MENINGEAL TUMOURS

- Primary
- Secondary

Primary tumours: MENINGIOMAS

Frequency: 15-20% all primary intra-cranial tumours

Slowly growing

Benign clinical course with possible recurrences

Age: >50 ys.

Occurrence at younger age, multiplicity and ponto-cerebellar location → Neurofibromatosis

Sex: F (particularly spinal tumours)

Symptoms: Mass effect

Focal defects

Epilepsy

Histogenesis:

- Nests of arachnoidal cell within the Dura
- Pacchioni's granules
- Parasagittal location

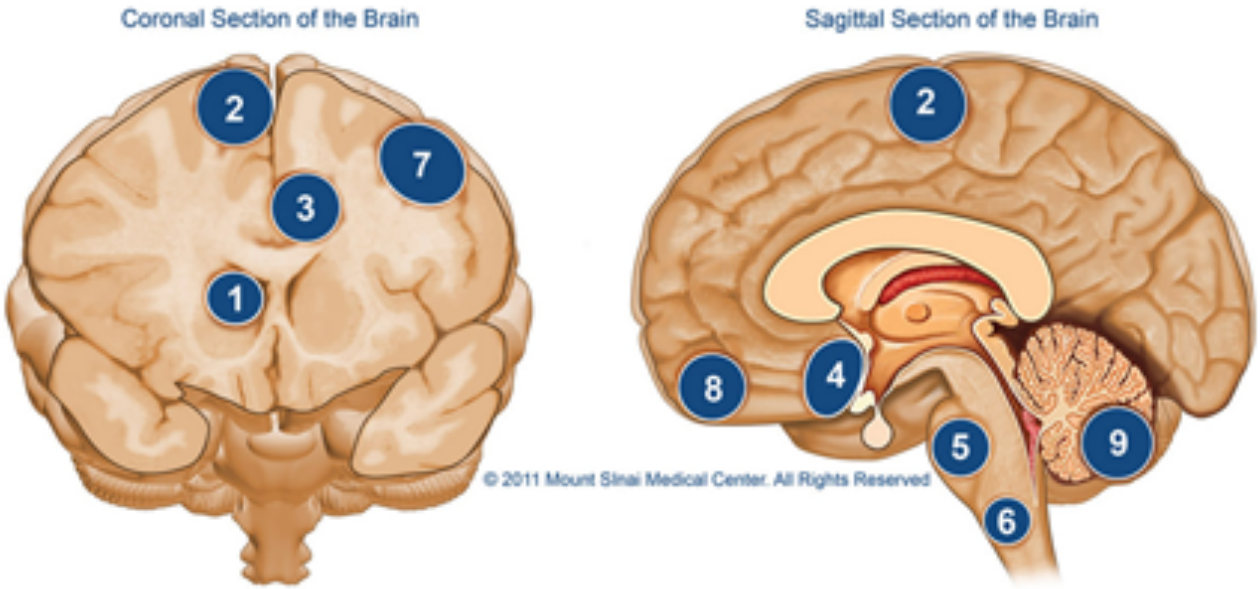
Gross:

- Size: 1-10 cm
- Colour: Whitish
  Reddish areas due to haemorrhage
  Yellow spots due to lipidization
- Consistency: Fibrous to hard, calcifications
- Gowth pattern: expansile

Localizations

- Parasagittal
- Olfactory douche
- Sphenoid wing → *carpet-like*
- Tubercle of the sella turcica
- Tentorium
- Ponto-cerebellar
- Intraventricular (from choroidal plexes)

Common Location (Types) of Meningiomas



Meningiomas are often described by their location within the brain. The most common are:

1. Intraventricular
2. Parasagittal
3. Falcine
4. Suprasellar
5. Clivus
6. Foramen Magnum
7. Convexity
8. Olfactory Groove
9. Cerebellar

Tumour expansion may cause:

- **Compression of the underlying nervous tissue**

  "*en niche*"

- **Compression of the inner cortical bone**

  Hyperostotic reaction and new bone deposition

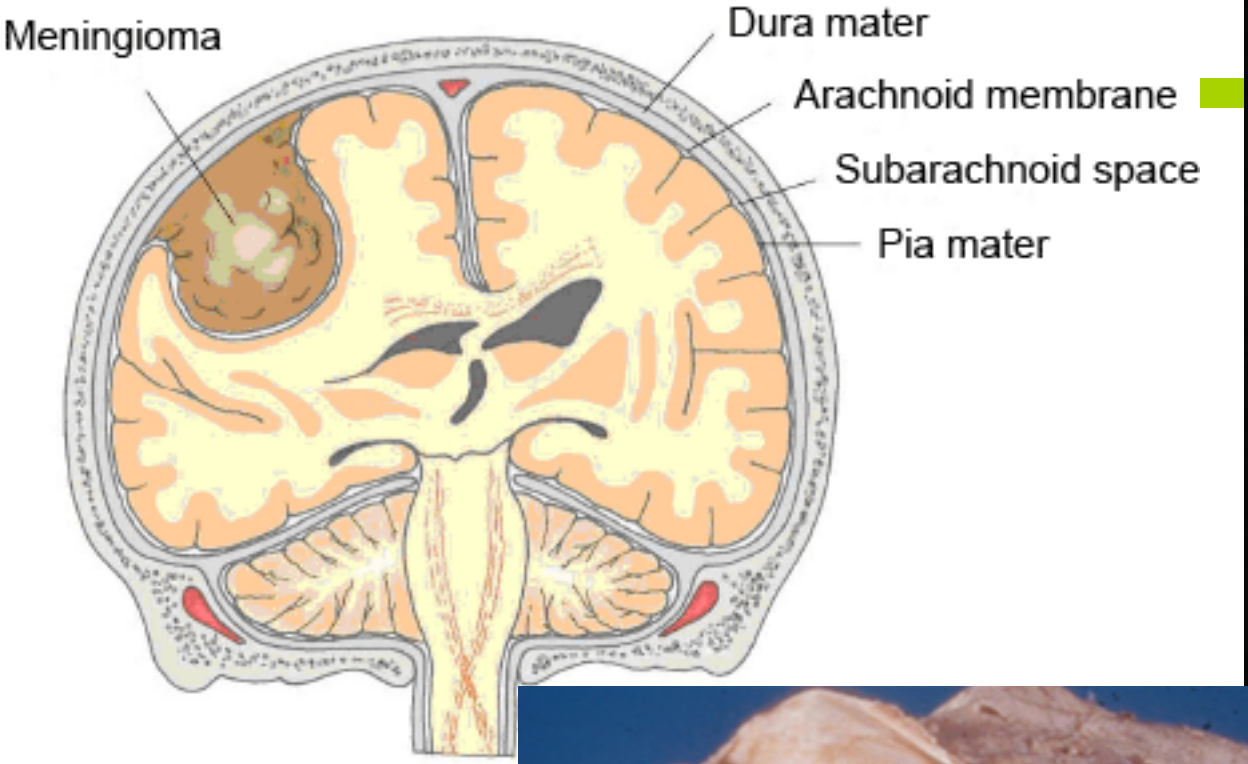
  Erosione and *pseudoinfiltration* (more rarely, invasion of adjacent soft tissues)

