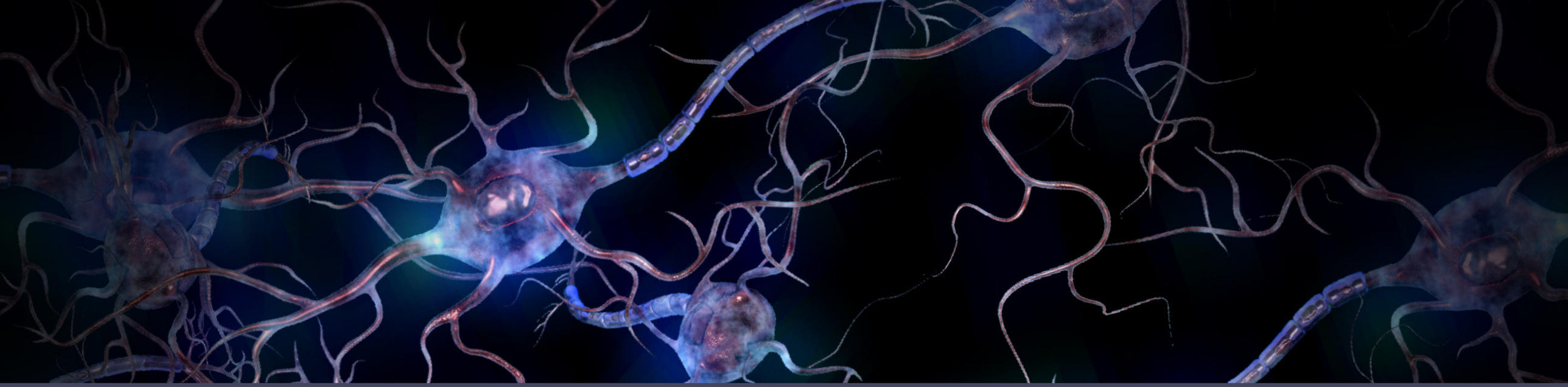


YU - Medicine

Passion Academic Team

Sheet# 2 - Pathology

Lec. Title : Tumors of CNS (II)

Written By : Mesk N Alsouqi

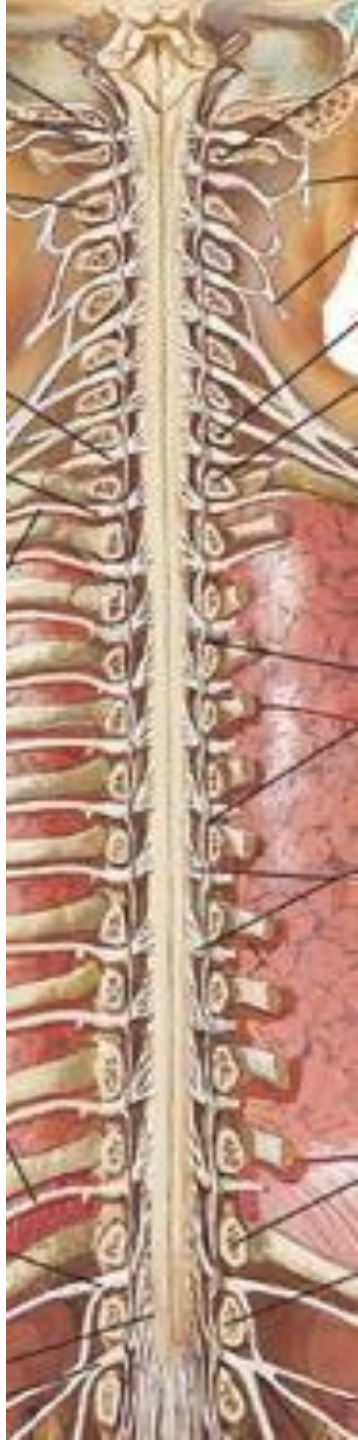
PERIPHERAL NERVOUS SYSTEM

If you come by any mistake , please kindly report it to shaghafbatch@gmail.com

TUMORS

of

CNS II



Gliomas

2. Oligodendroglioma:

- More in 4th & 5th decades
- In frontal or temporal lobes→ favors white matter.
- Deletions of chromosomes 1p and 19q is common → indicates high response to chemo & radiotherapy.
- Better prognosis than that for patients with astrocytomas of similar grade**.

- Ex: Patients with oligondendroglioma grade 2 is Better prognosis than that for patients with astrocytomas of grade 2.

Gliomas

2. Oligodendroglioma:

- Gross(more solid)
  - Mass with cysts, hemorrhage & calcification
- Microscopic & WHO grades:

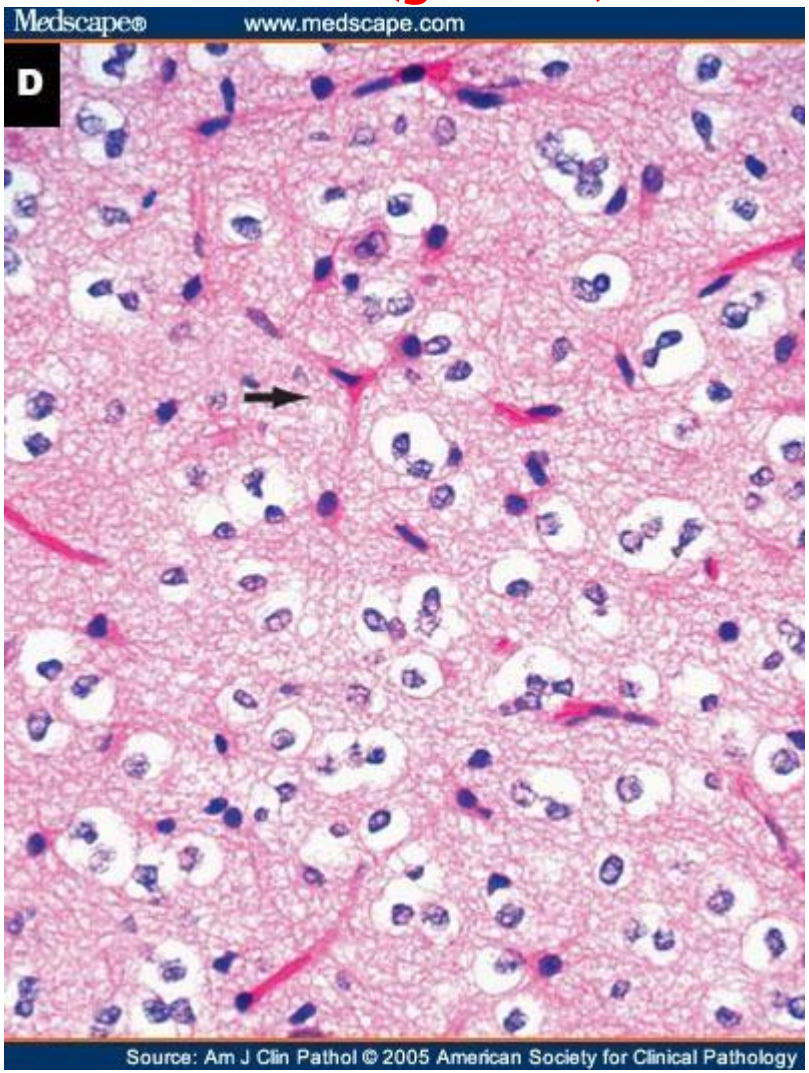
A. Typical (Grade II):

- Small uniform cells surrounded by clear cytoplasm (FRIED EGG APPEARANCE).
- Delicate capillaries.
- Calcifications (90%).
- Absent or minimal mitosis.

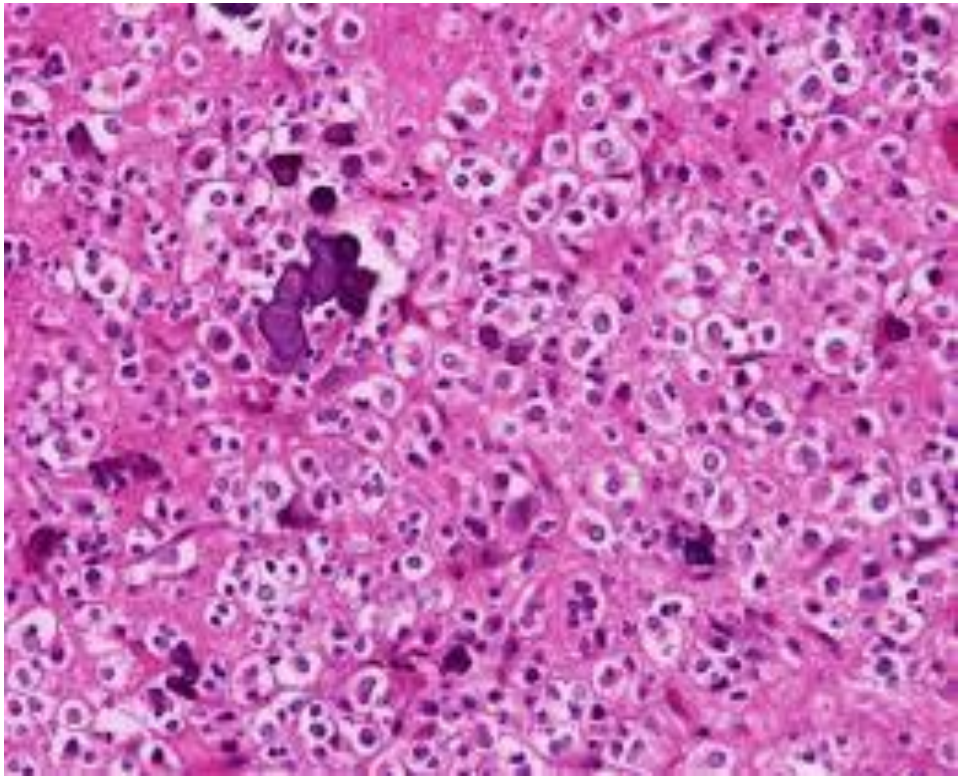
B. Anaplastic (Grade III):

- More cellularity, pleomorphism & mitosis.

