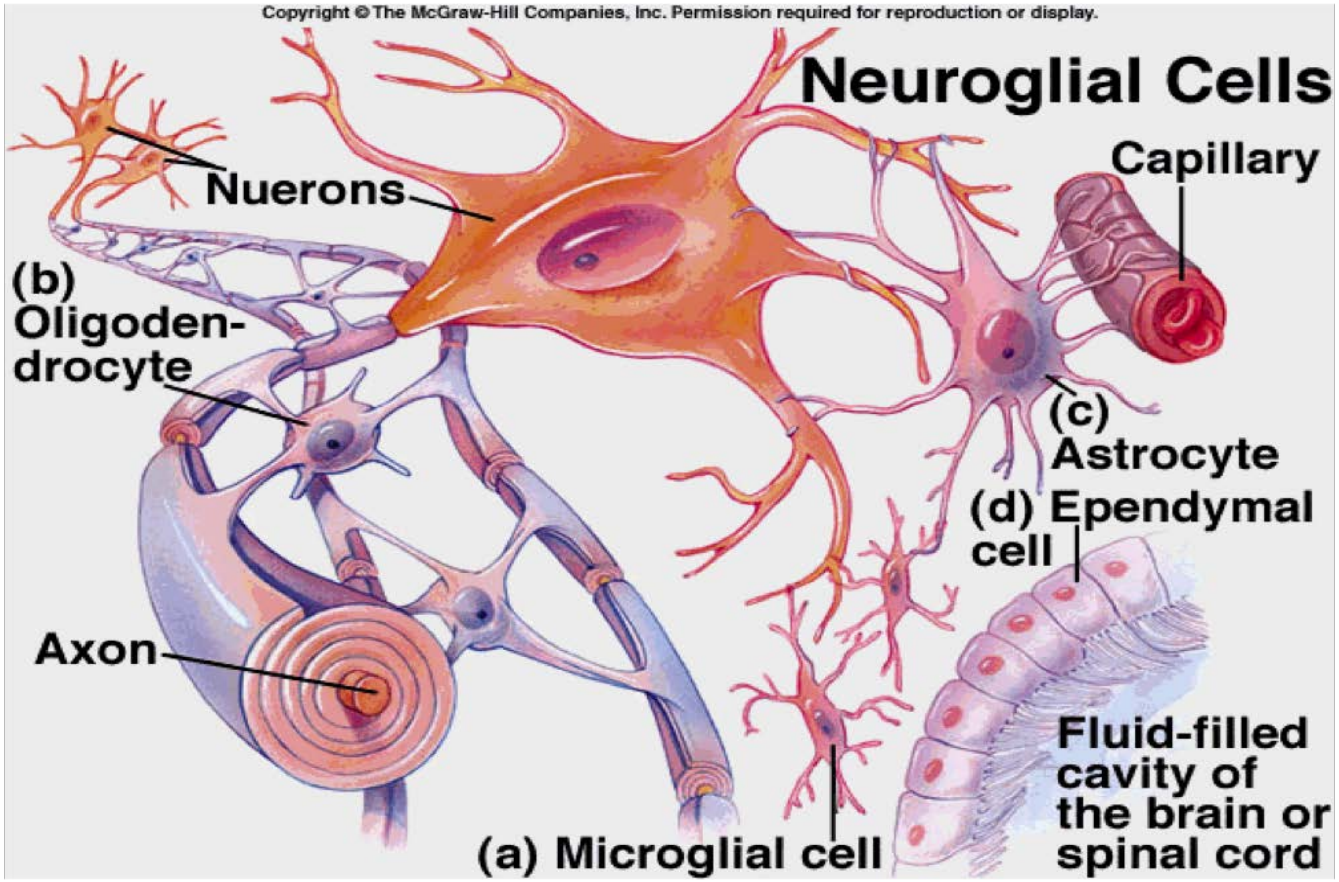
CNS tumors/ characteritics

- No premalignant or in situ stage
- Low grade lesions can be idly infiltrate with serious clinical deficit
- Anatomical site important in outcome regardless of type, grade
- Rarely spread outside CNS

CNS tumors

- **Gliomas**: astrocytoma, oligodendroglioma and ependymoma
- **neuronal tumors**: central neurocytom, ganglioglioma, dysembryoblastic neuroepithelial tumor.
- **Embryonal neoplasms: medulloblastoma**
- **Meningiomas**
- **Primary CNS lymphoma**
- **Germ cell tumors**
- **Metastatic tumors**

Gliomas/ tumors of glial cells



astrocytoma

- Several types.
- Most important: diffuse astrocytoma
- : pilocytic astrocytoma

WHO classification

WHO designation	WHO grade
• pilocytic astrocytoma	I
• Astrocytoma,well diff	II
• anaplastic	III
• glioblastoma	IV

Diffuse astrocytoma

- 80% of adult gliomas.
- 40- 60 years of age
- Location: cerebral hemispheres
- Present with: seizures, headache, focal neurologic deficit
- Genetics: mutations in p53 and Rb genes

Diffuse astrocytoma

- Spectrum of histological differentiation:
- Well differentiated
- Analastic astrocytoma
- Glioblastoma

- Prognosis affected by grade

Well differentiated astrocytoma

- Can be static for several years
- But progress
- Mean survival is more than five years
- When progress: rapid deterioration + anaplastic histological features