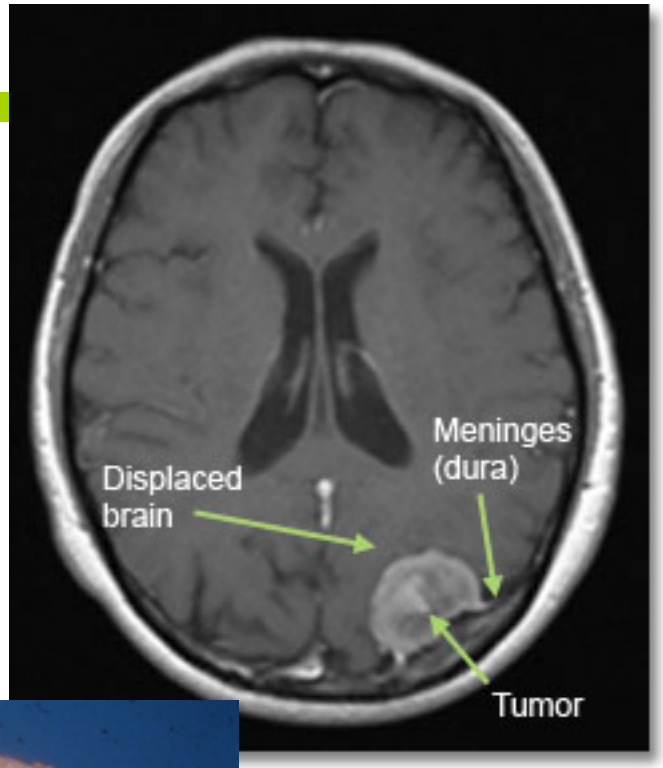
  Falx

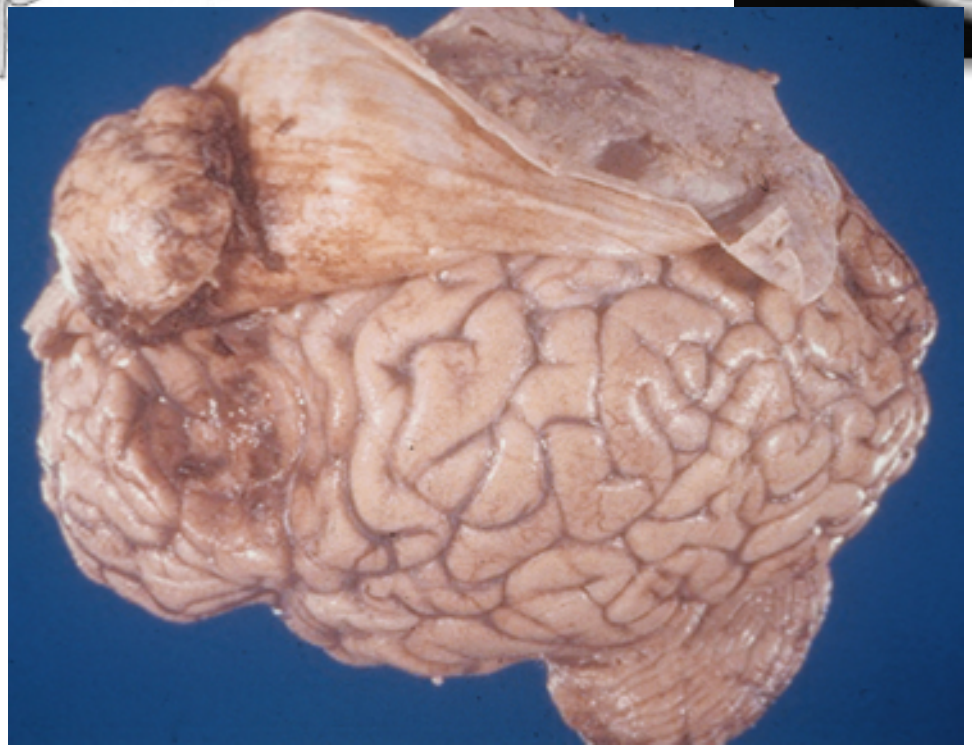
  Tentorium

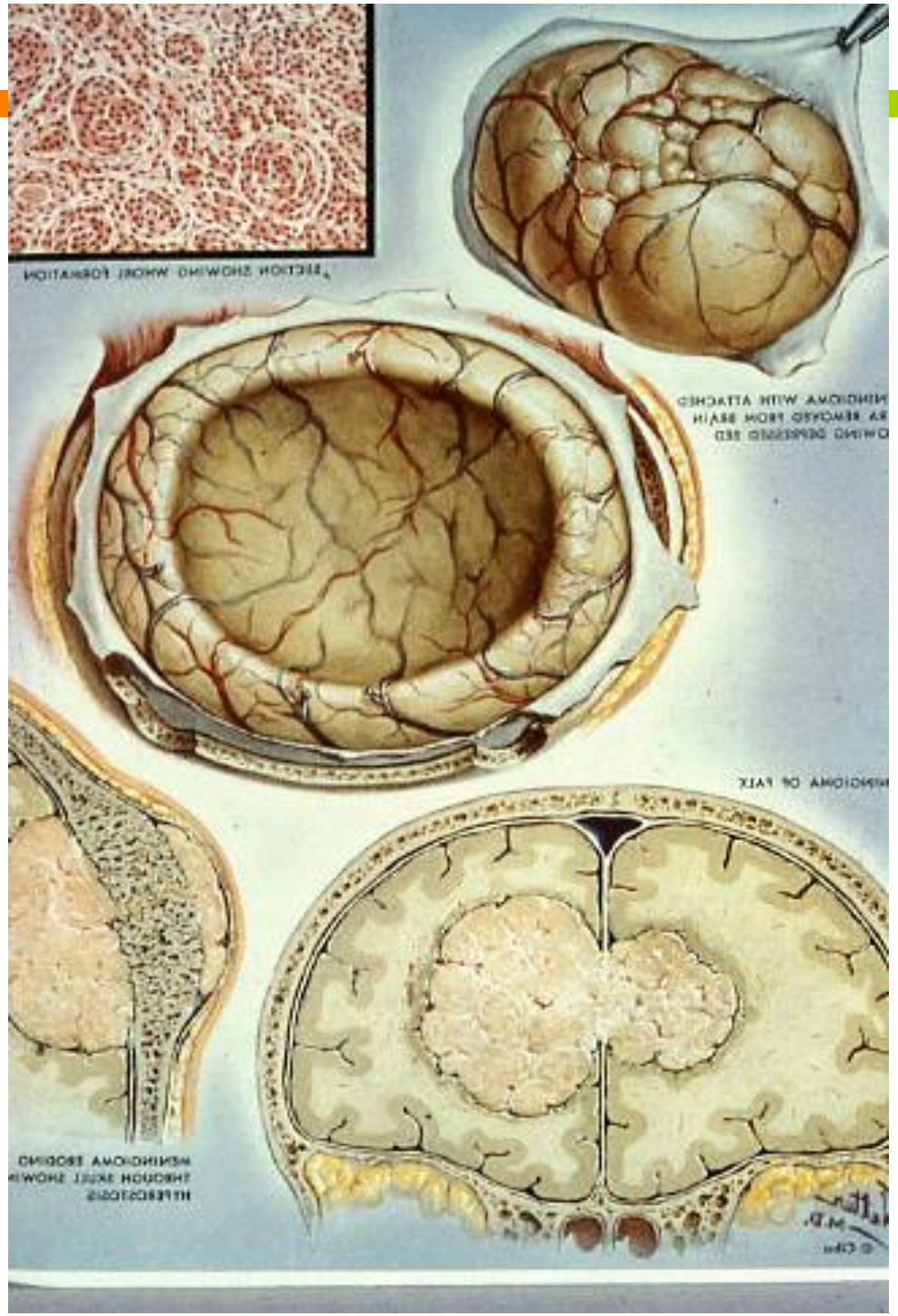
  Dural sinuses

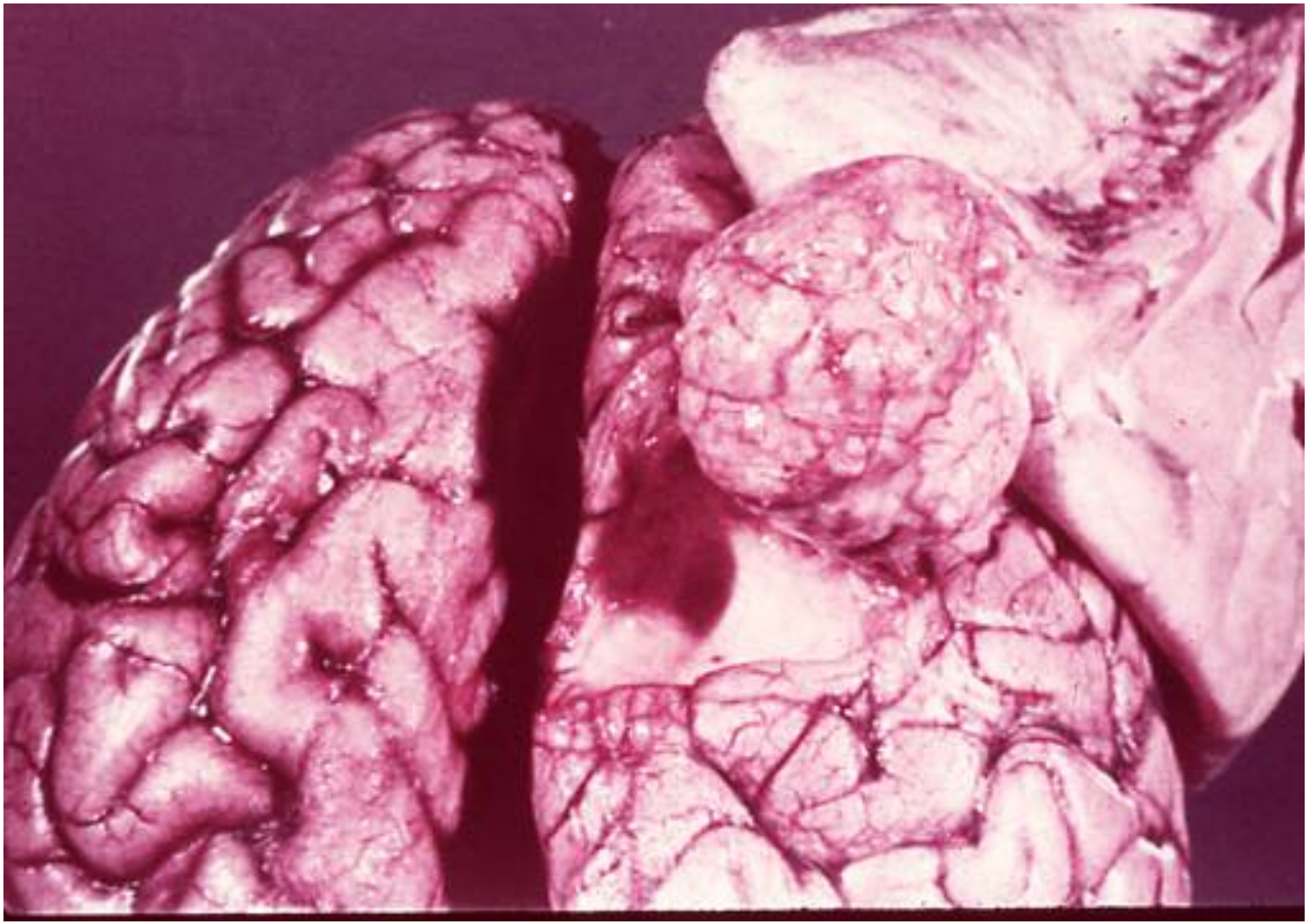
- ***En Plaque, carpet-like***

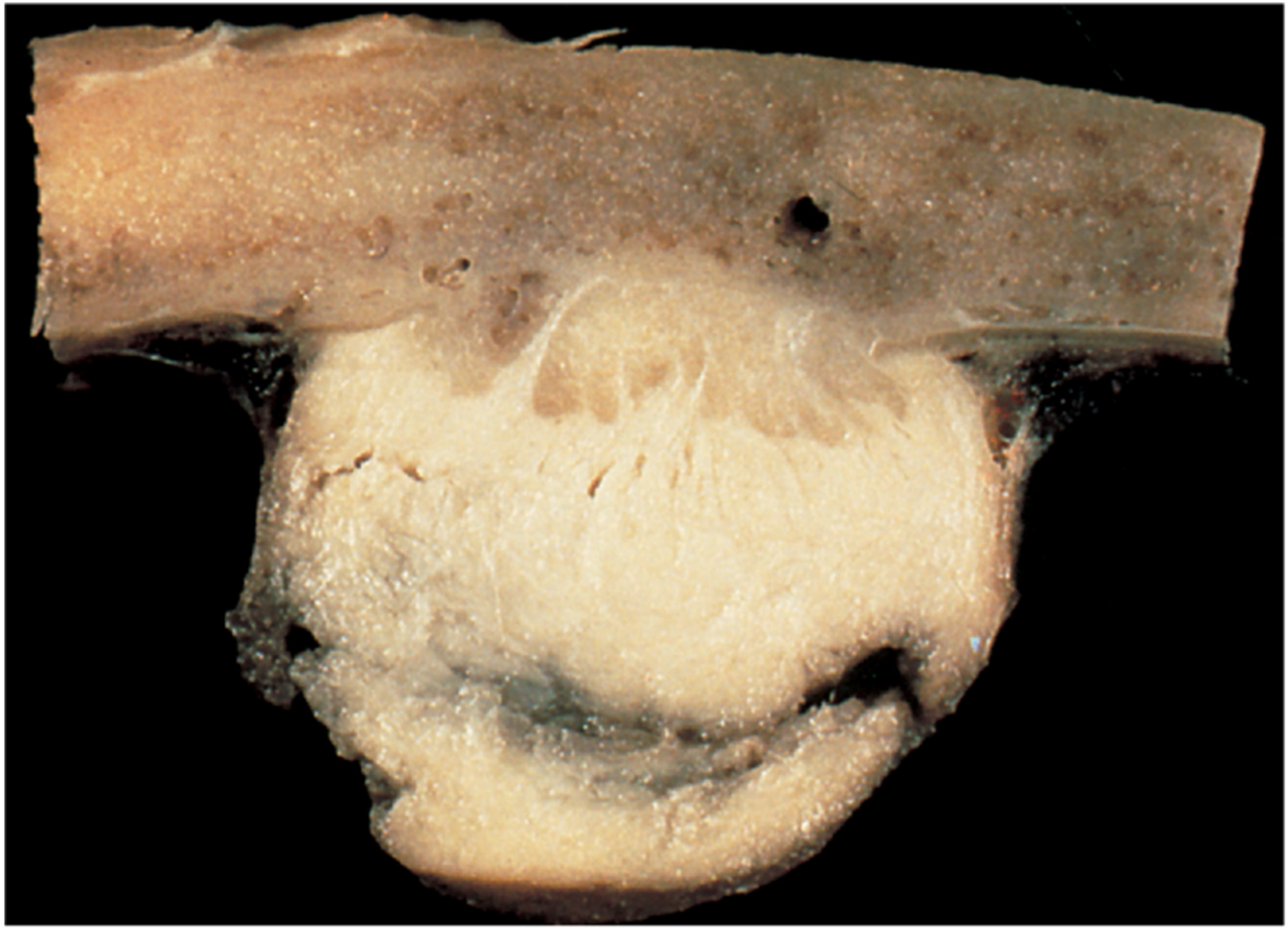

Meningioma
Dura mater
Arachnoid membrane
Subarachnoid space
Pia mater

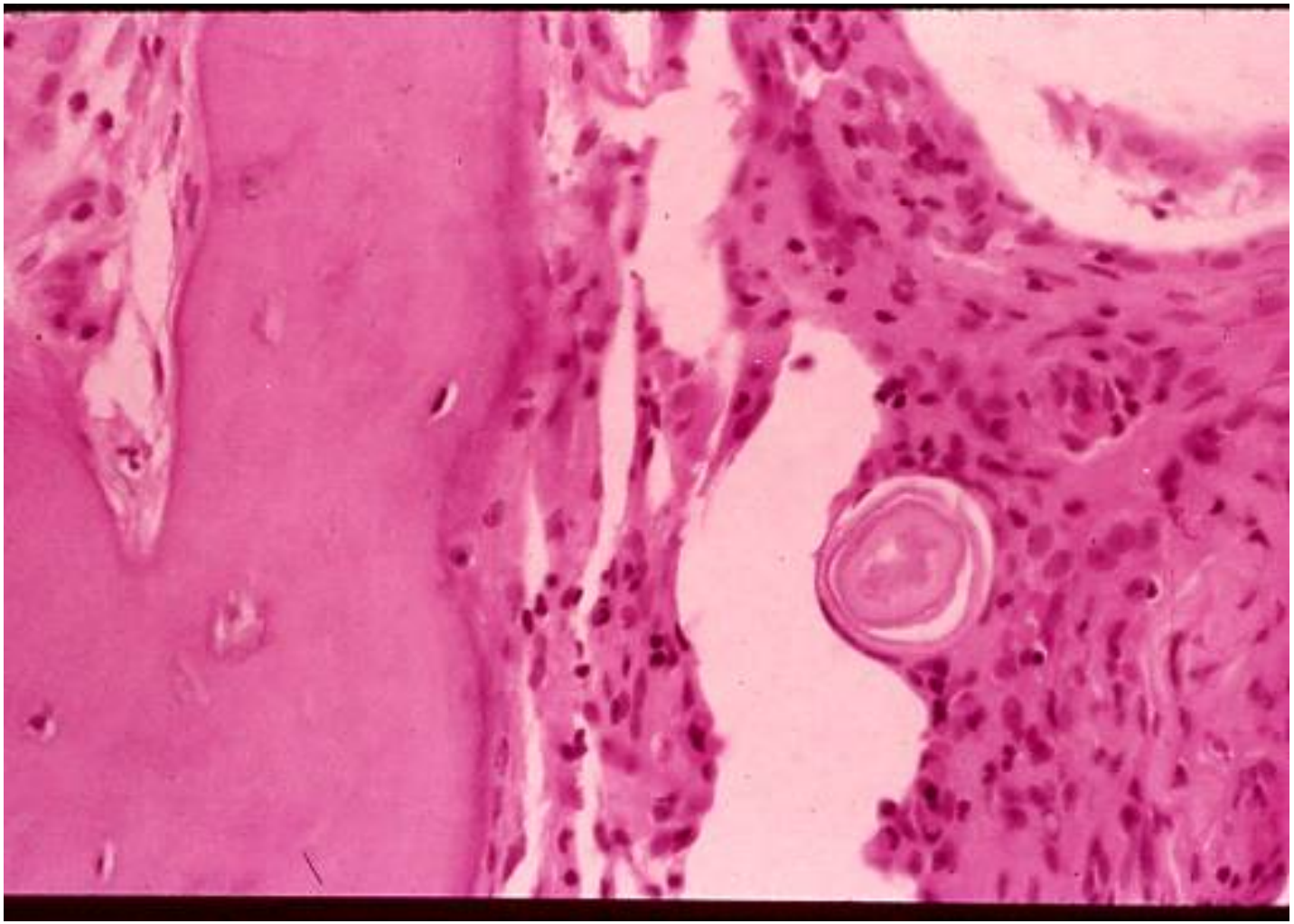

Displaced brain
Meninges (dura)
Tumor

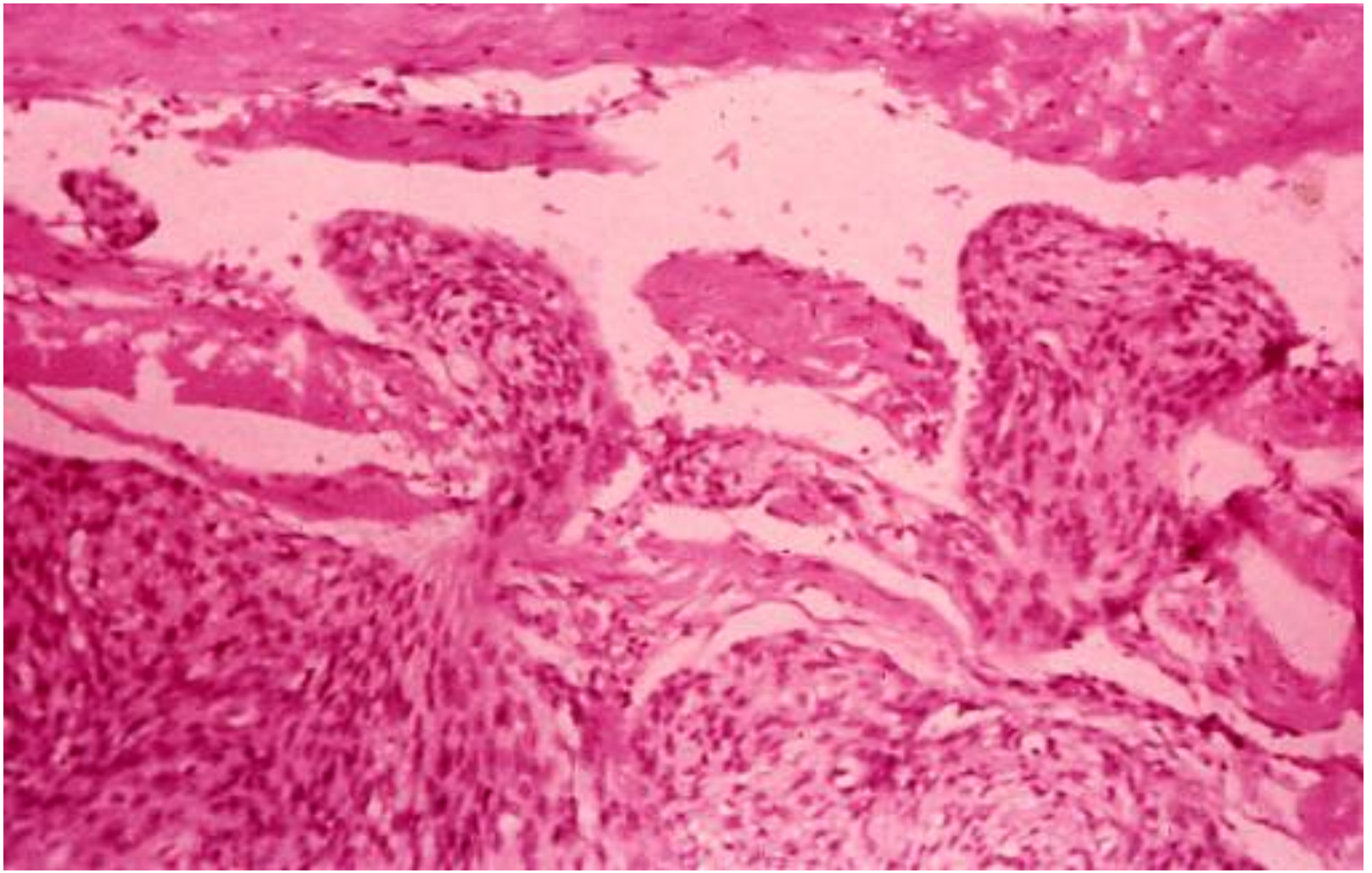