Classic(grade II)



Anaplastic(grade III)



Gliomas

3. Ependymoma

- Arise from ependyma-linedventricular system*→ Can cause hydrocephalus & metastesize by CSF:
  - <20 yrs → 4th ventricle
  - >20 yrs → Spinal cord***
- Microscopic & WHO grading:

A. Typical (Grade II) → Regular cells forming:

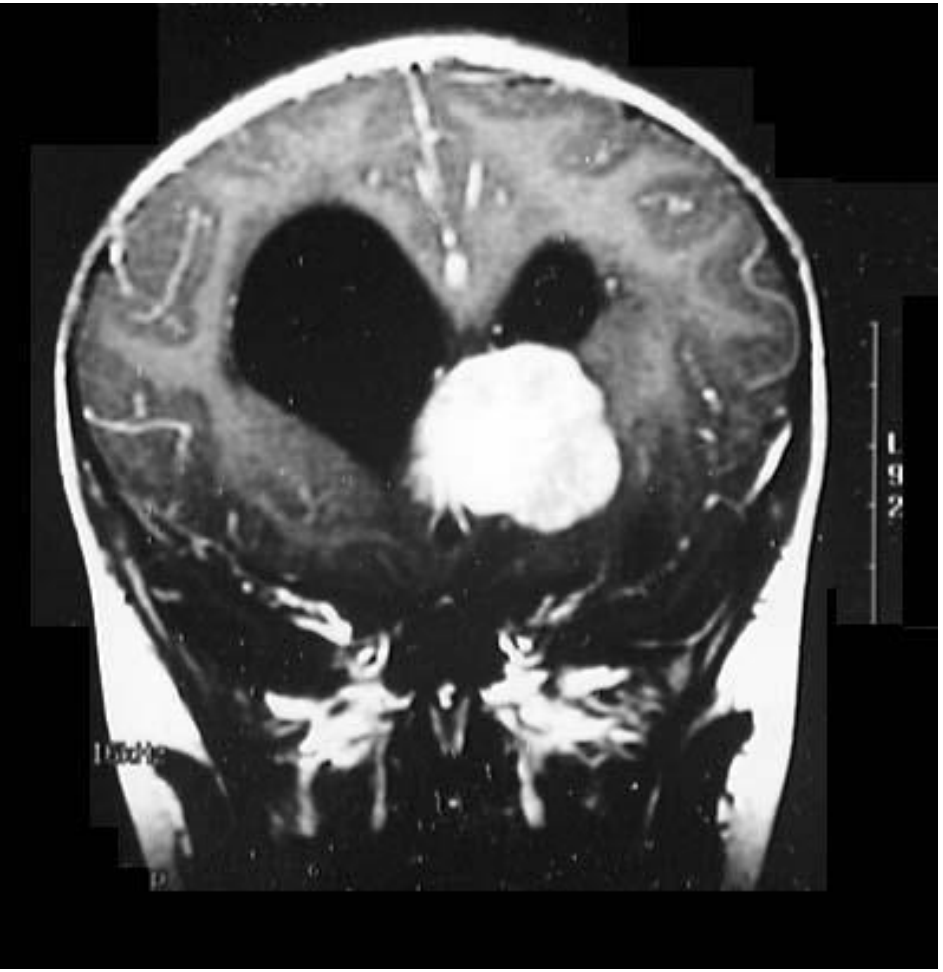
- Ependymal true rosettes. flower shape+ no blood vessels
- Perivascular pseudorosettes.

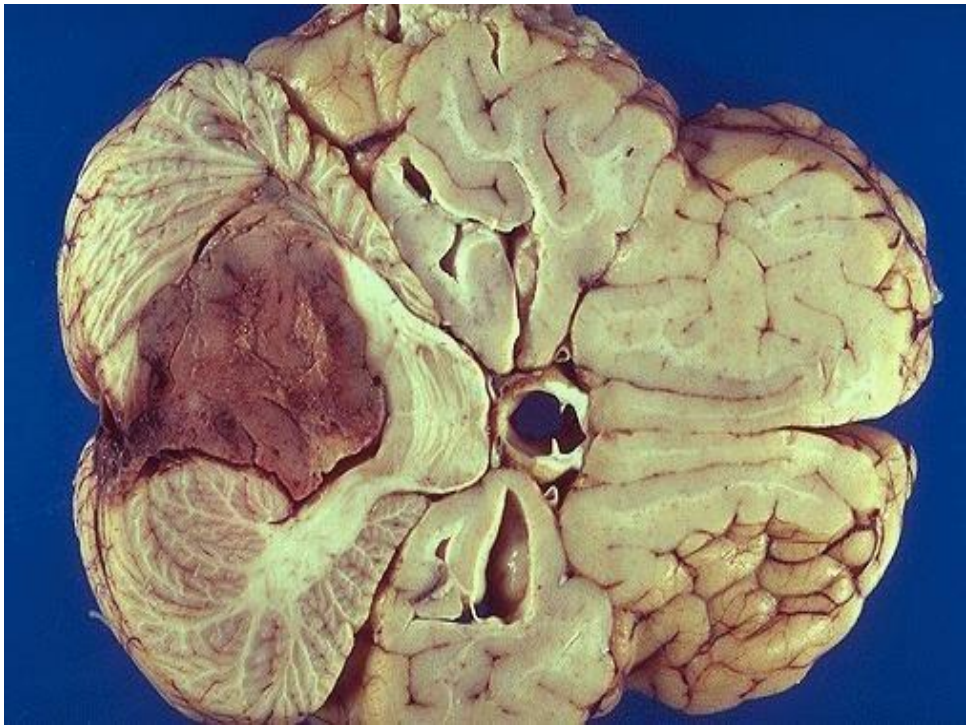
B. Anaplastic (Grade III). around blood vessels +flower shape

Sheet #1

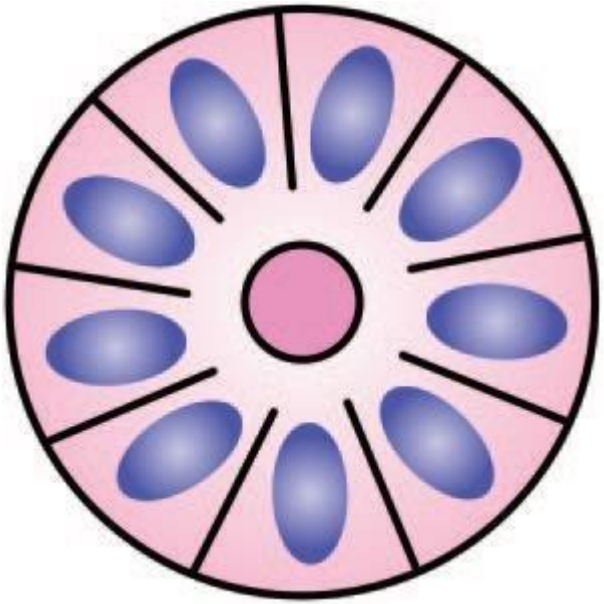
(usually arise inside the ventricle or inside the spinal cord canal).

metastesize by CSF(because of it's location).