glioblastoma

-Poor prognosis

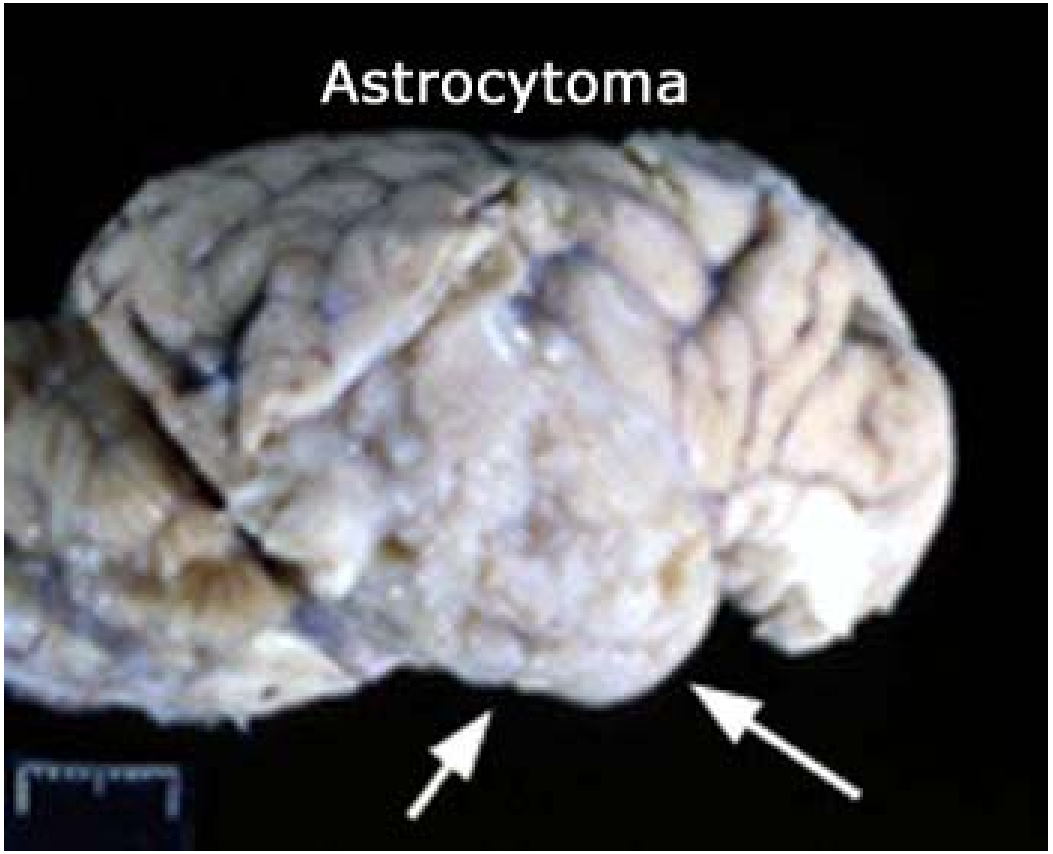
-15 months survival even with aggressive treatment

-Can result due to progression from a previous astrocytoma or the tumor can start as glioblastoma

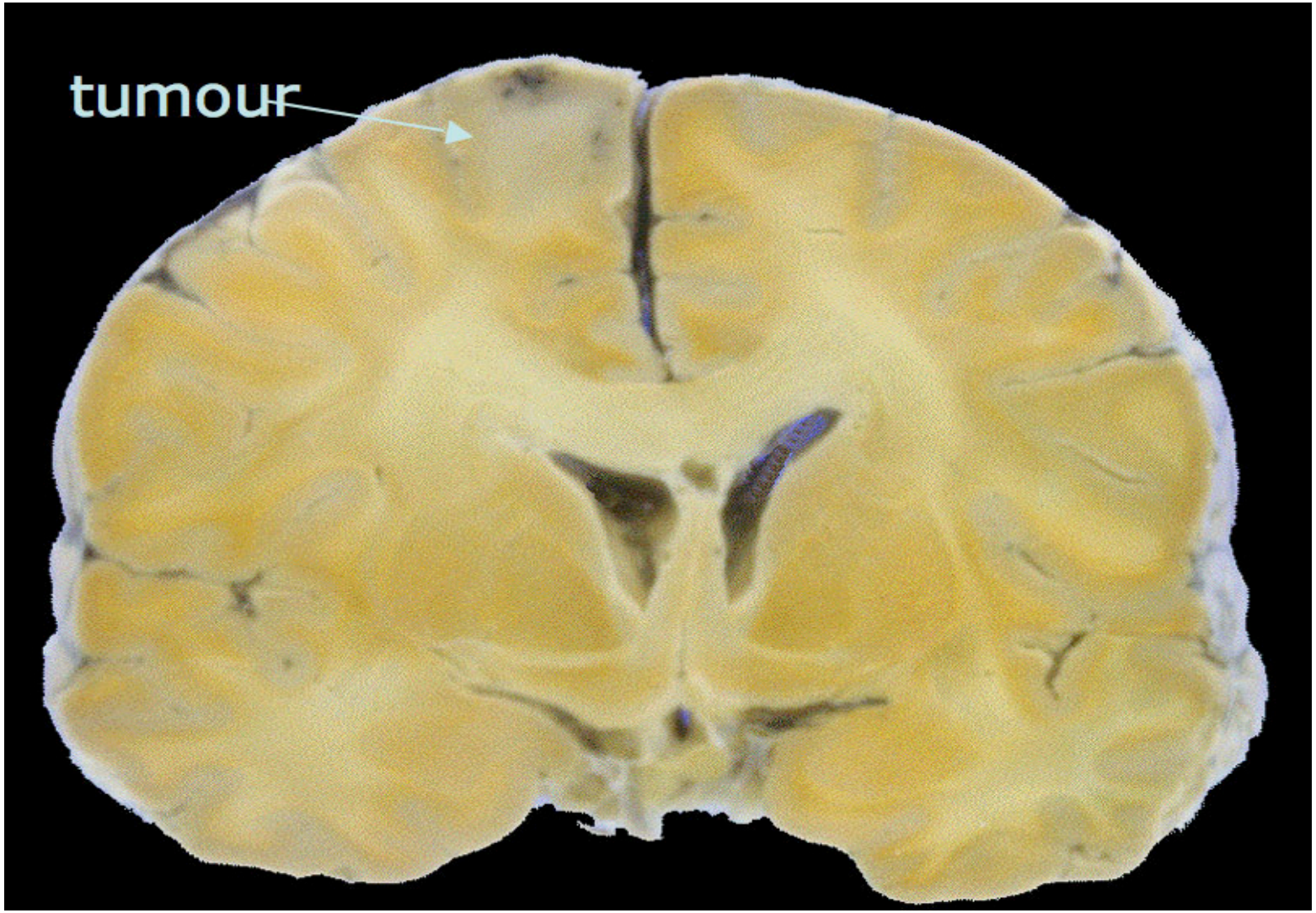
morphology

- Well differentiated: Poorly defined grey, infiltrative tumors that invade the brain without forming a discrete mass
- Glioblastoma: variation of the tumor appearance (multiforme); soft , necrotic and hemorrhagic areas.