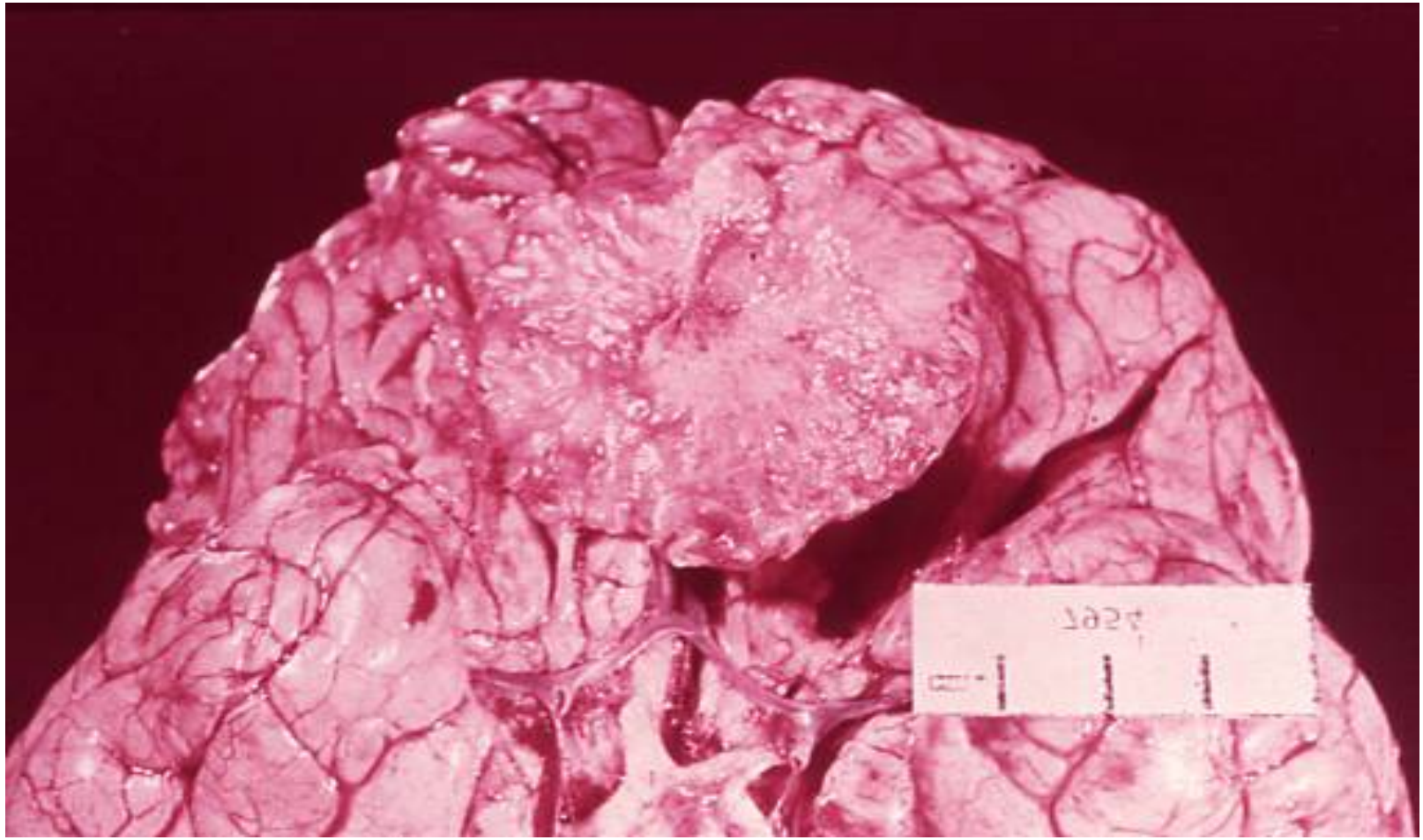


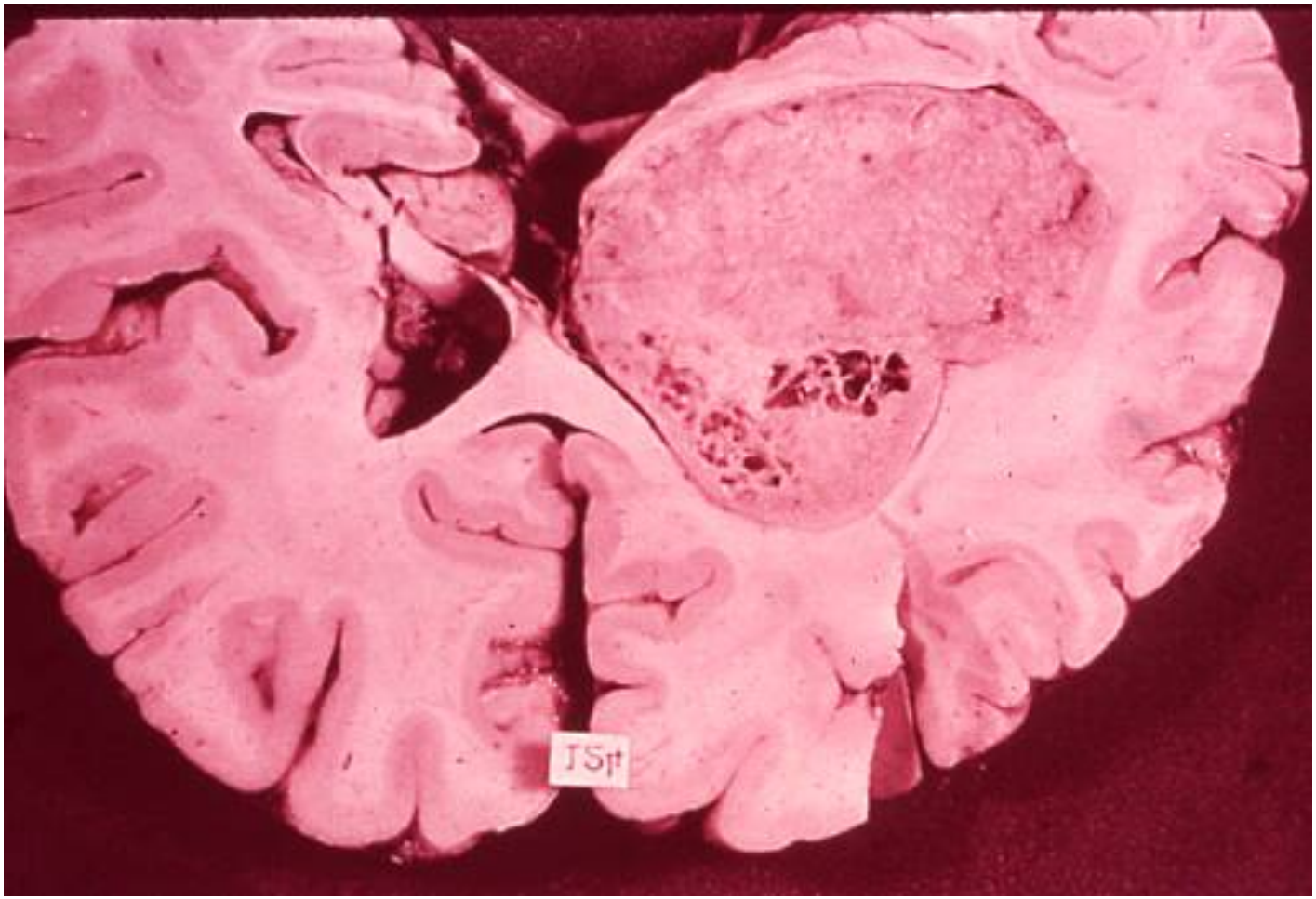


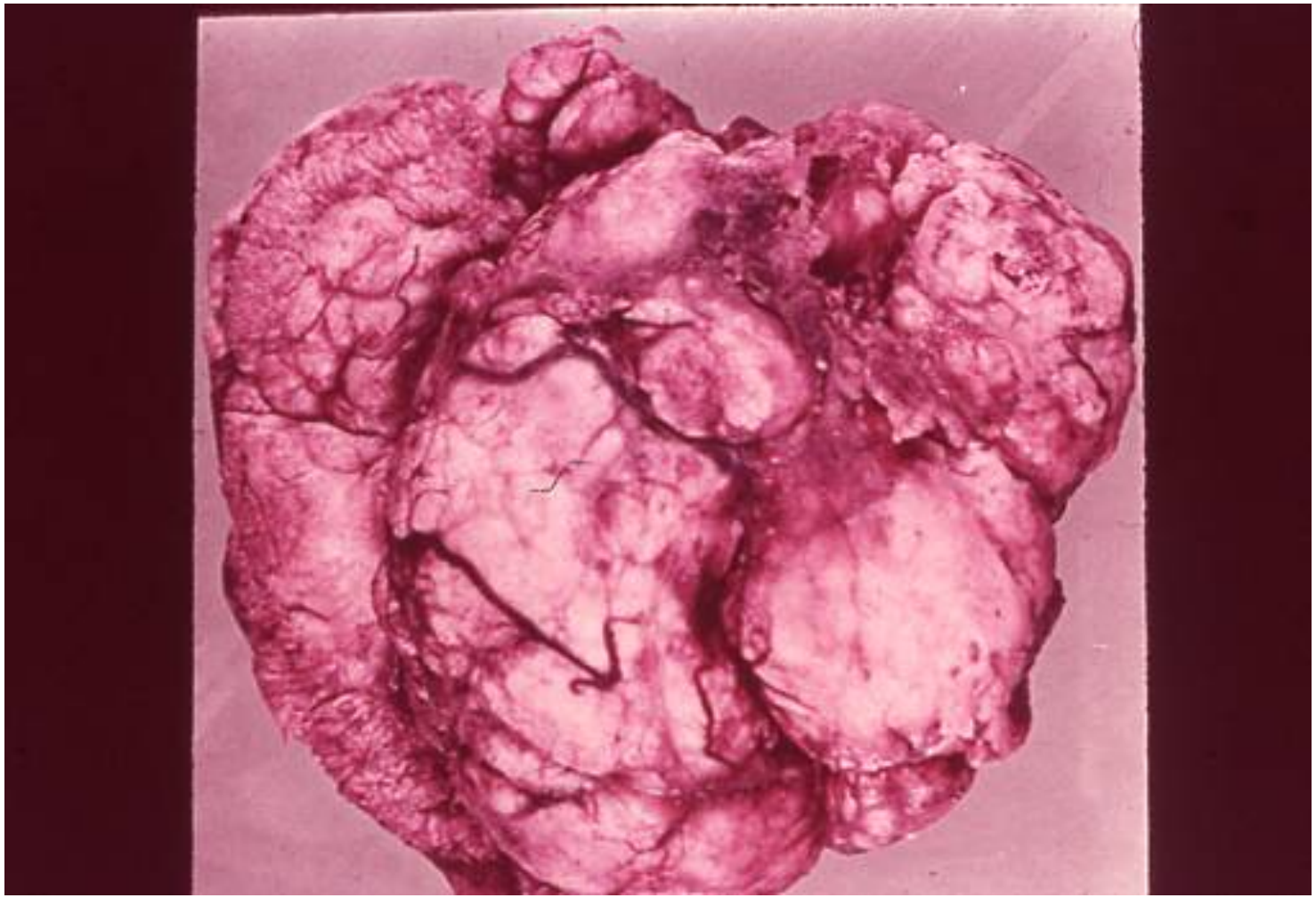


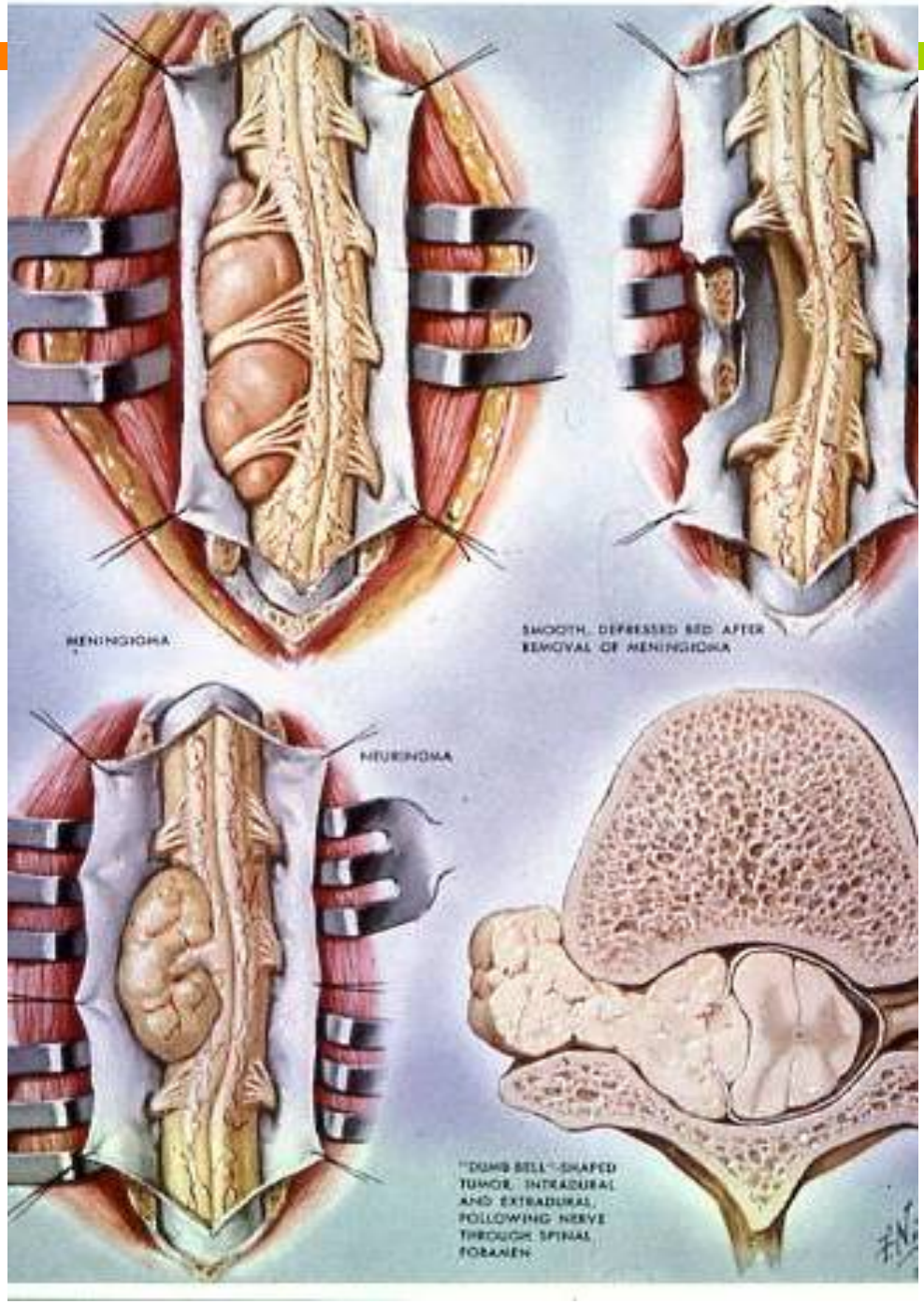


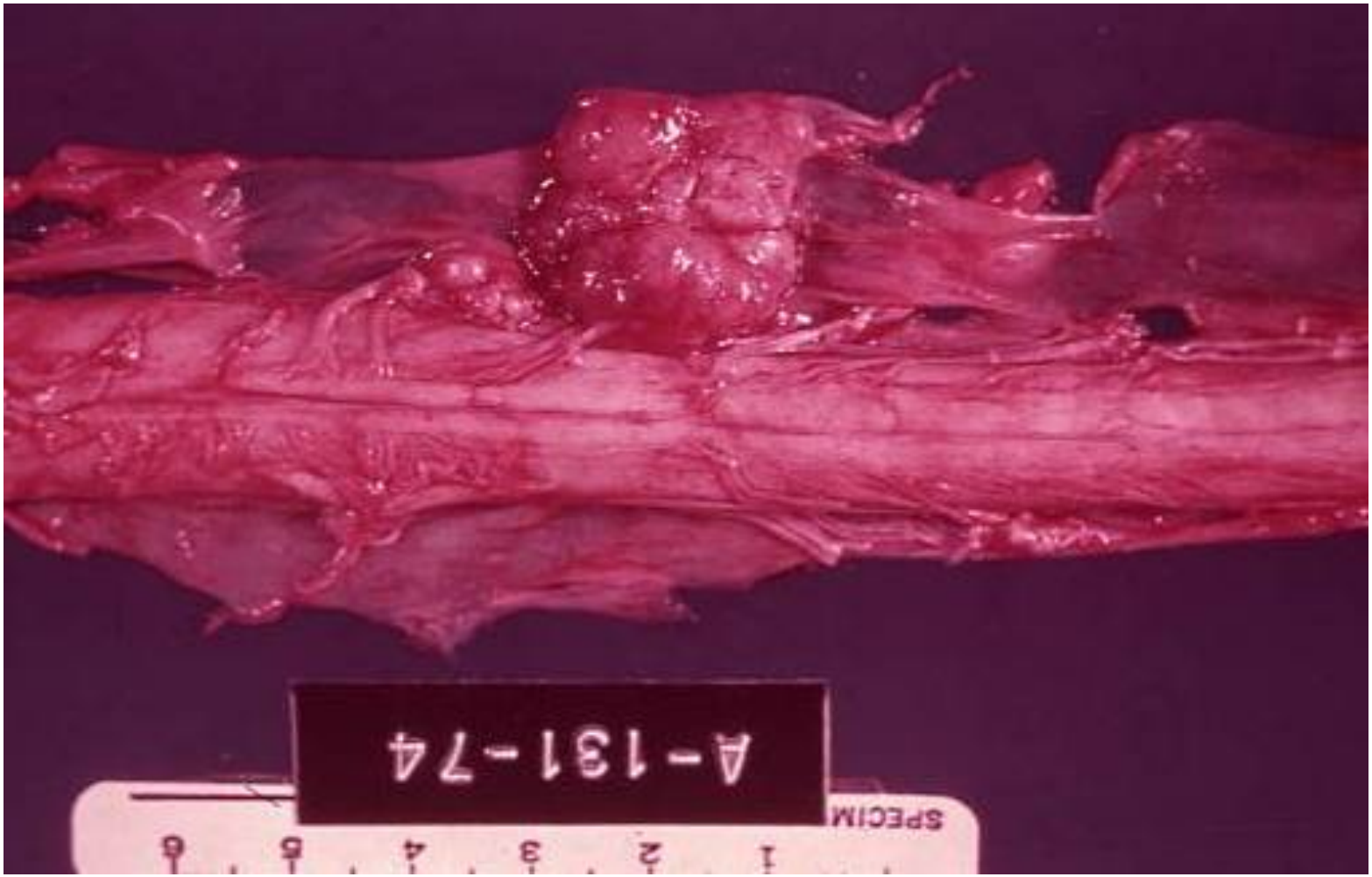
Superior sagittal sinus








MENINGIOMA
SMOOTH, DEPRESSED BED AFTER REMOVAL OF MENINGIOMA
NEURINOMA
"DUMB BELL"-SHAPED TUMOR, INTRADURAL AND EXTRADURAL, FOLLOWING NERVE THROUGH SPINAL FORAMEN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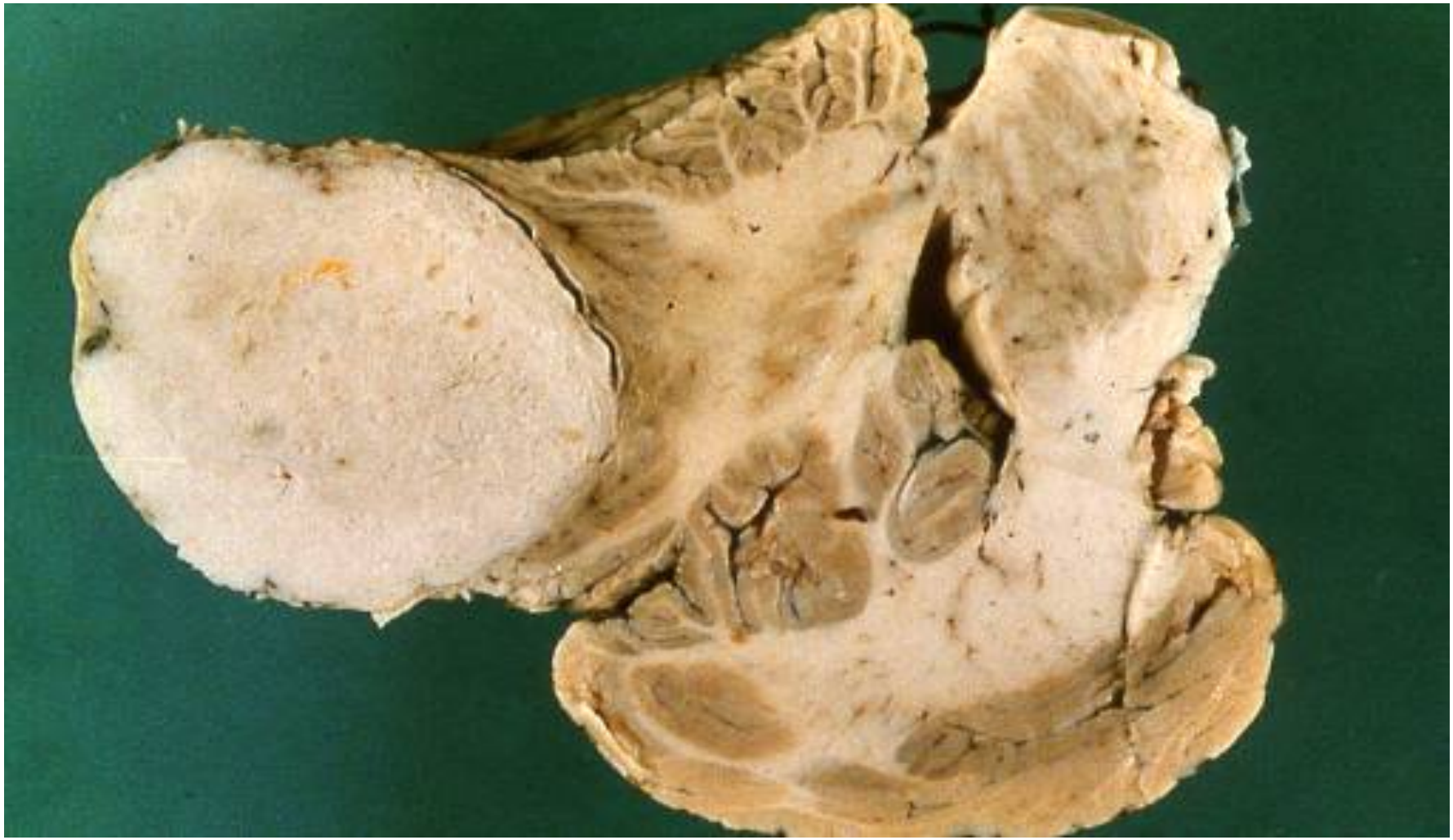


Micro patterns (EMA+, CK-):

Meningothelial (syncitial)

Lobules of meningothelial cells in a vorticoid pattern. Pseudonuclear inclusions, psammomatous bodies frequent

Fibrous

Spindle cells in elongated fasicles, in perivascular locations; intranuclear inclusions rare, sclerosis and calcifications frequent

Transitional

Intermediate between meningothelia and fibrous, with vorticoid pattern and spindle cells