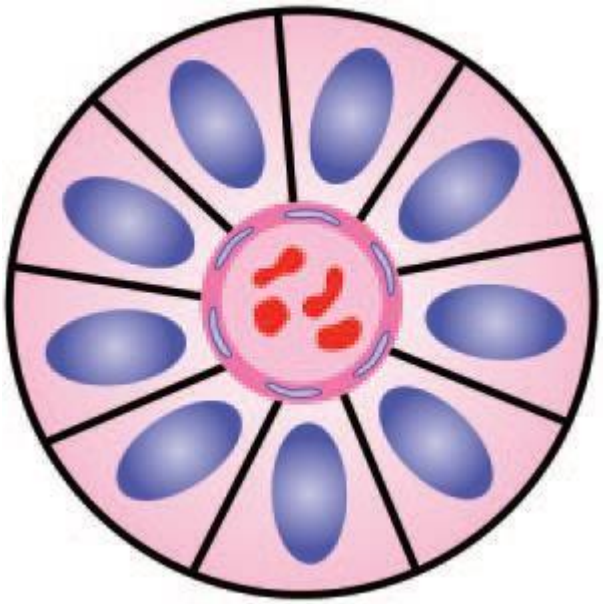


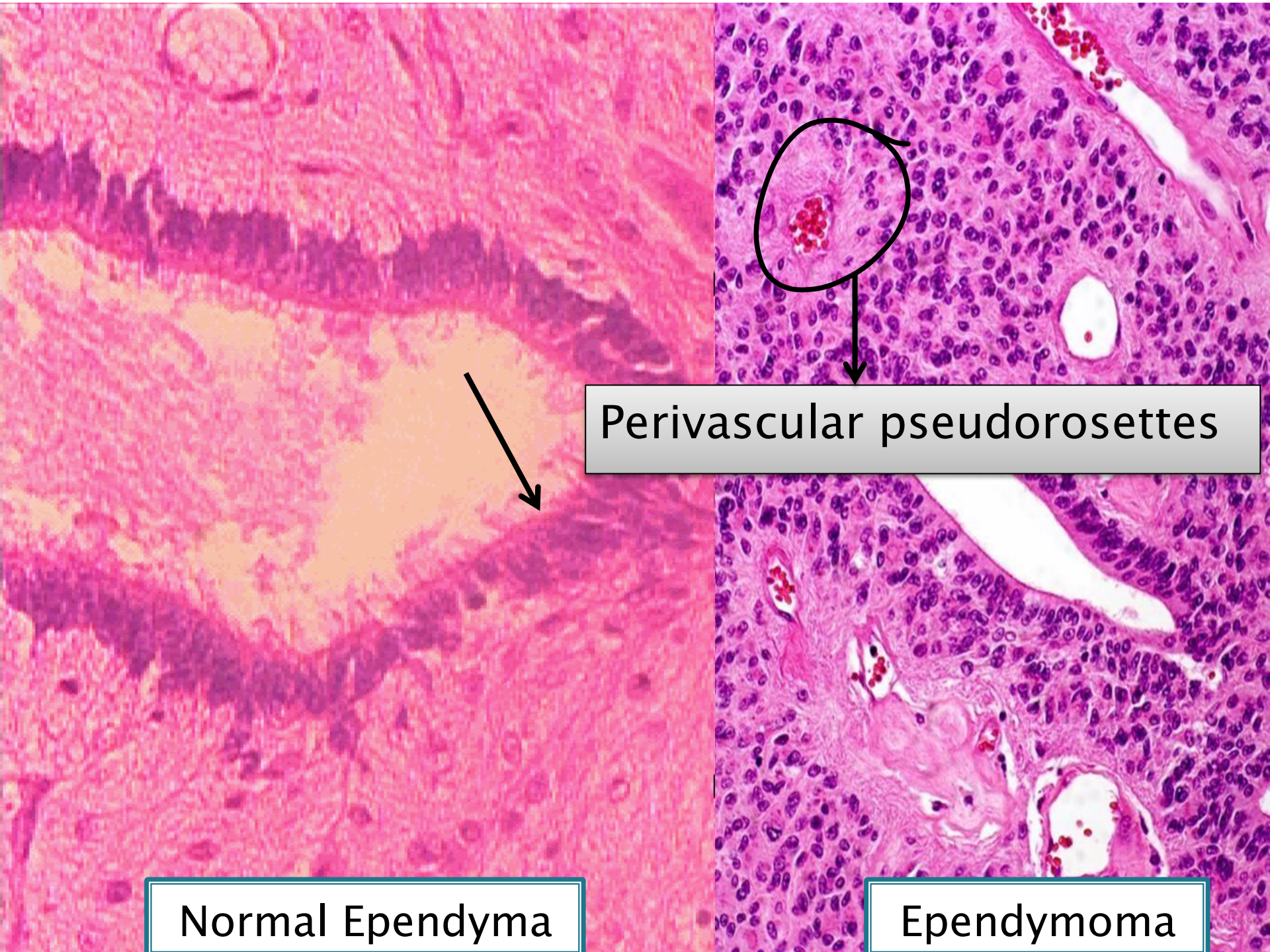


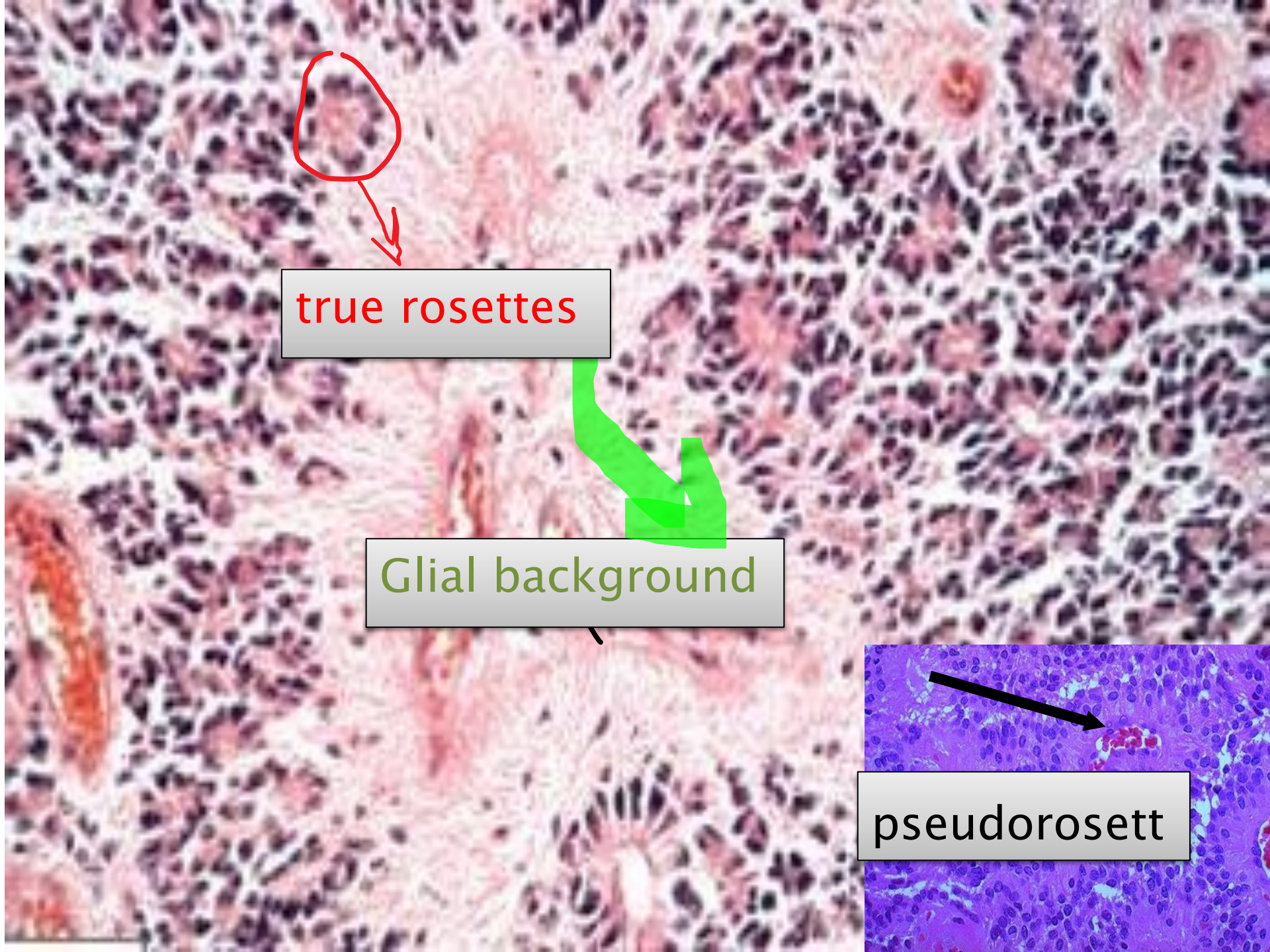
True Rosette



Perivascular Pseudorosette




Perivascular pseudorosettes
Normal Ependyma
Ependymoma


true rosettes
Glial background
pseudorosett

Embryonal (Promitive) Neoplasms

Medulloblastoma

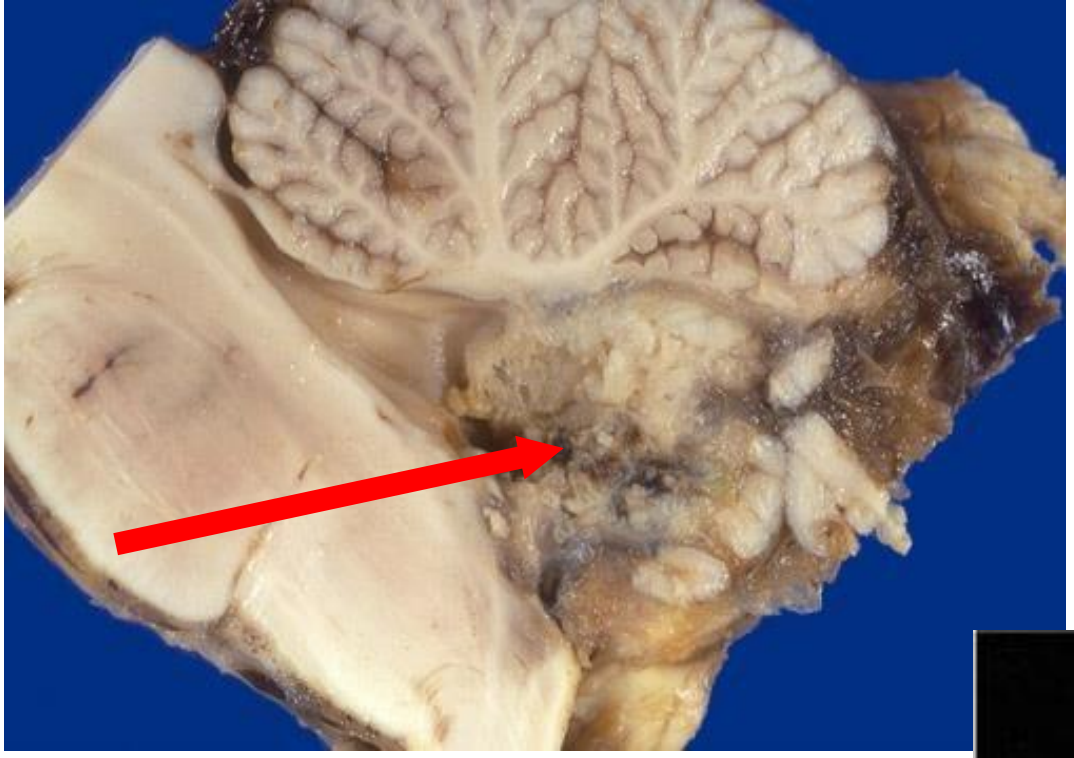
WHO grade IV

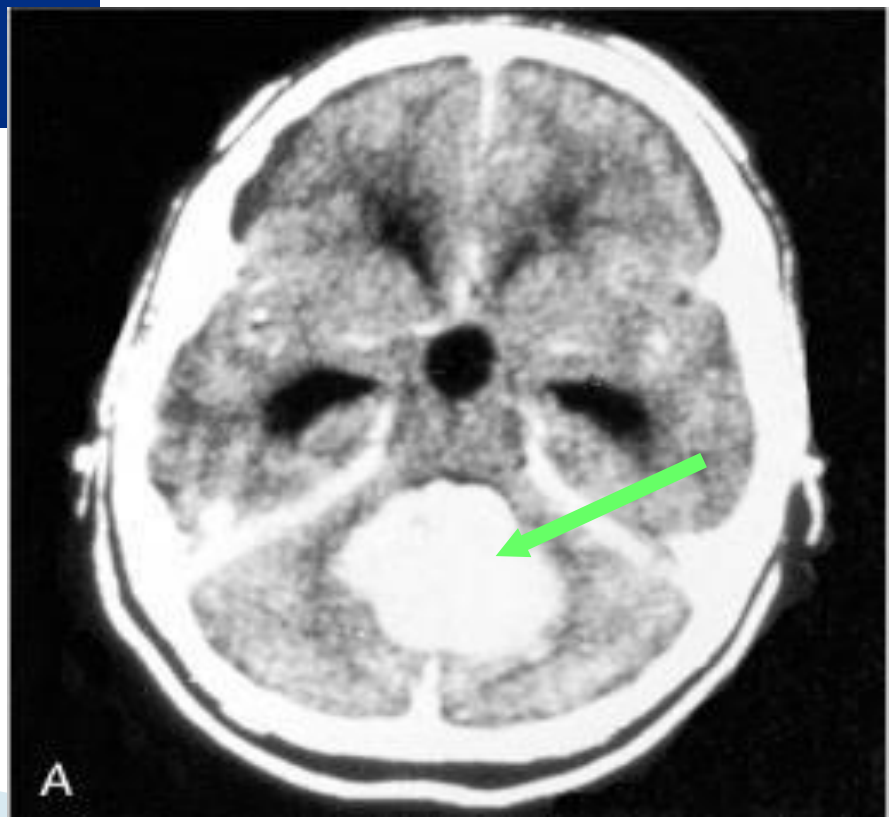
- A primitive neuroectodermal tumor (**PNET**) composed of undifferentiated small blue round cells.
- **20**% of pediatric brain tumors:
  - Children → Midline cerebellum or roof of 4th ventricle.
  - Young adults → Lateral cerebellum.
- Manifests with hydrocephalus & ↑ICP early.
- Spread through CSF.

Sheet #2

	Medulloblastoma	Ependymoma
*age	- Smaller age groups.	-Young adults.
*The location	-Children · Midline cerebellum or roof of 4th ventricle. -Young adults · Lateral cerebellum.	- <20 yrs · 4th ventricle ->20 yrs · Spinal cord
*Under the microscope	- undifferentiated small blue round cells.	- Looks like a little normal Ependyma but columnar appearance.(كلام الدكتورة)