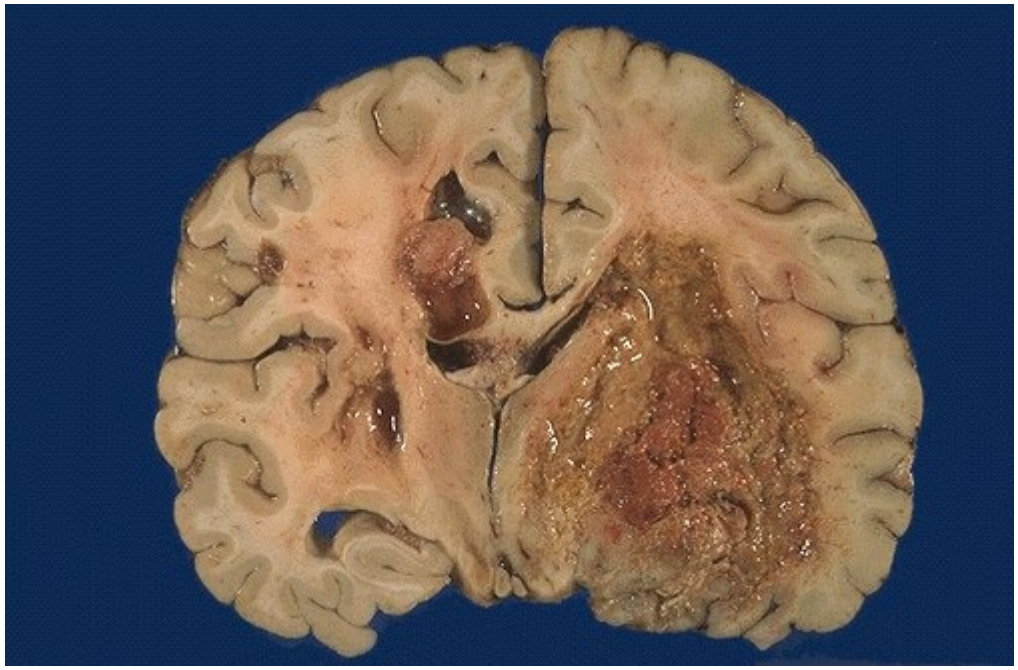
Well diff astro



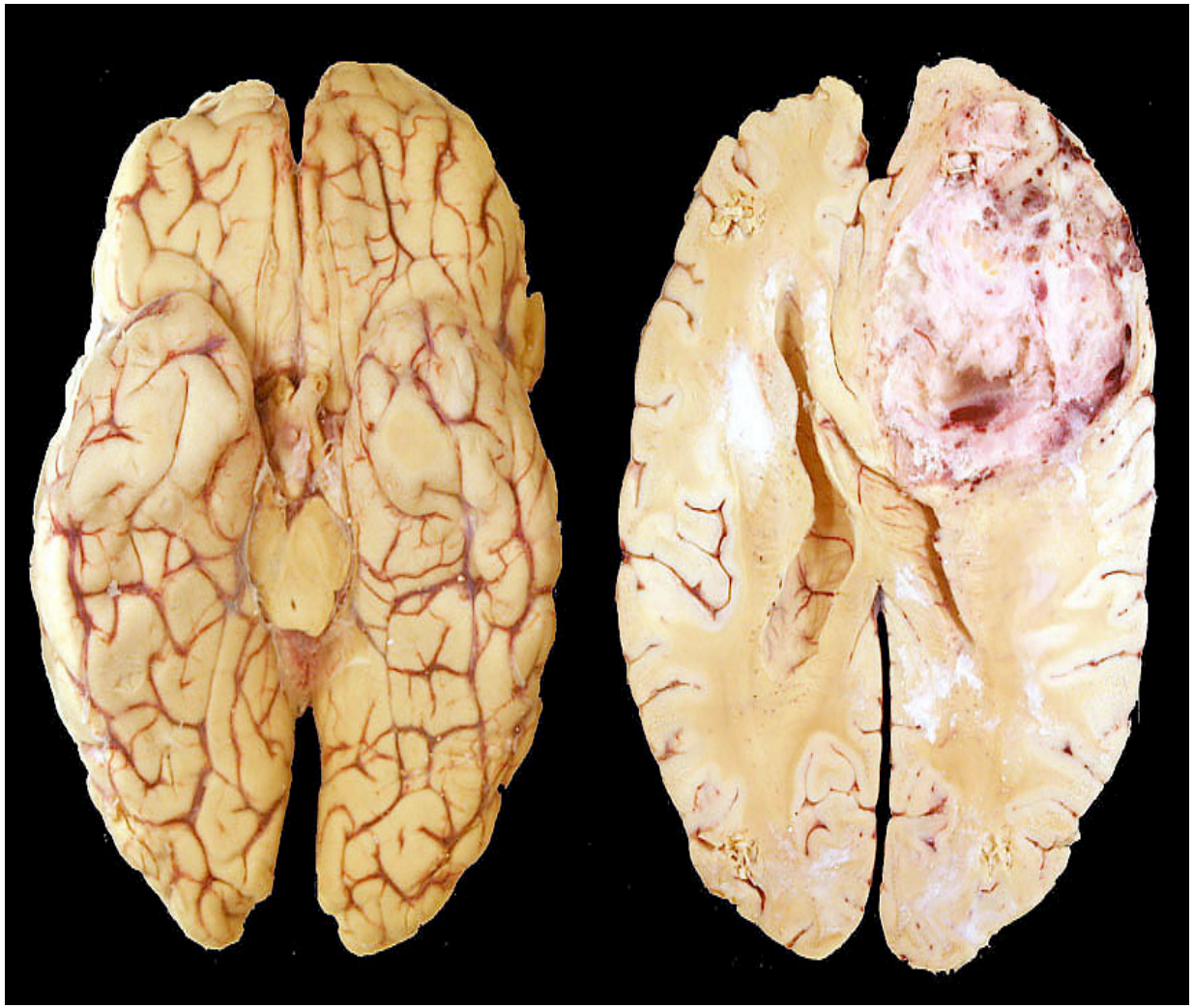
Mowell diff astrorphology



glioblastoma



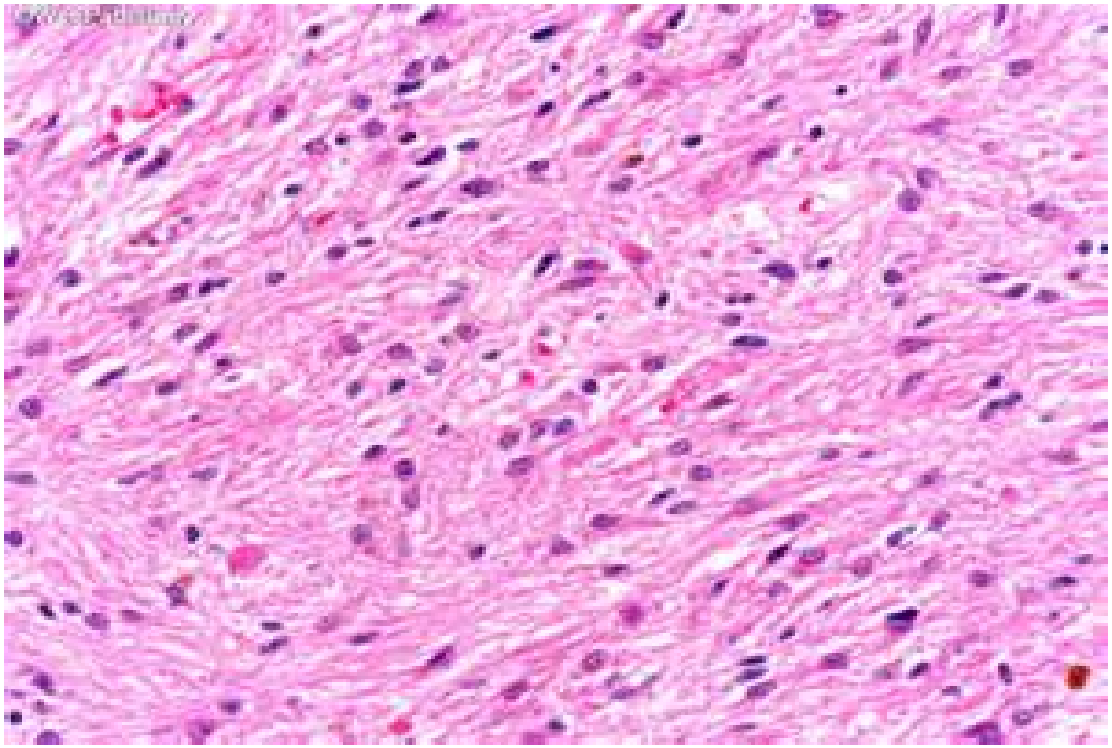
glioblastoma



Microscopic features

- Well diff: mild to moderate increase in glial cells.
- Some nuclear pleomorphism
- Background: fibrillary due to fine astrocytic processes.. These are positive with glial fibrillary acidic protein (GFAP)