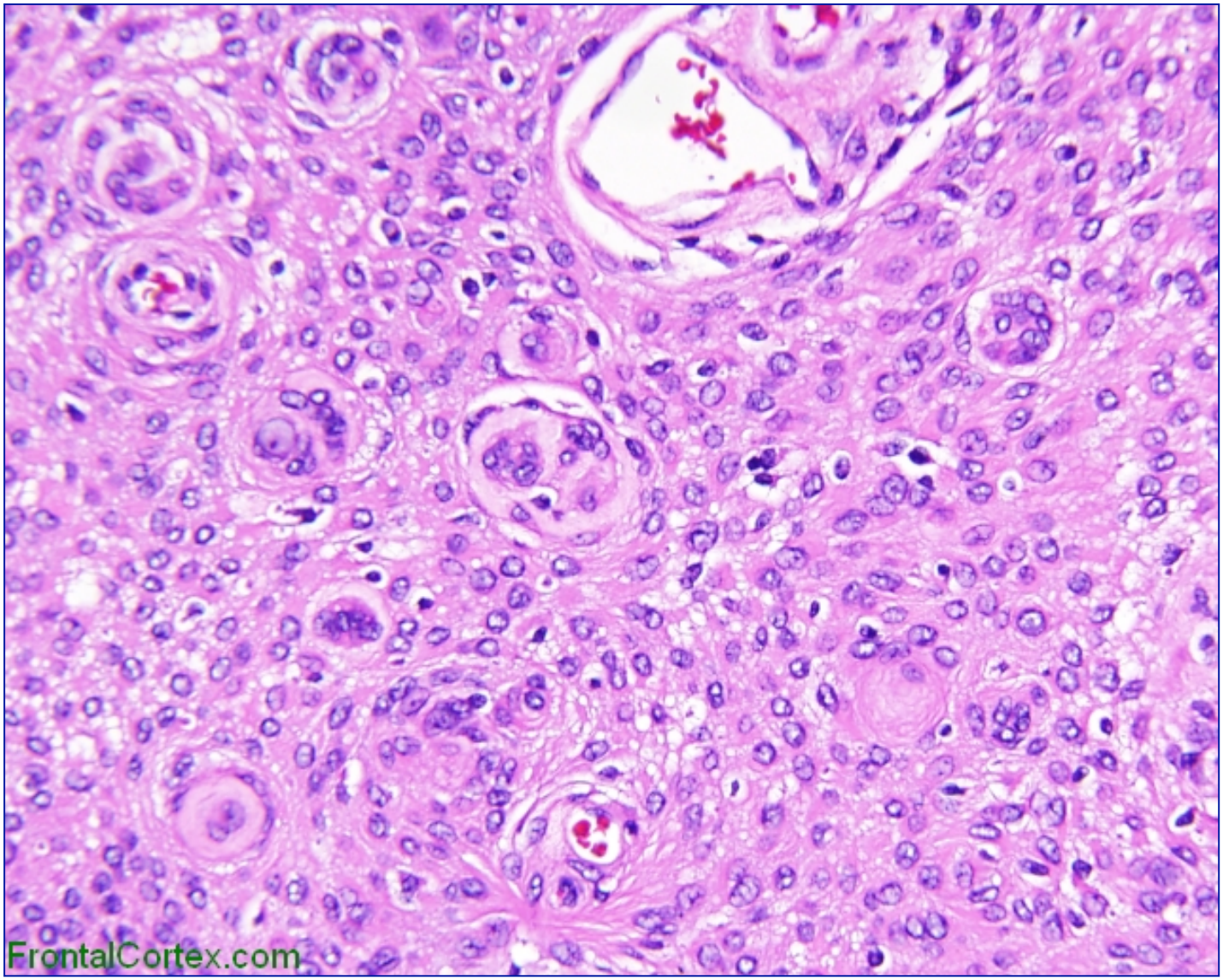
Psammomatous

Olfactory douche, spinal; vorticoid pattern, psammoma bodies and calcifications

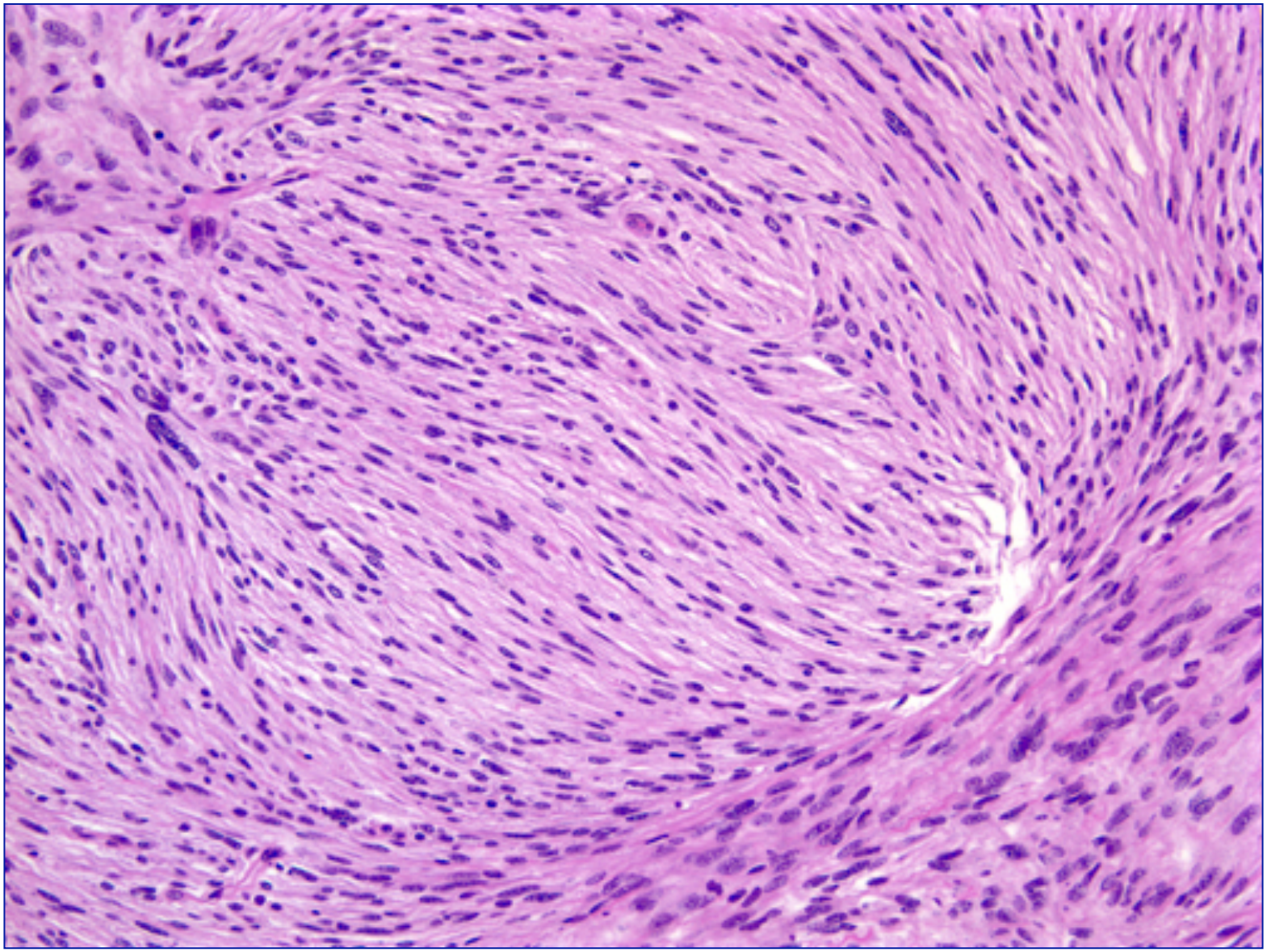
Secretory

Intra-cytoplasmic lumina with eosinophilic (PAS+) bodies

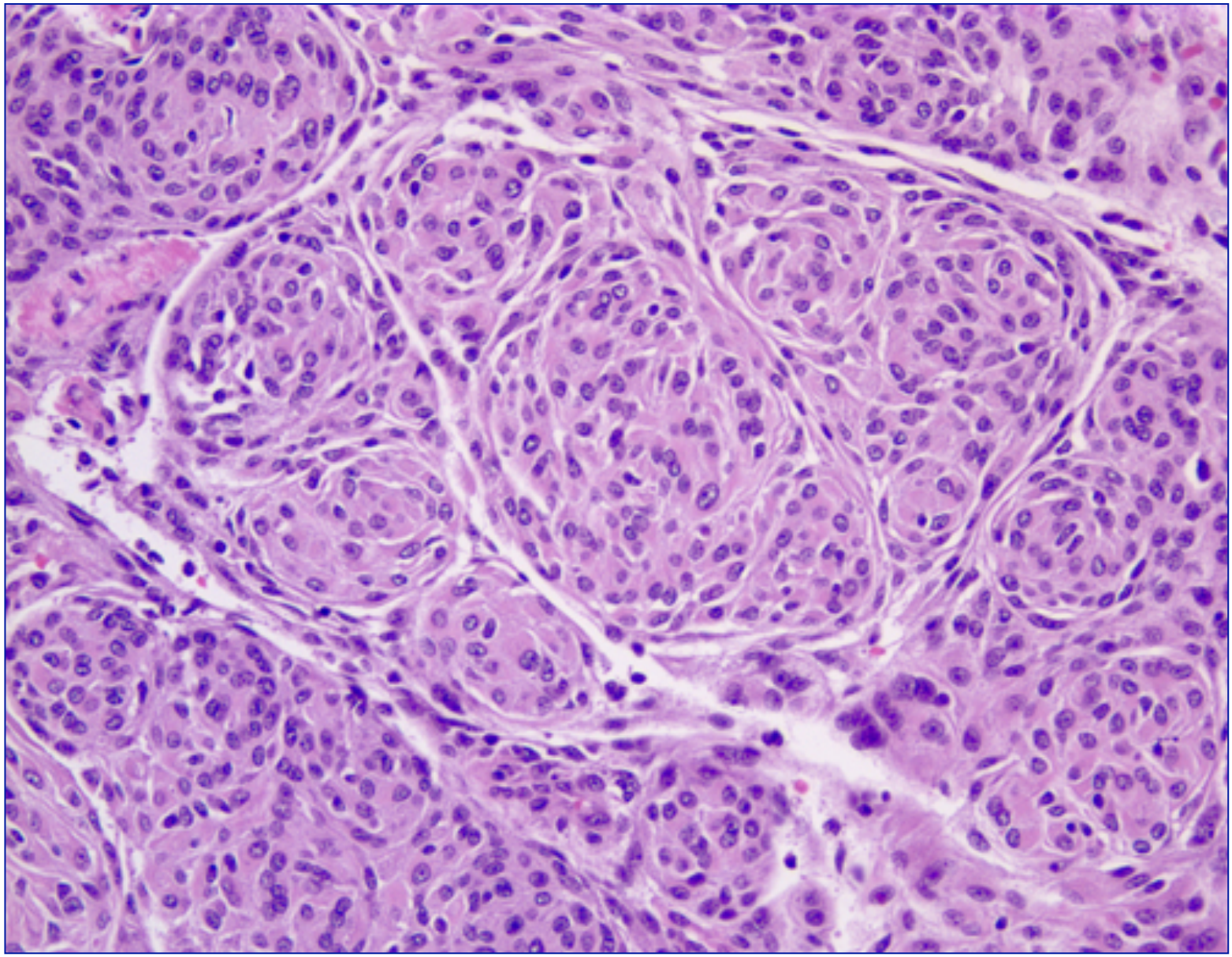
Meningothelial



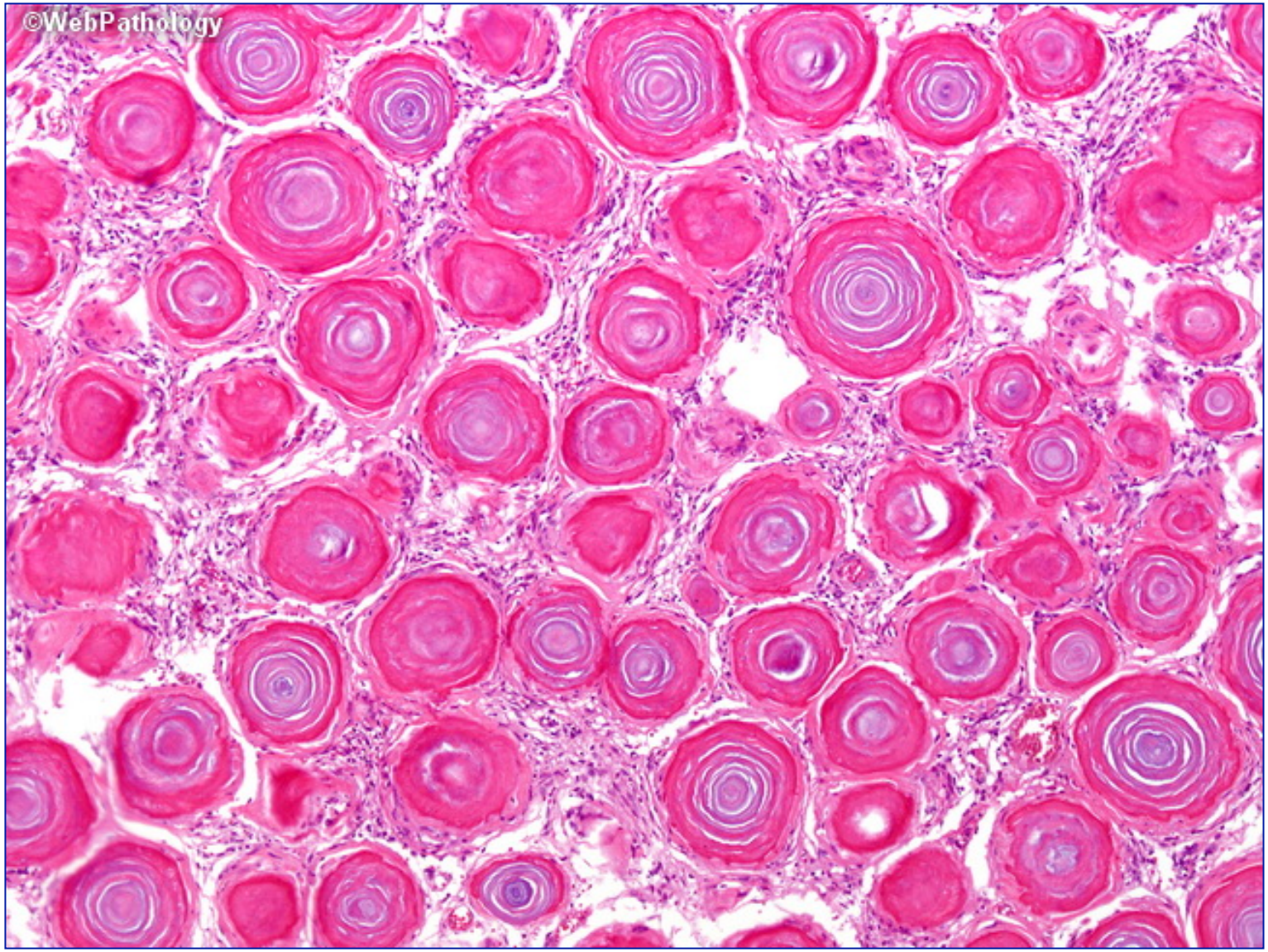
Fibrous



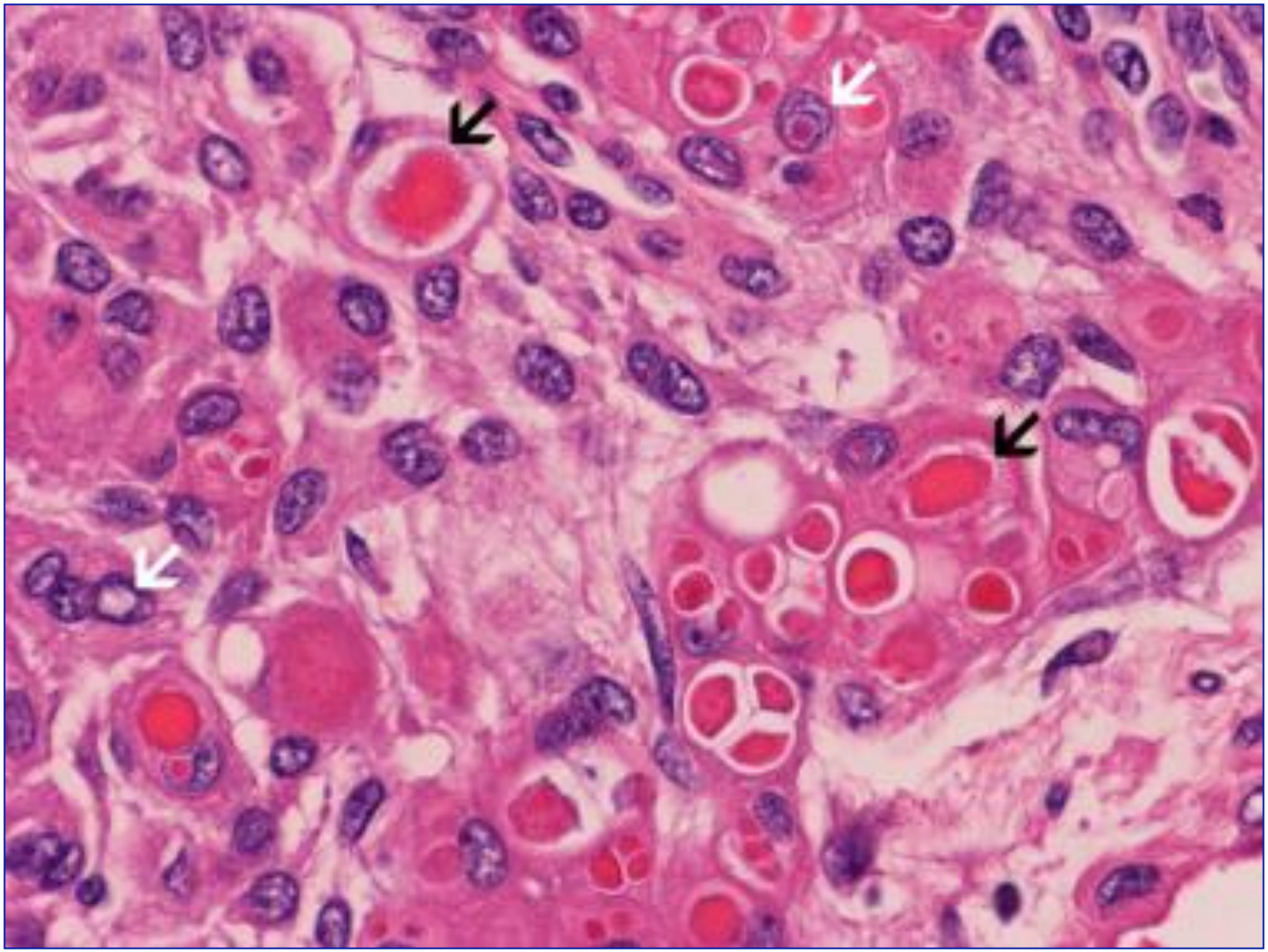
Transitional



Psammomatous



Secretory



Papillary: younger age at presentation (childhood)