But they are both aggressive and grow quickly.





Medulloblastoma

Microscopic:

- Cellular tumor composed of small blue round cells with numerous mitoses & **Homer - Wright Rosettes.**

Most of them are nuclei.

Genetics:

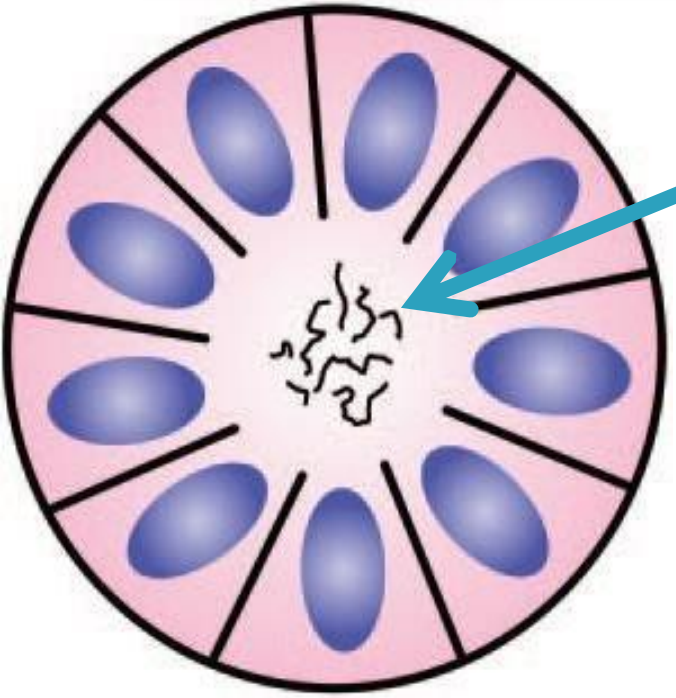
- MYC amplification (bad Px).
- WNT mutation (good Px).
- Sonic hedgehog (?).

Prognosis & treatment:

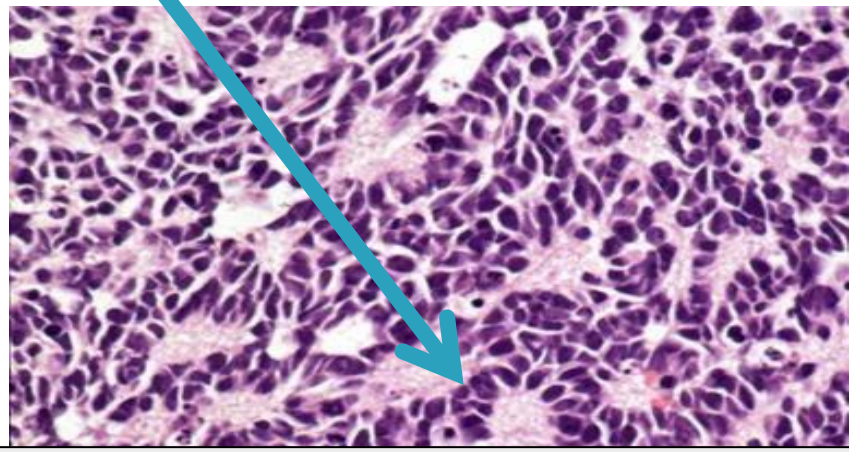
- Without treatment → very poor.
- With treatment (since it is radiosensitive) → 75% 5-year survival rate (BUT!!!).

الأطفال الي بيتعالجوا لازم ينحطوا تحت المراقبة ونكون منتبهين عليهم + انهم لو ما تعالجوا رح يموتوا.

These cells present with high-grade Medulloblastoma have a lot of necrosis and need to be treated.

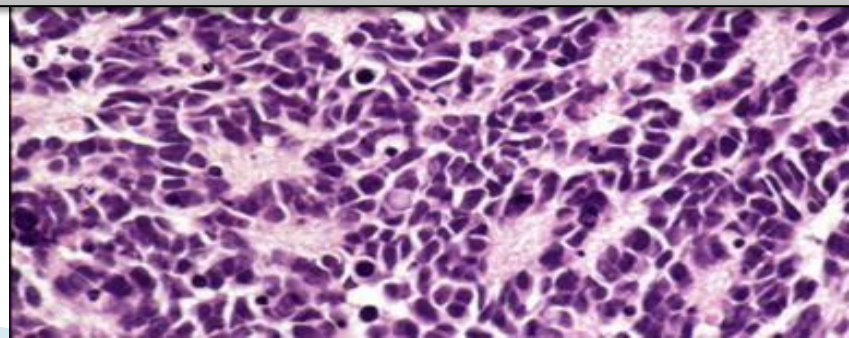


Neurofibrillary center



The cell consists of dark stained nuclei

Homer Wright R. in Medulloblastoma



Meningioma

- Arise from arachnoid meningiothelial cell on surface of brain or spinal cord.