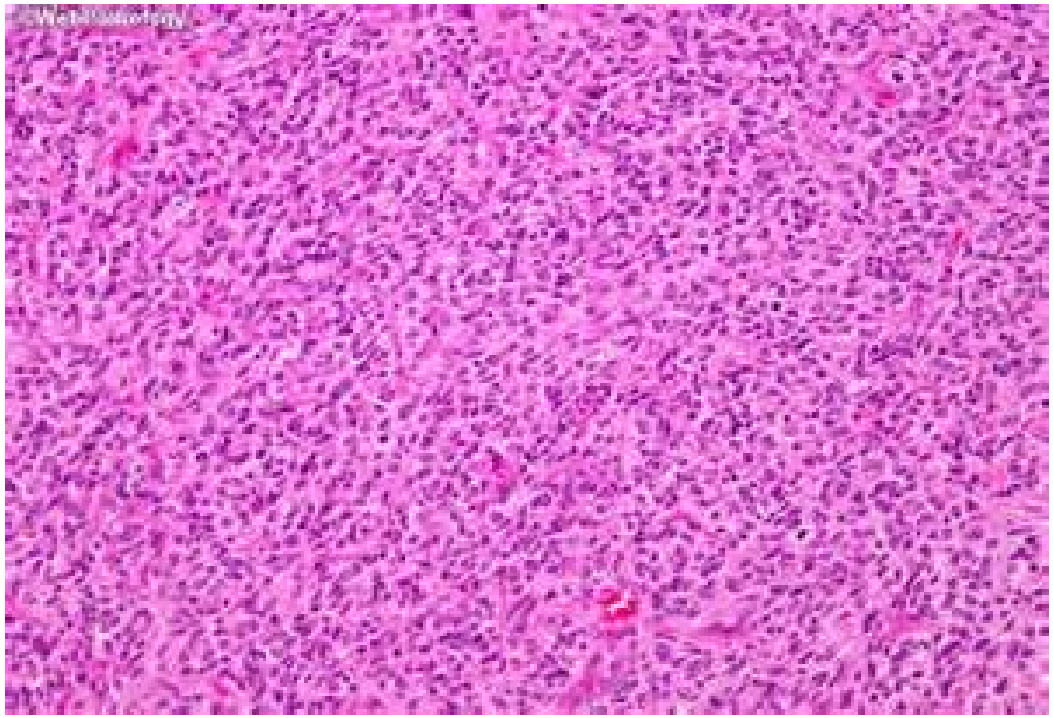
Well diff astro



Anaplastic astro

- More cellular than well diff astro.
- More pleomorphism
- Mitotic figures

Anaplastic astro



Glioblastoma multiforme

Looks like anaplastic plus

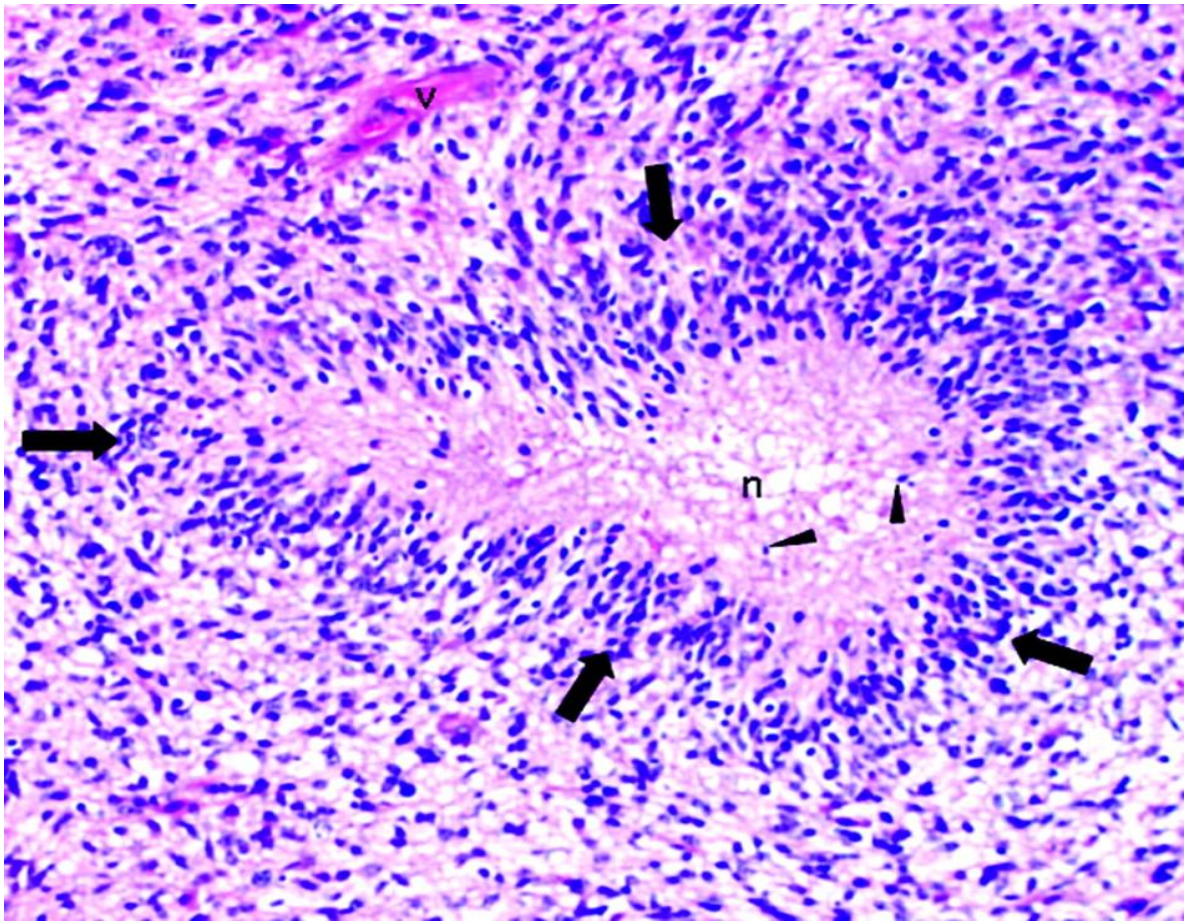
- Necrosis (usually pesudopalisading)
- or vascular proliferation

palisade

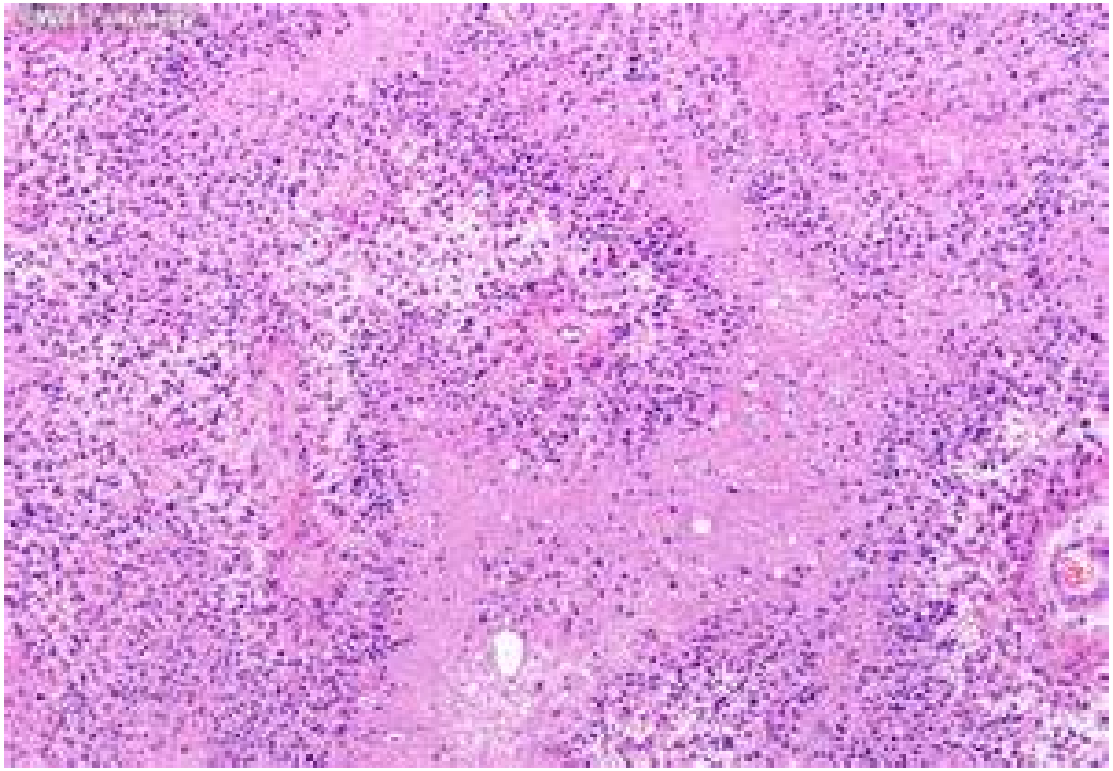
-high fence made of pointed stakes that was used in the past to protect a building or area

-palisades : a line of steep cliffs especially along a river or ocean

Glioblastoma/ palisaded nuclei around necrotic area



glioblastoma



Pilocytic astrocytoma

- Relatively benign
- In children and young adults
- Mostly: in cerebellum
- Can involve: third ventricle, optic pathway, spinal cord and rarely cerebral hemispheres

- Usually : cystic component.
- Recurrence of symptoms after incomplete excision: usually due to enlargement of the cystic component.
- Mutations: BRAF

morphology

- Solid and cystic components
- Solid: well defined

Microscopically:

-bipolar cells with long GFAP positive processes

-Rosenthal fibbers

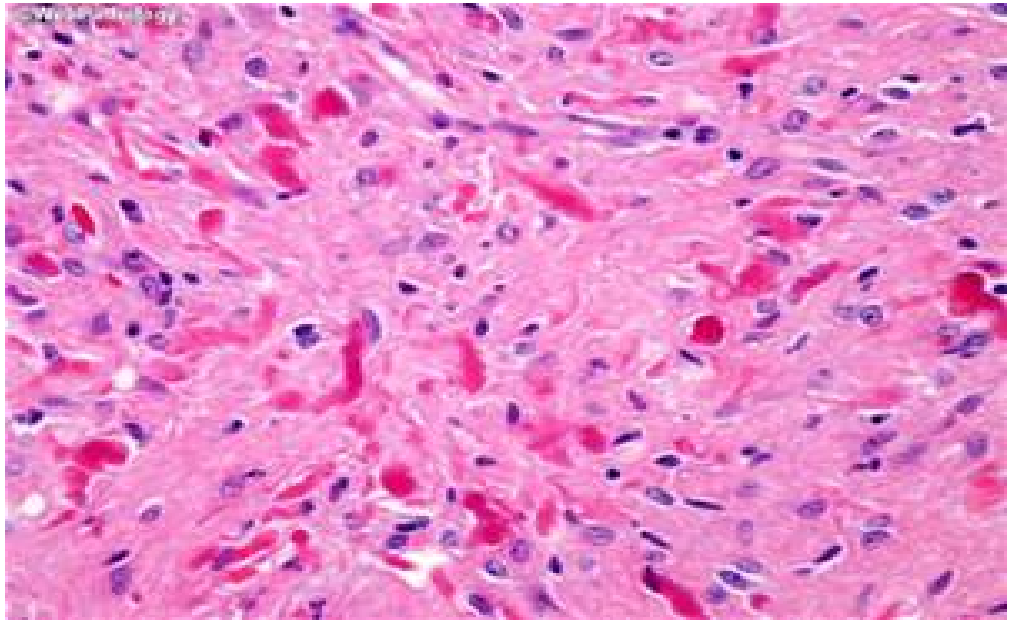
-eosinophilic granular bodies

-microcysts

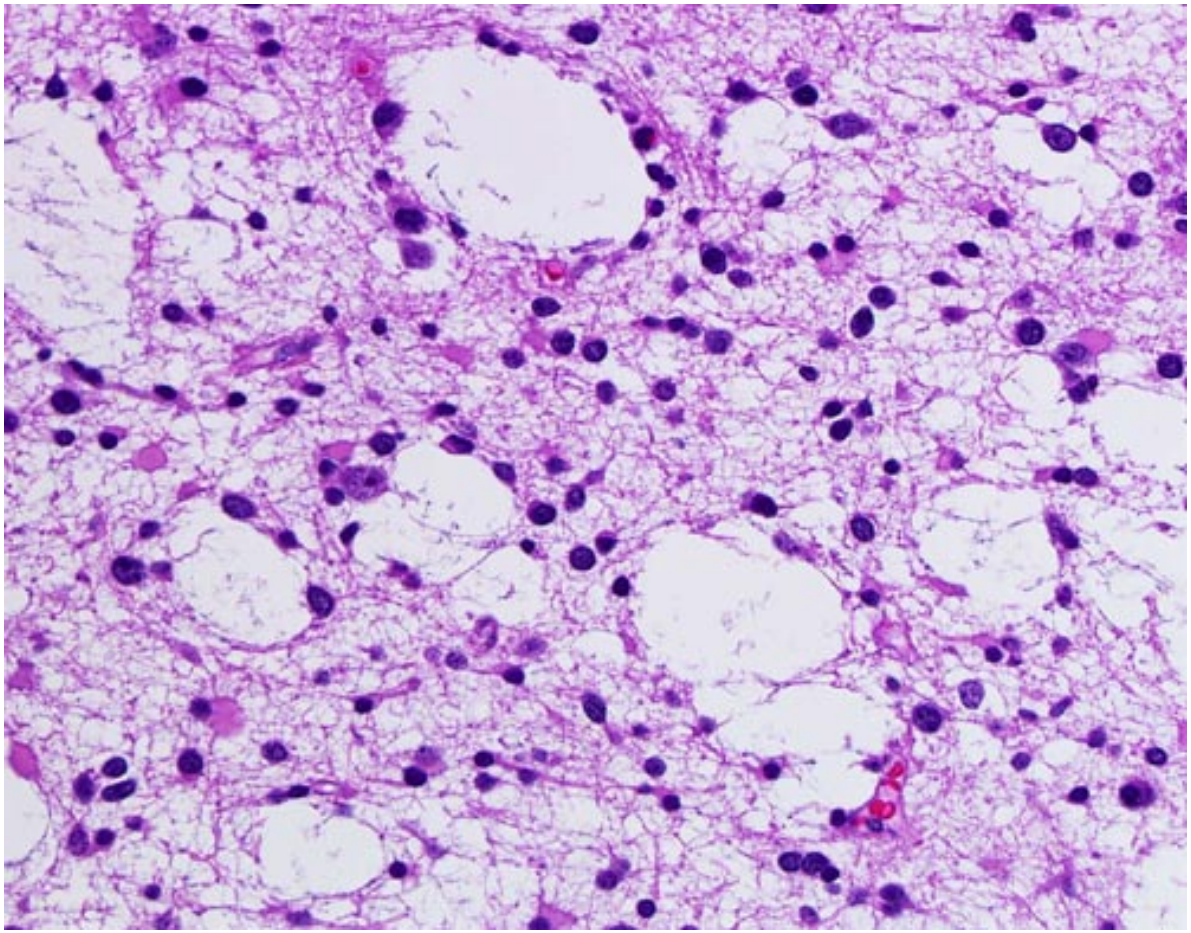
-mitosis and necrosis are rare

Pilocytic astro

- Rosenthal fibres: thick ,elongated , eosinophilic protein aggregates seen in astrocytic processes.
- Can also be seen with chronic gliosis



Pilocytic/ microcysts



oligodendroglioma

- 5-15% of gliomas
- 40-50 years of age
- Cerebral hemispheres
- Better prognosis than astrocytoma of the same grade
- Well diff (WHO II): 10-20 years survival; with treatment
- Anaplastic (WHO III): 5-10 years survival; with treatment