aggressive course, recurrences, brain infiltration, metastases

prominent papillary growth, perivascular rosettes

Microcystic: associated with severe oedema

Clear cells: glycogen-rich (PAS*) (D.D: clear cell renal ca.)

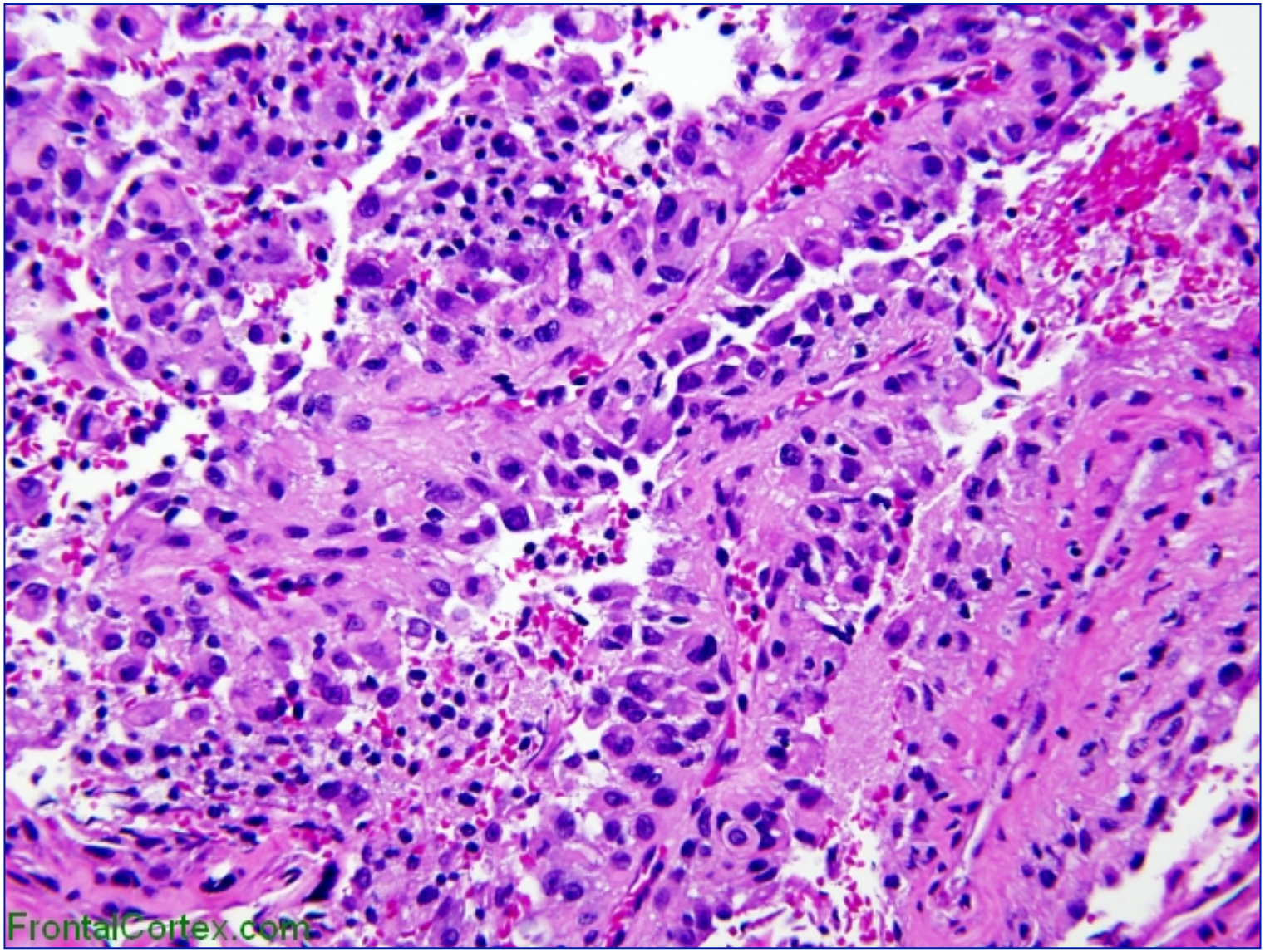
Chordoid: simulates chordoma

Metaplastic: bone, cartilage, myxoid tissue, xanthomatous cells

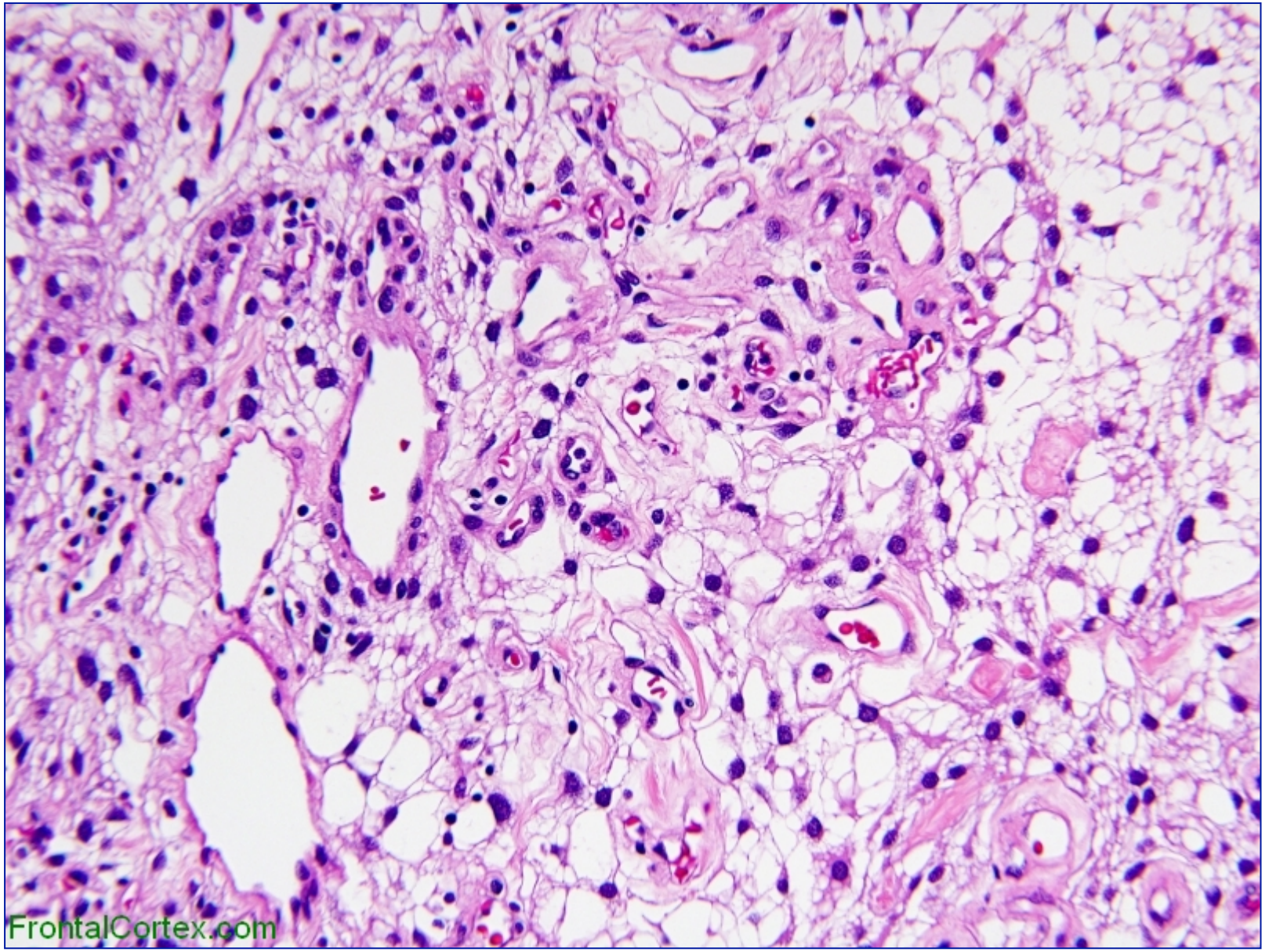
Limpho-plasmacytic: germinal centres, monoclonal gammapathy