> – Outside the brain (duralbased) (dura بال ملتصق) +Make a mass and Pressure on the brain+ make invasion in very rare causes+(grade 1 to 3 (Not4))

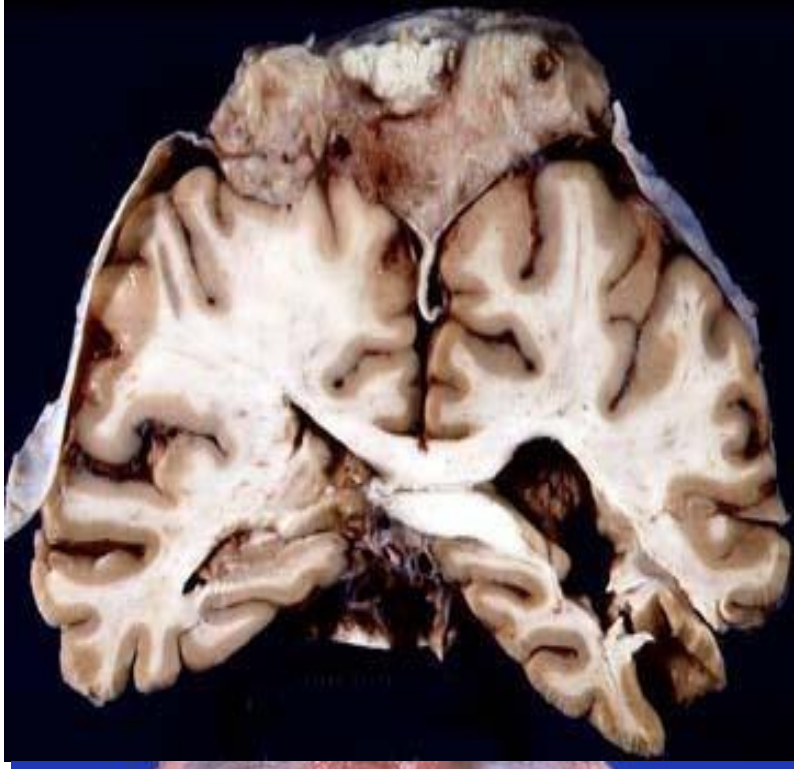
- Sites: Parasagital (Falx), sphenoid….
- Most in adult females → Tumor cells contain PROGESTERON receptors.
- 50% are associated with NF2 mutation.

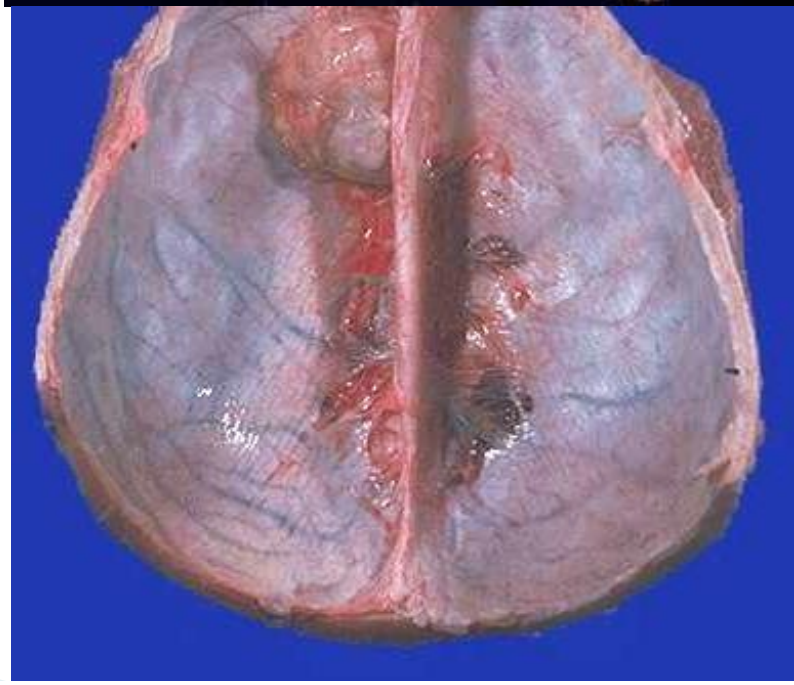
Gross:

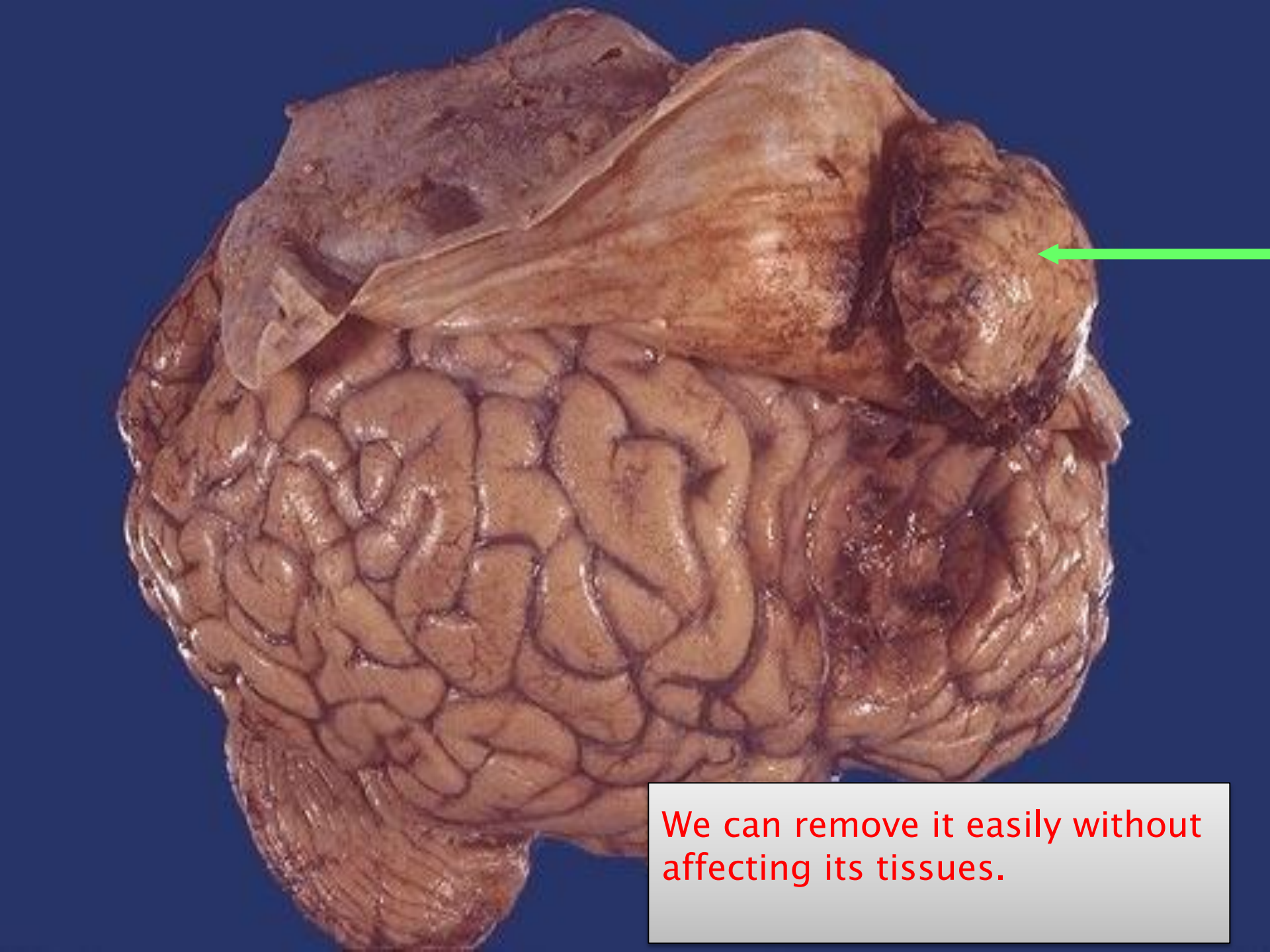
- Well defined solid Dural based mass → Compressing brain but easily removed.