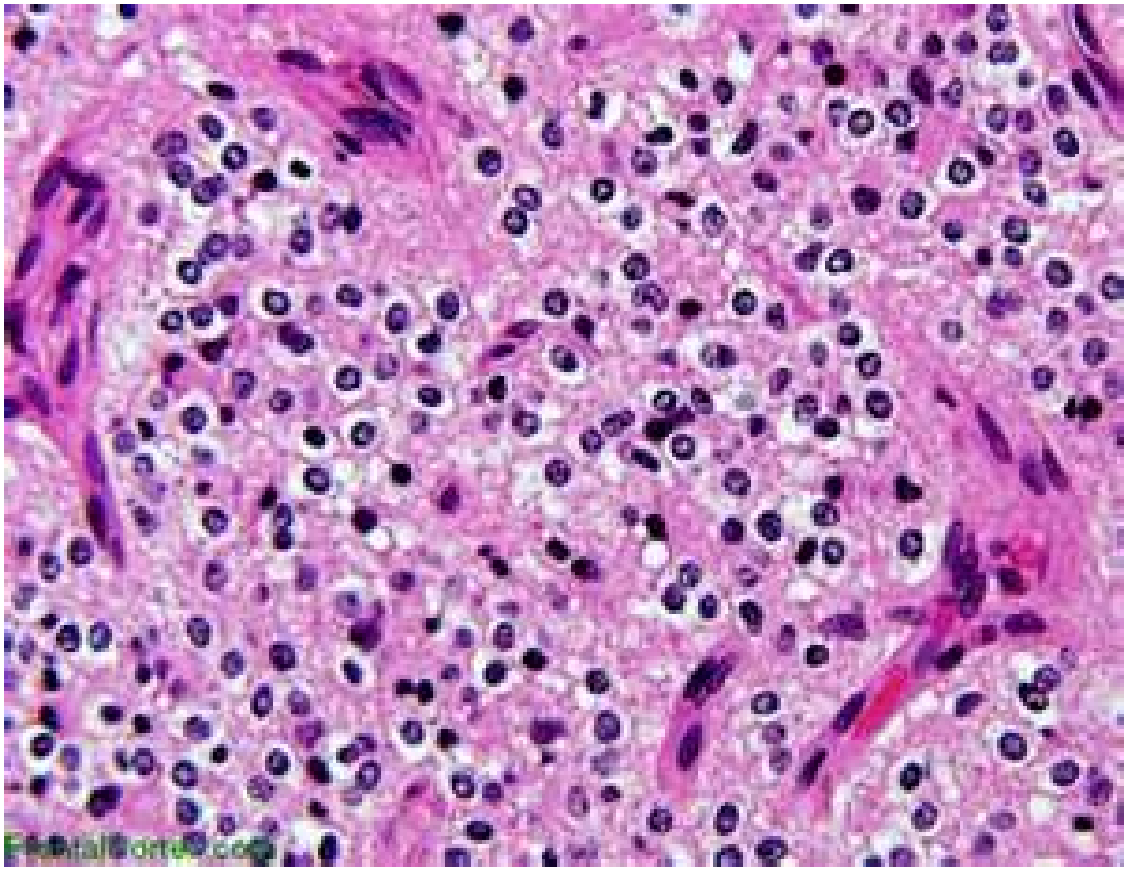
genetics

- Deletions of chromosomes 1p and 19q.
- If this mutation present: highly responsive to chemo and radiotherapy

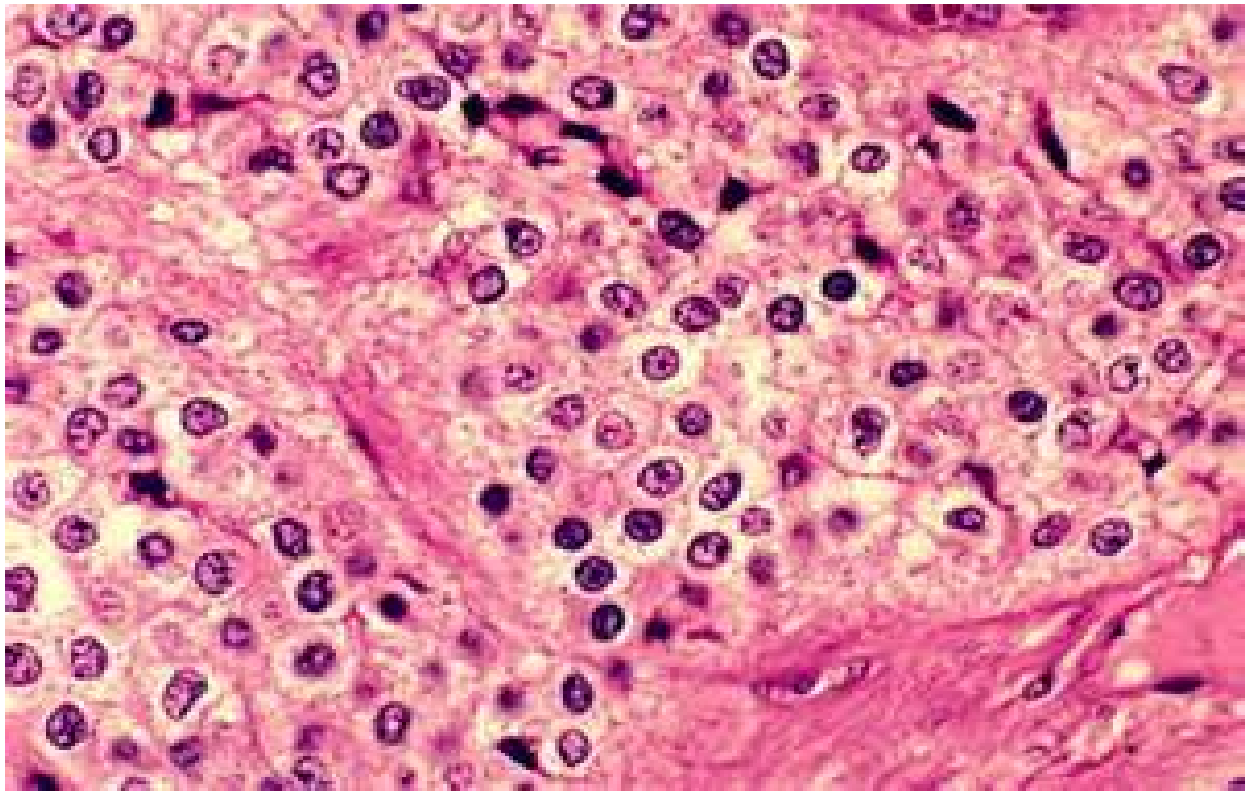
morphology

- Infiltrative, gelatinous masses
- Can have cysts, hemorrhage or calicifications
- Micro: sheets of regular cells with spherical nuclei, granular chromatin, clear cytoplasm, rare mitoses
- Anaplastic: more cellularity, more anaplasia and more mitosis…. Poorer prognosis