Oncocytic

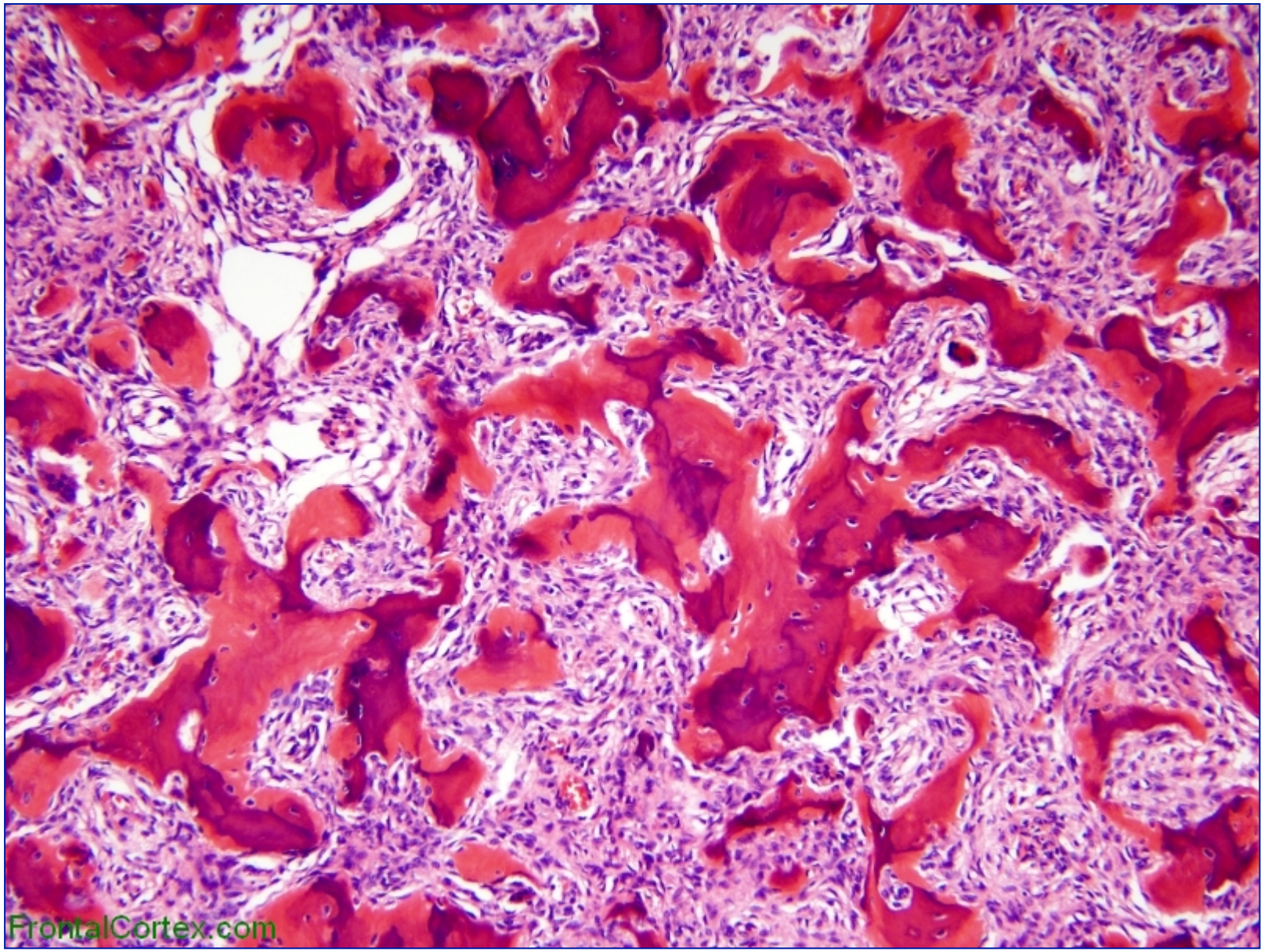
Papillary



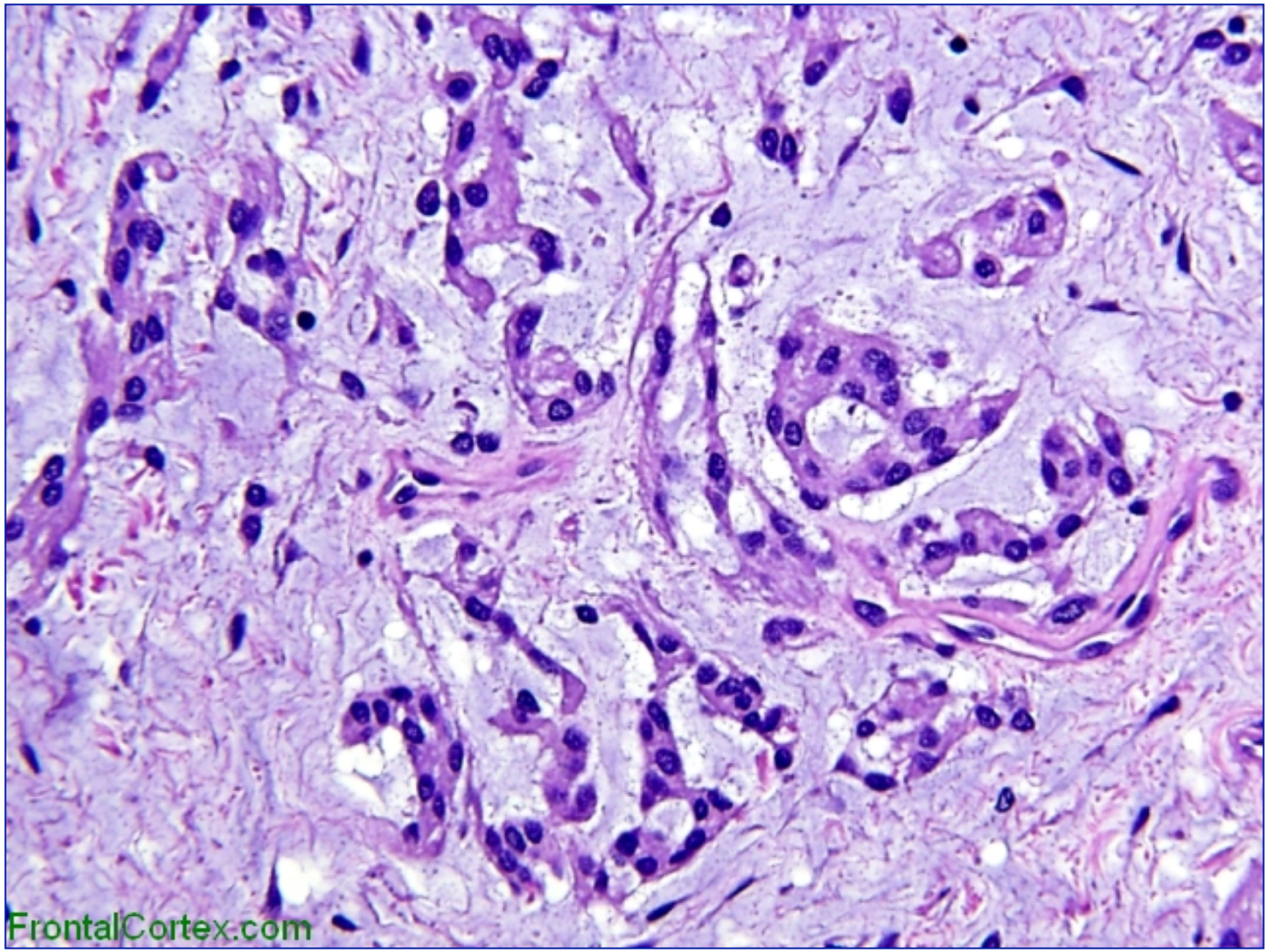
Microcystic



Metaplastic



Chordoid



Prognostic categories (WHO Grade):

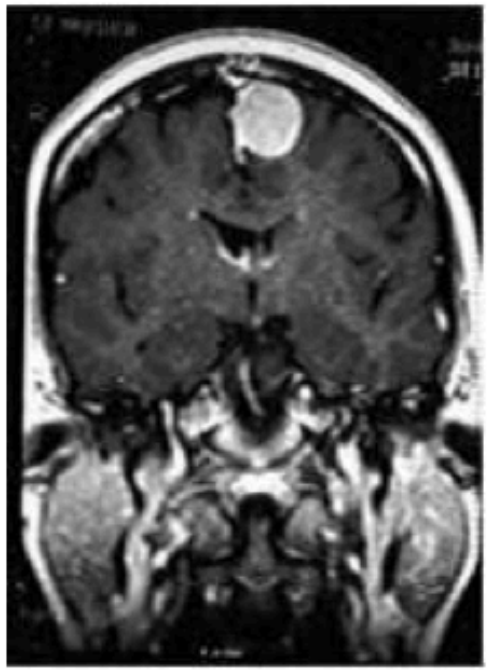
Classic (grade 1): may occasionally recur

Atypical (grade 2): Focally hypercellular

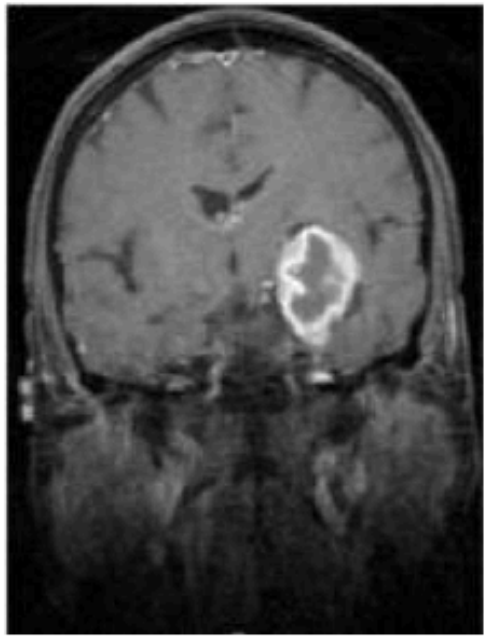
- Mitoses 5/10 HPF (40x)
- Mild nuclear atypia and nucleoli
- Small necrotic foci
- Brain infiltration
- May recur, metastasize and progress to anaplastic

How meningiomas are graded:

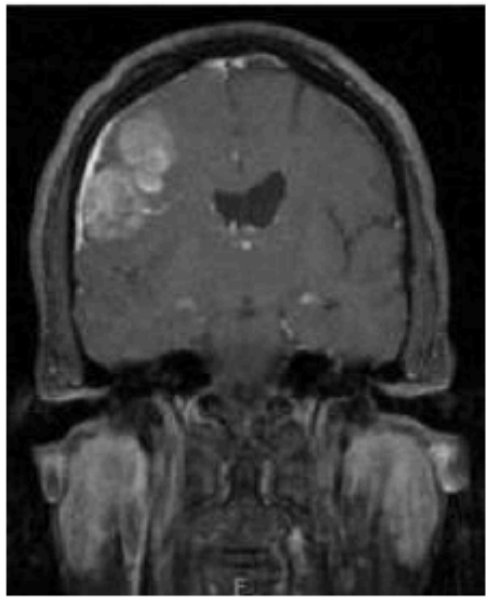
The grade (I to III) of a meningioma is based on the tumor cells' appearance under a microscope. Grade I is the most common and benign, and grade III is the most aggressive and is considered malignant.