– Not attach with brain +No invasion with brain

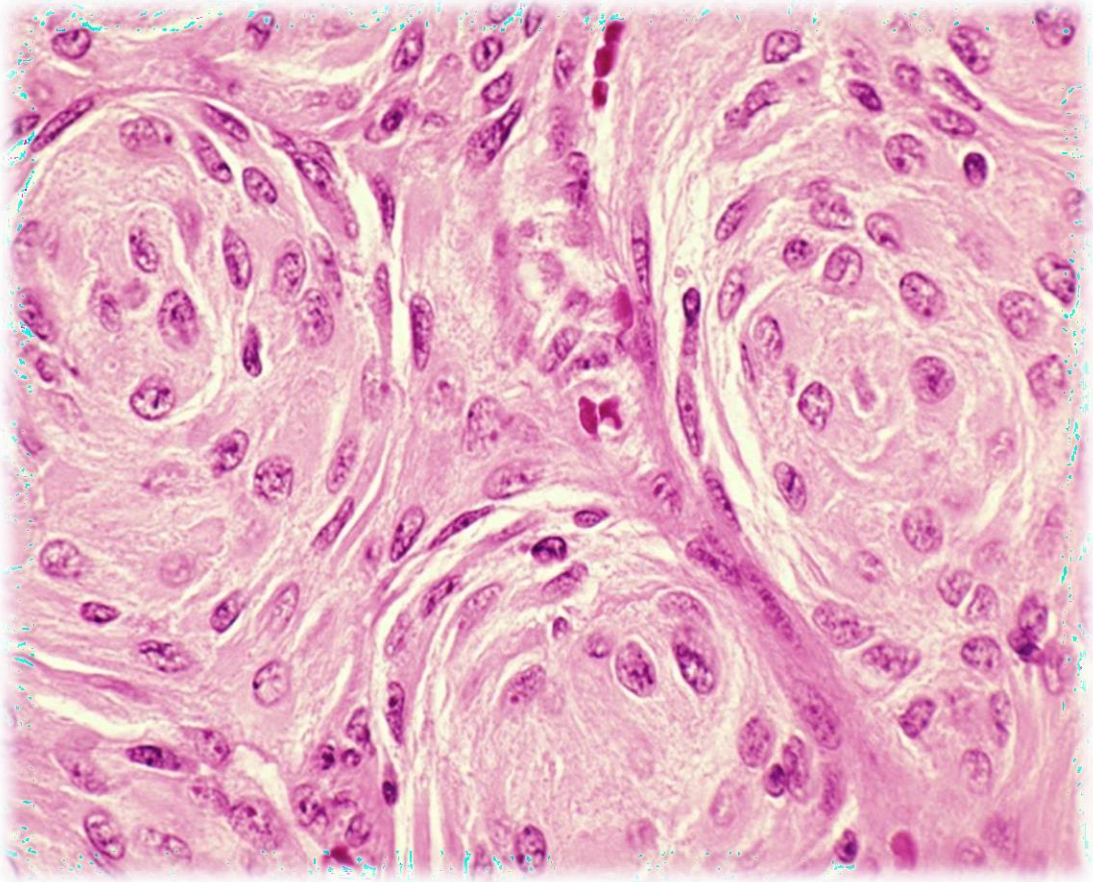
- Can invade the skull & venous sinuses, but this does not affect prognosis.
- Can invade the underlying brain → **IMPORTANT** in prognosis



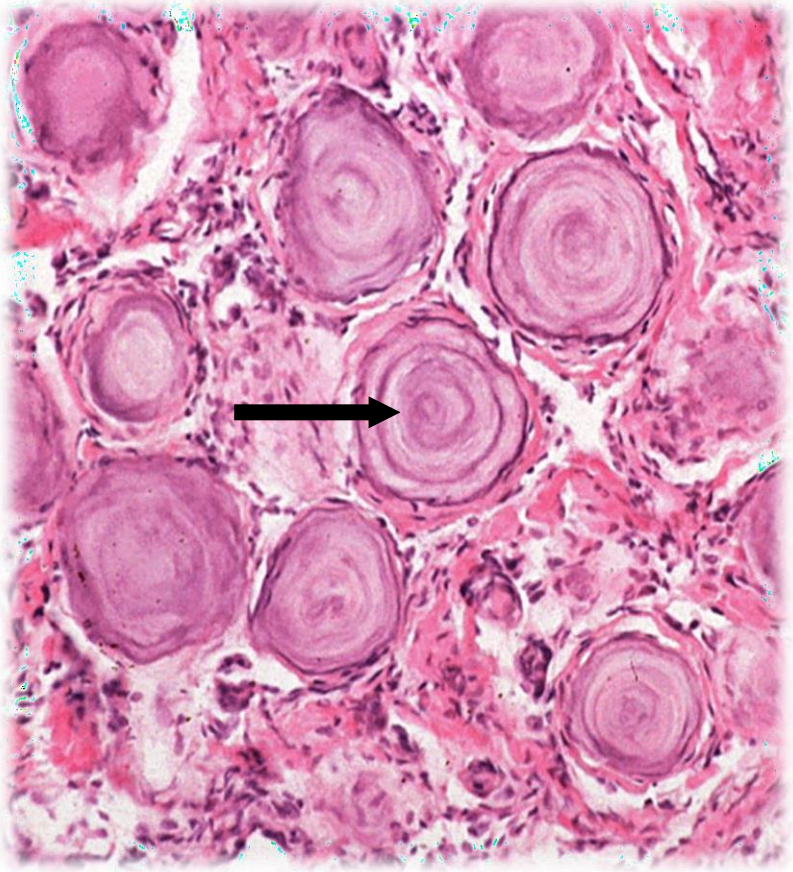




We can remove it easily without affecting its tissues.