oligodendroglioma

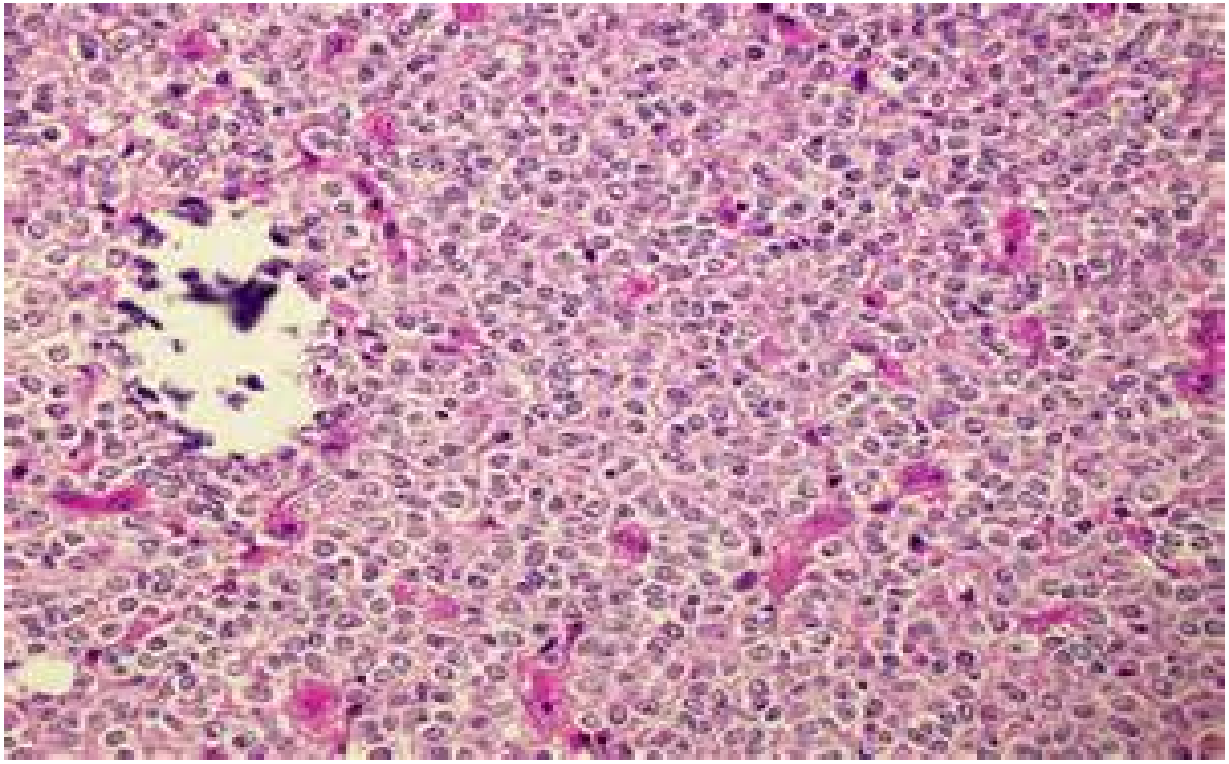


oligo



Anaplastic oligo

- Dense cellularity



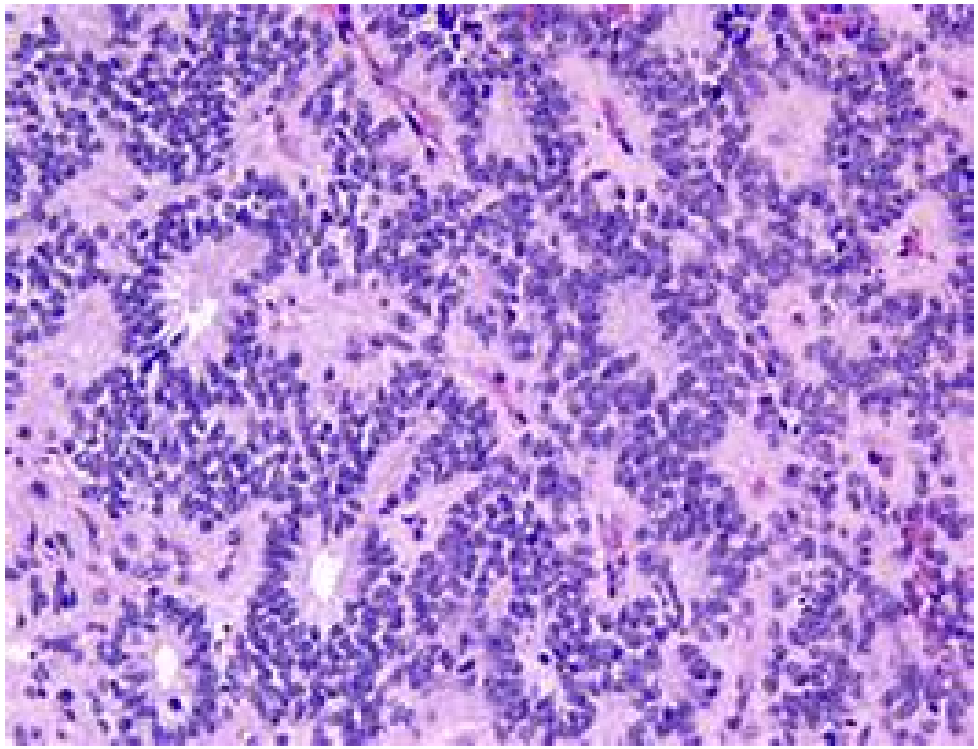
ependymoma

- Arise next to ventricles and central canal of spinal cord.
- First two decades of life: mostly near fourth ventricle
- Adults: mostly spinal cord

morphology

- Solid or papillary masses
- Regular round nuclei, granular chromatin, dense fibrillary bachground, rosette formation around canals, pseudo-rosetts around blood vessels
- Anaplastic ependymoma: cellular, mitosis, necrosis

Ependymoma/ rosettes



Ependymoma/ pseudorossetes