example of a grade I meningioma



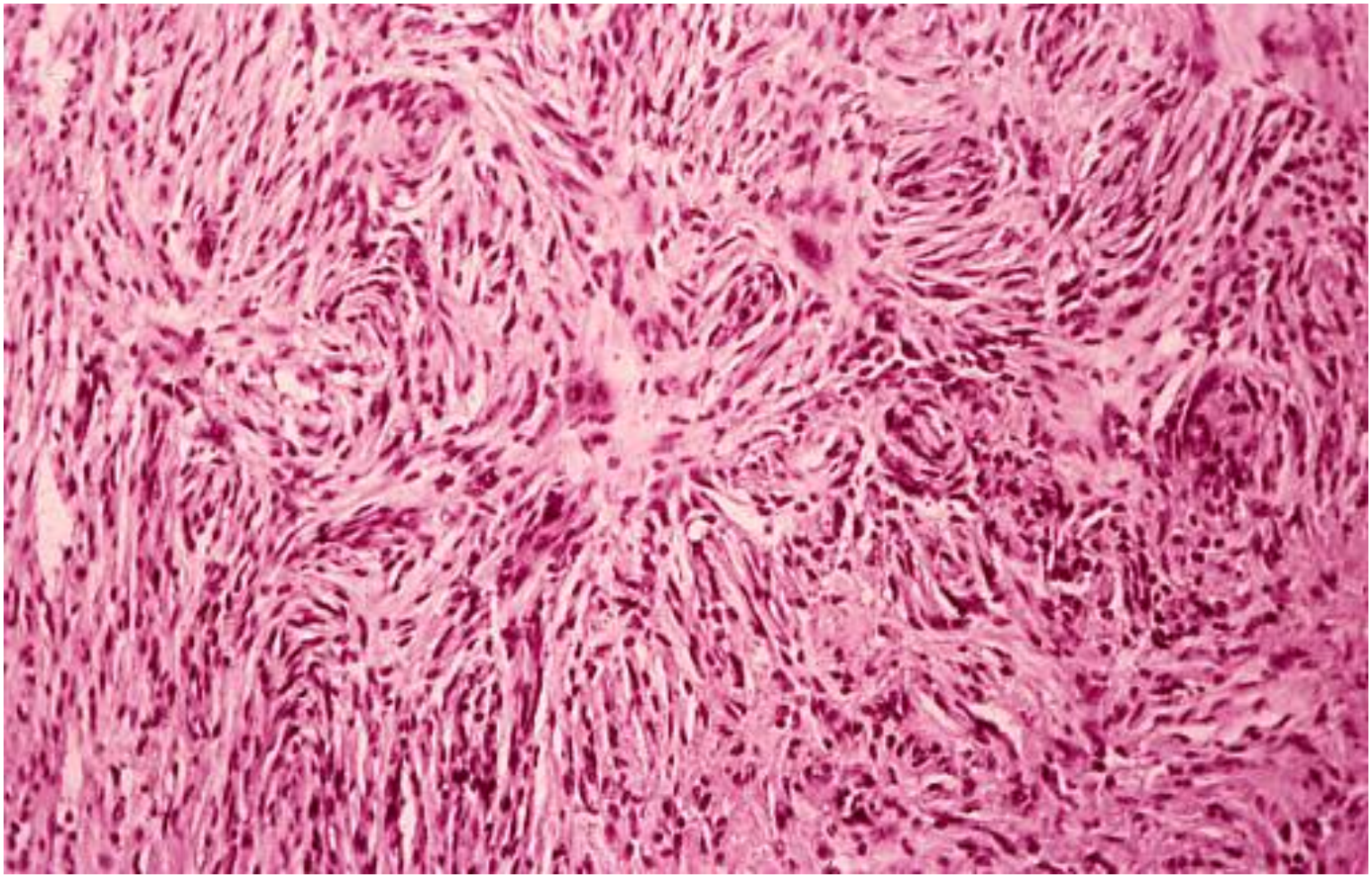
example of a grade II meningioma

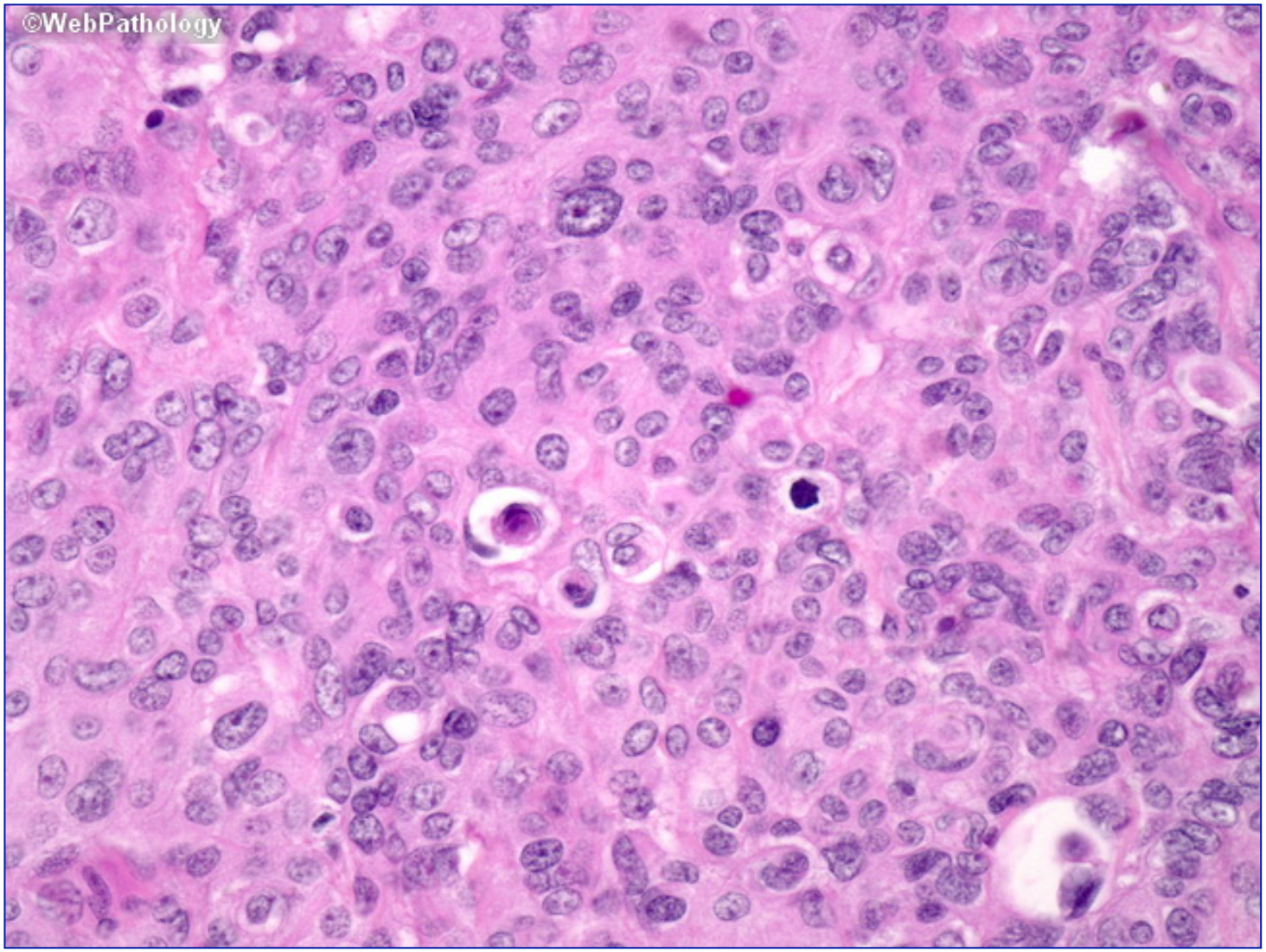


example of a grade III meningioma

There are three main grades (classifications) of meningiomas:

- **Grade I – Benign meningioma**: This non-cancerous type of brain tumor grows slowly and has distinct borders. Approximately 78-81% of meningiomas are benign (non-cancerous).
- **Grade II – Atypical meningioma**: Approximately 15-20% of meningiomas are atypical, meaning that the tumor cells do not appear typical or normal. Atypical meningiomas are neither malignant (cancerous) nor benign, but may become malignant. Grade II atypical meningiomas also tend to recur and grow faster.
- **Grade III – Malignant or anaplastic meningioma**: Malignant or anaplastic meningioma is an aggressive type of brain tumor that tends to invade the parts of the brain nearest to the tumor. Approximately 1-4% of meningiomas are grade III (cancerous).

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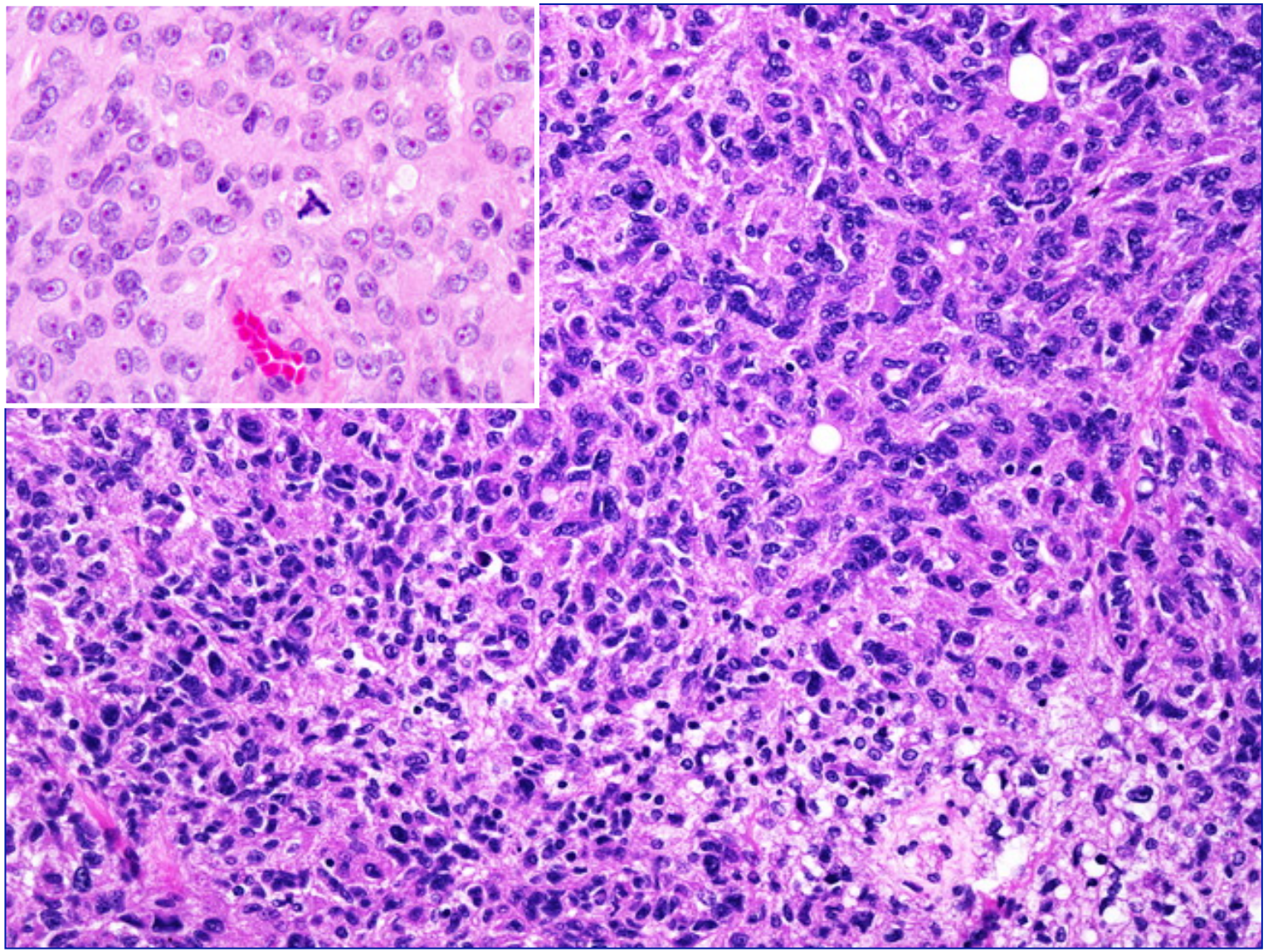
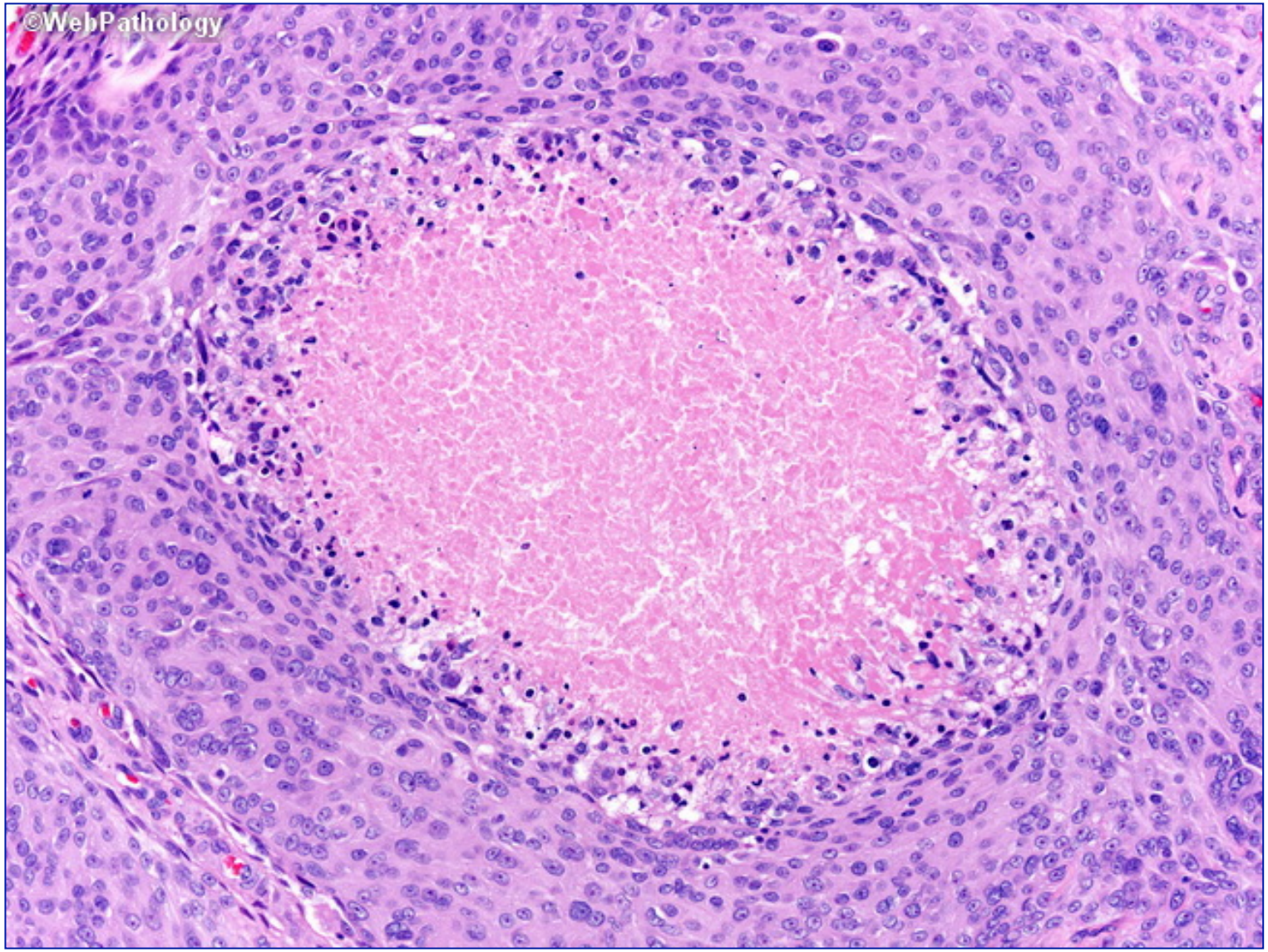
Prognostic categories:

Anaplastic (grade 3):Frankly hypercellular

- Mitoses ≥5/10 HPF (40x)
- Severe nuclear atypia and nucleoli
- Extensive necrosis with palisades
- Brain infiltration
- Aggressive course wiht frequent metastases (meningosarcoma)

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