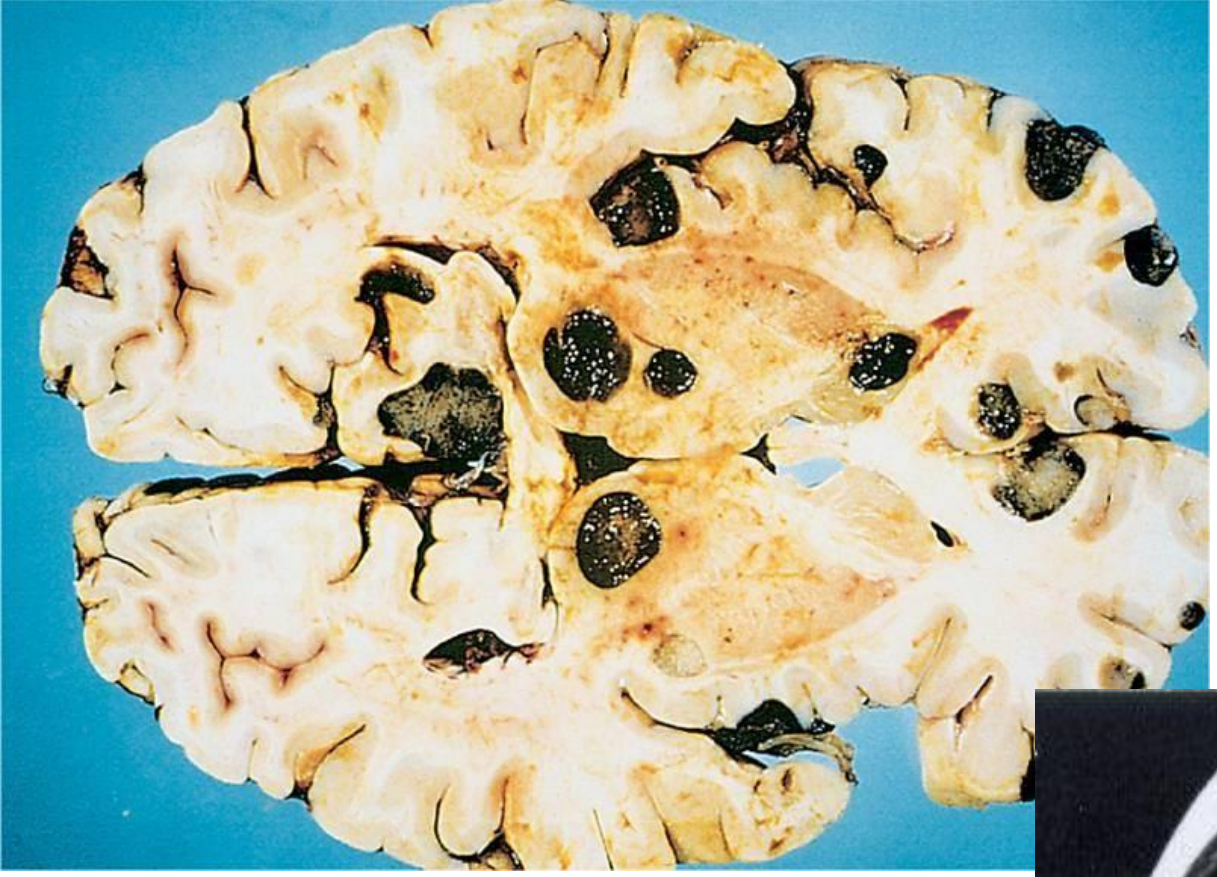
No mitosis

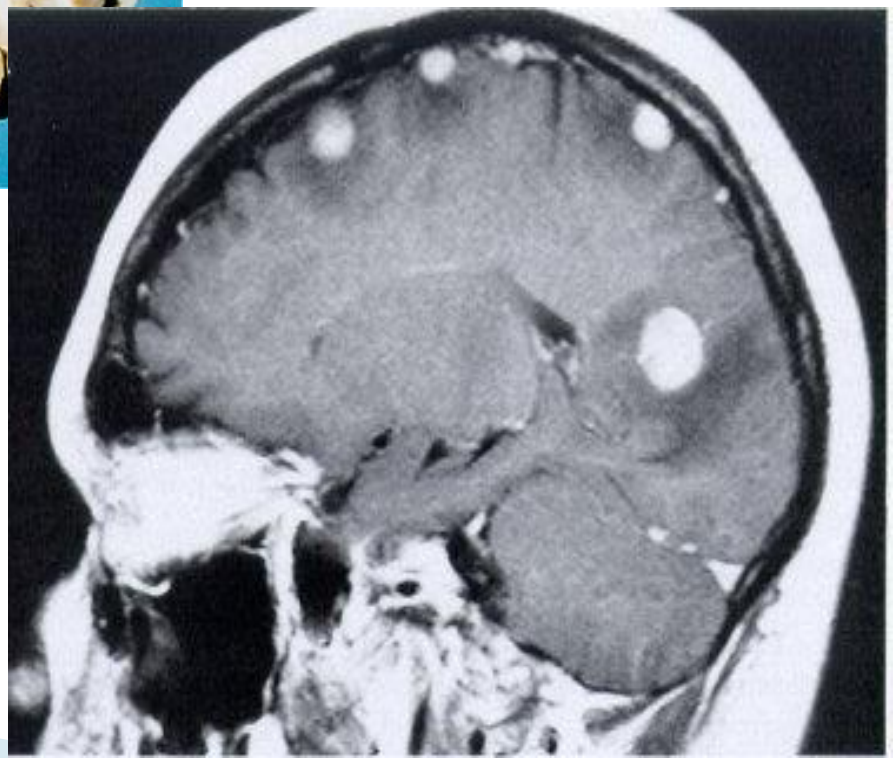


Psammoma bodies are diagnostic of meningiomas in brain tumors

Metastatic CNS tumors

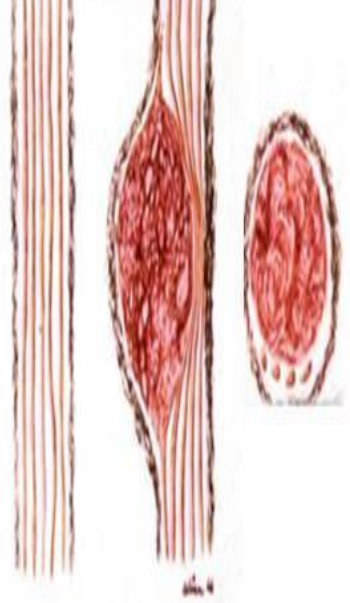
- Majority are **CARCINOMAS** disseminate via blood → forming multiple sharply demarcated masses at Grey-white matter junction OR at border zone between MCA and PCA with marked surrounding edema.





- Origin of solid primary tumors:
  - Lung (most common)
  - Breast
  - Melanoma
  - Kidney
  - Gastrointestinal
- Less common but with special propensity for brain metastasize:
  - Germ cell tumours
  - Thyroid

Spinal Cord tumors :



- Extraspinal: Metastatic, Lymphoma
- Extradural intraspinal : Metastatic, Lymphoma
- Intradural :

  Extramedullary : Schwannoma

  Meningioma

  Intramedullary : Ependymoma

  Astrocytoma

Sheet #3

- **Extraspinal**: outside of the brain+ compressed on the spinal.

-**Extradural intraspinal**: inside the spinal canal +out of the Dural.

-**Intradural** :Out the spinal fibers (Extramedullary).

Tumours of Peripheral Nervous System :

- Majority are composed of cells that show evidence of Schwann cell differentiation.

1. Schwannoma.
2. Neurofibroma.

benign

3. Malignant peripheral nerve sheath tumor (MPNST).

- Although majority arise along the course of a peripheral nerve, few arise close to the brain, mainly schwanoma at cerebellopontine angle.

They are usually solitary , but may be multiple in the Familial Tumor Syndromes (NF).

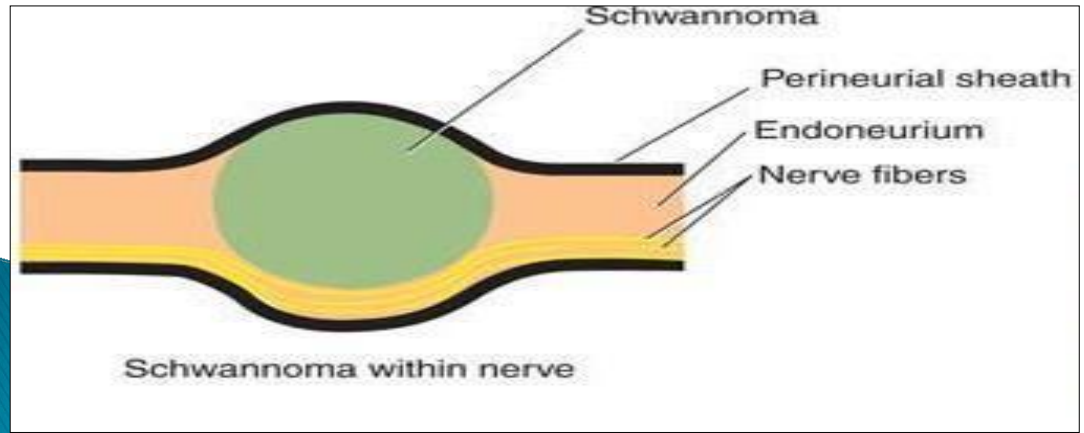
Schwannoma

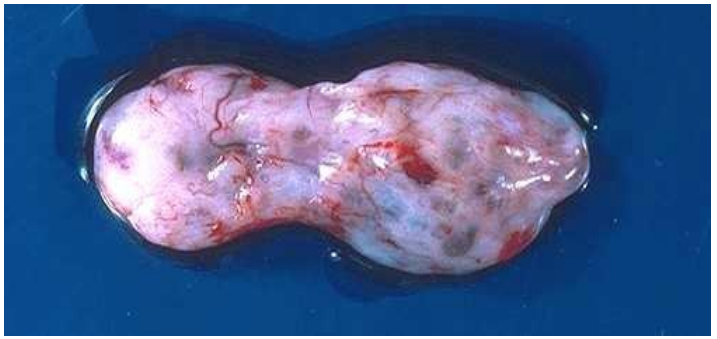
Benign tumor.

Can be sporadic (ass. with NF2 gene mutation) or familial (Neurofibromatosis-2).

Gross:

- Encapsulated masses that abut the associated nerve without invading it.
- -(compression without invasion).



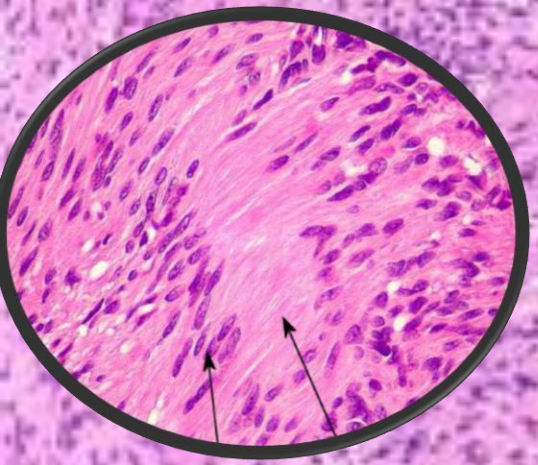


Antoni A: "Palisaded"

"Verocay" bodies

Benign

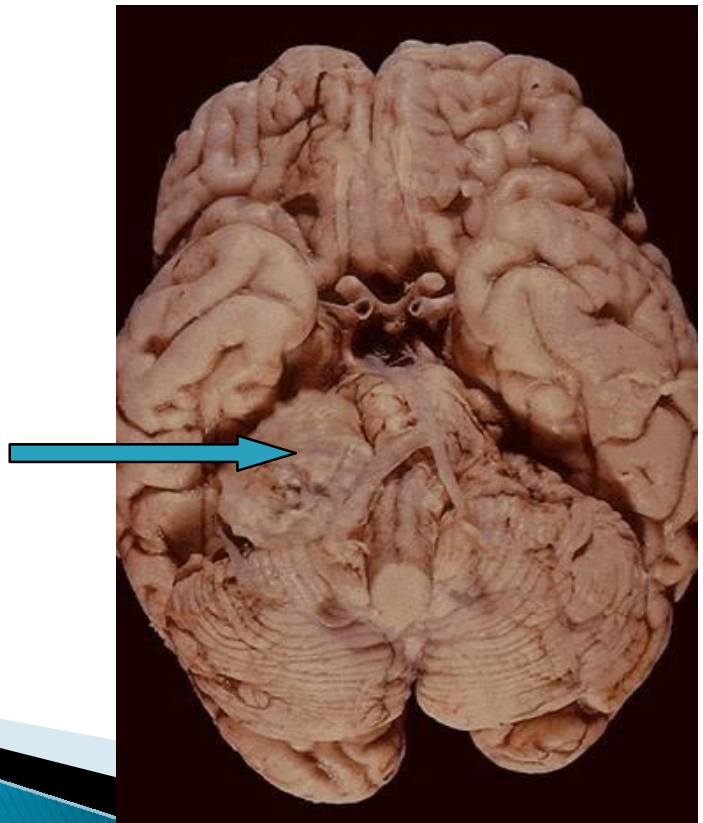
Less cells



Antoni B: NON-Palisaded

More cells

- Clinical features:
- Related to nerve compression.
- Acoustic neuroma:
  - Schwannomas occur at the cerebellopontine angle leading to tinnitus & hearing loss.

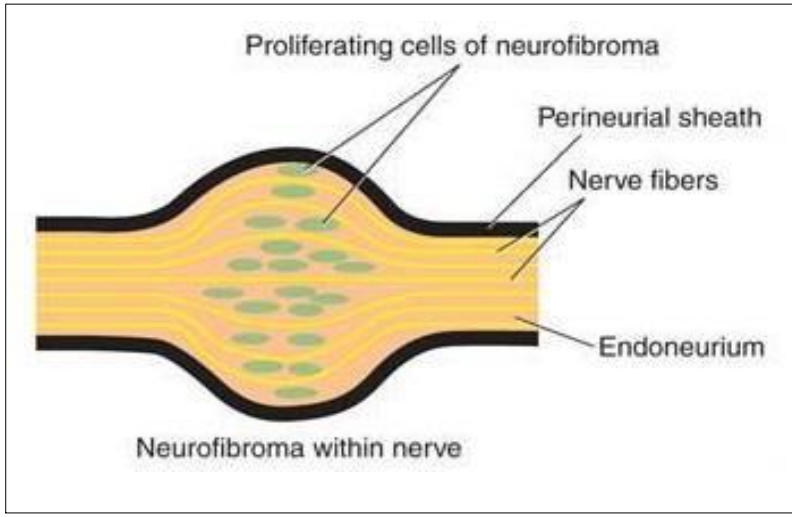


Neurofibroma

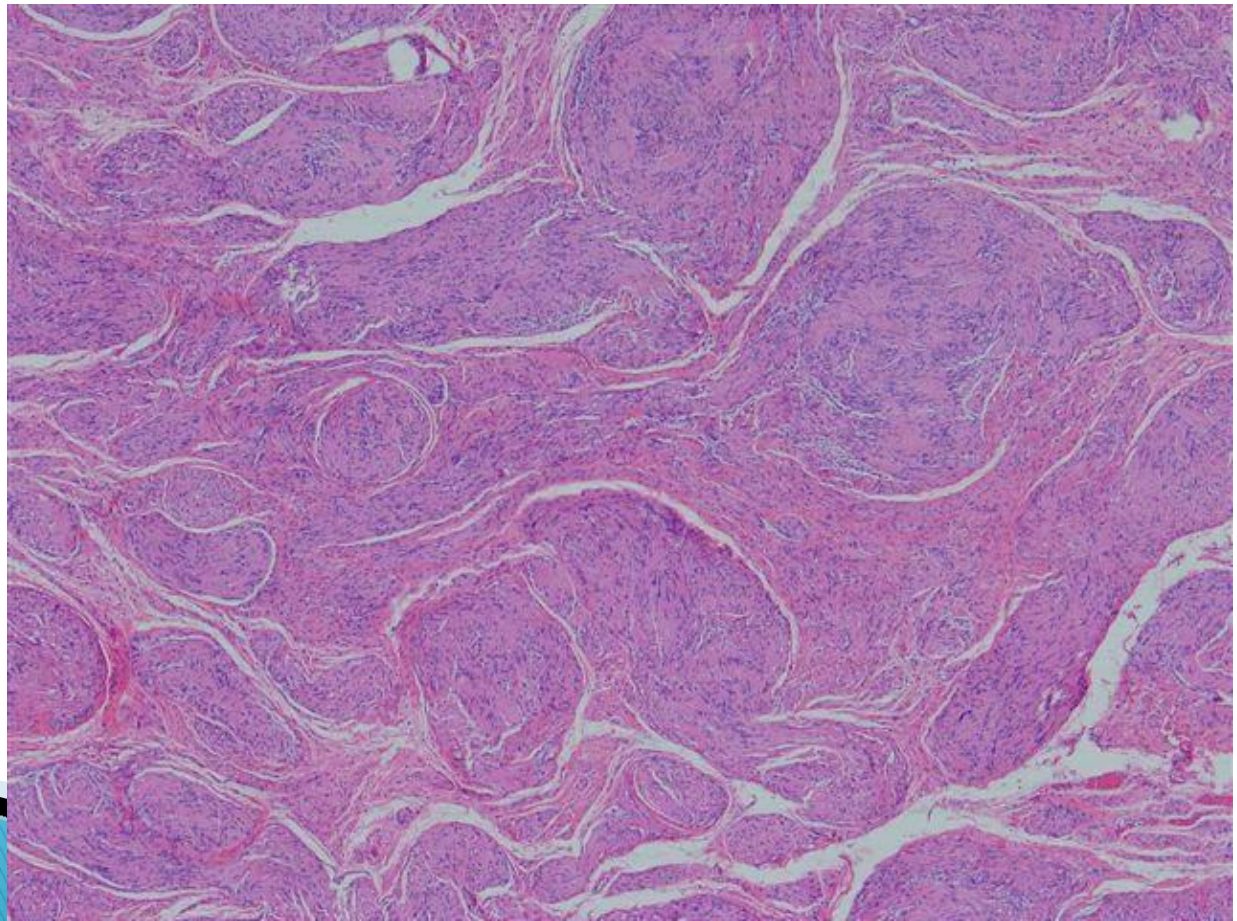
- Benign tumor composed of neoplastic Schwann cells admixed with perineurial- like cells, fibroblasts, mast cells …
- Can be sporadic (ass. with NF2 gene mutation) or familial (Neurofibromatosis-1).

1. Superficial cutaneous neurofibromas.
2. Diffuse neurofibromas
3. Plexiform neurofibromas:
   → Has the highest risk to transformed into MPNST

MPNST: malignant peripheral nerve sheath tumor



- Clinical features:
  - Nodulular or diffuse lesion in skin or SC. tissue.
- Microscopic:



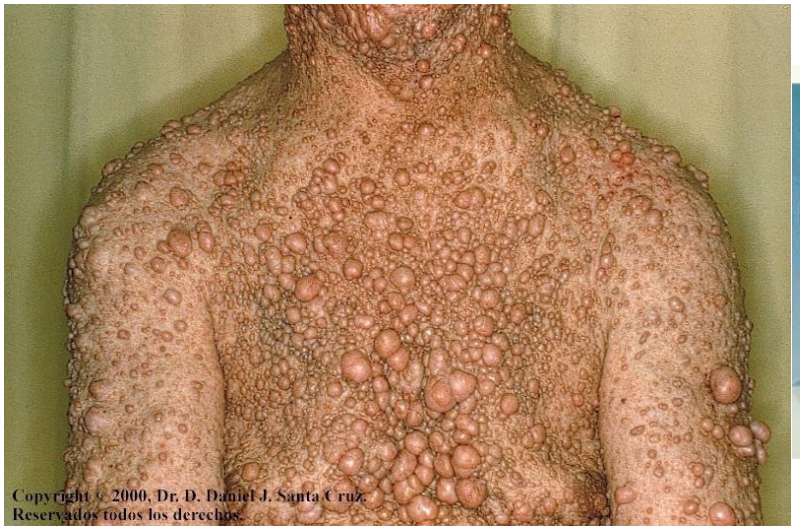
Inherited familial tumor syndromes

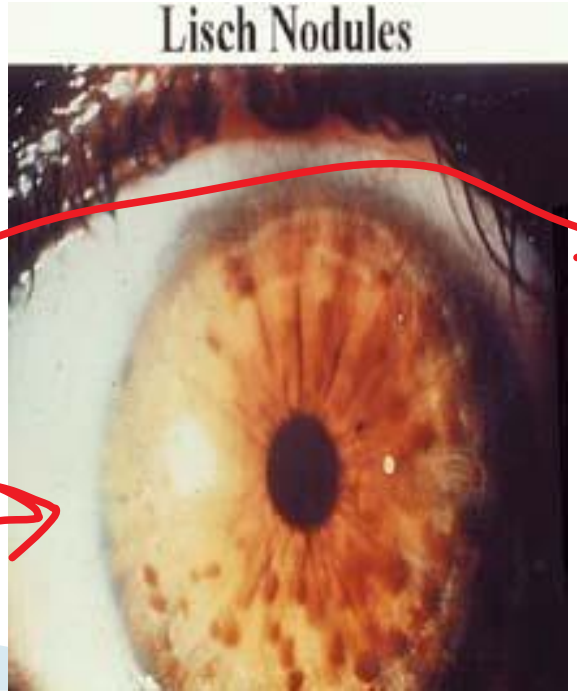
Most are **AD** disorders.

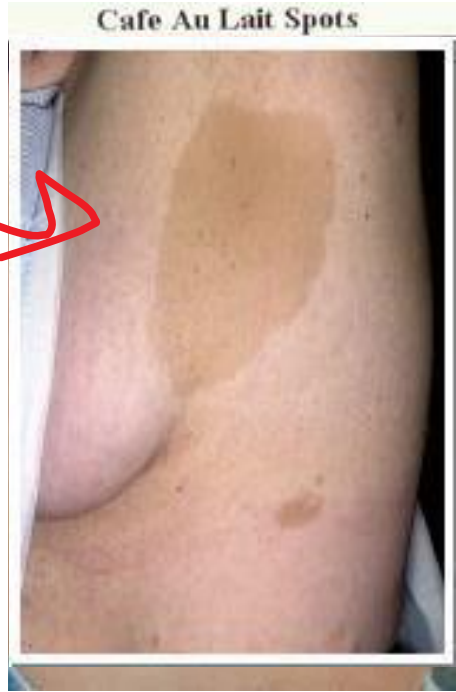
- **Neurofibromatosis Type I & Type II –**
  Variety of CNS & peripheral nerve tumors ± other systemic manifestations
- **Tuberous() sclerosis – CNS hamartomas ,astrocytoma, subependymoma (TUBERS), extracerebral lesions including benign skin lesions, renal angiomyolipoma ..etc**
- **Von Hippel-Lindau – hemangioblastoma , renal carcinoma , renal cysts .....etc**
- **Li-Fraumeni – inherited p53 mutation → glioma, many types of tumors.**

Neurofibromatosis-1

- Neurofibromas± Sarcomatous trans -formation
- Glioma of optic nerve
- Meningioma
- Café-au-lait spots
- Pigmented nodules of iris







Neurofibromatosis-2

- **Bilateral acoustic neuromas.**

(shwannoma+ less healing in both sites of earing).

- **Multiple meningiomas (more than NF1)& ependymomas.**

Thank you