Germinoma

- Central nervous system (CNS) germinomas have a propensity to hug the midline near the 3rd ventricle
- Suprasellar ~ 50-60%
- Pineal region ~ 30-40%
- Avid enhancement
- Often "speckled“

Clinical

- 90% of patients < 20 years old
- 20% multiple; most common = pineal with suprasellar
- Pineal region germinoma: M:F ~ 10:1
- Diagnostic Checklist
  - If young patient presents with diabetes insipidus, think germinoma or LCH.
- CSF dissemination and invasion of adjacent brain common

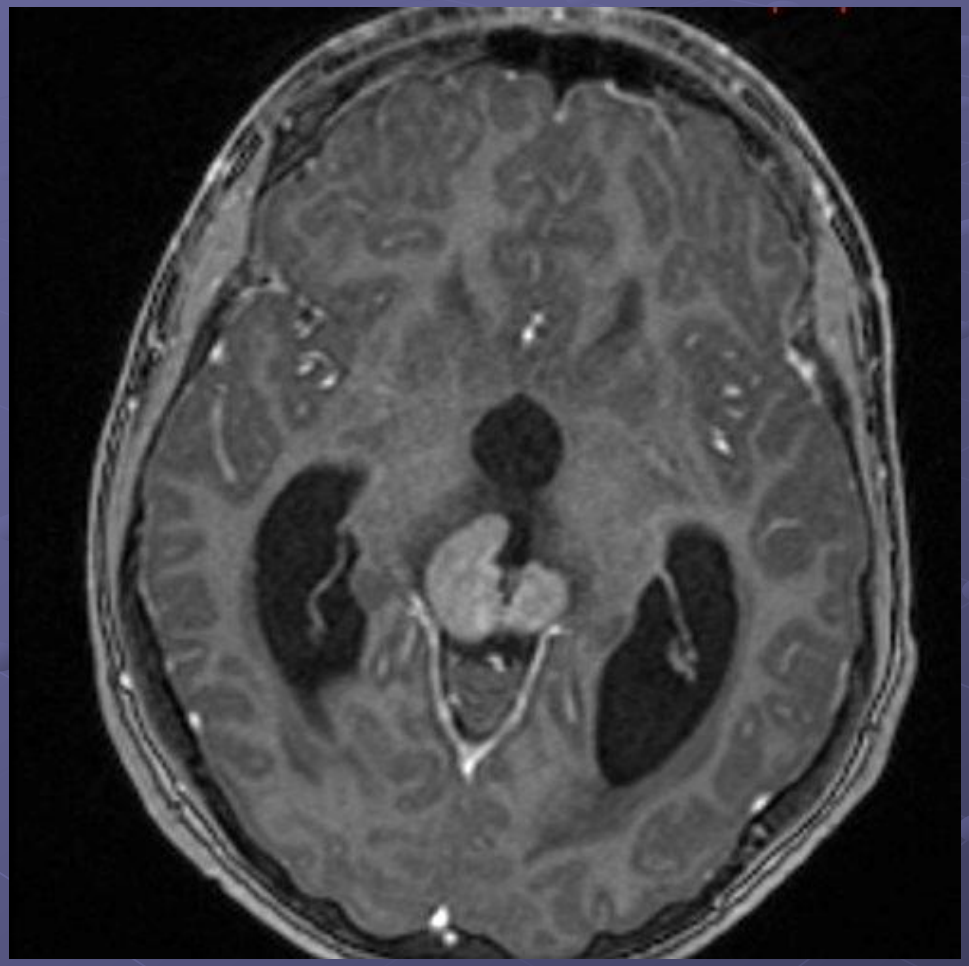
Location

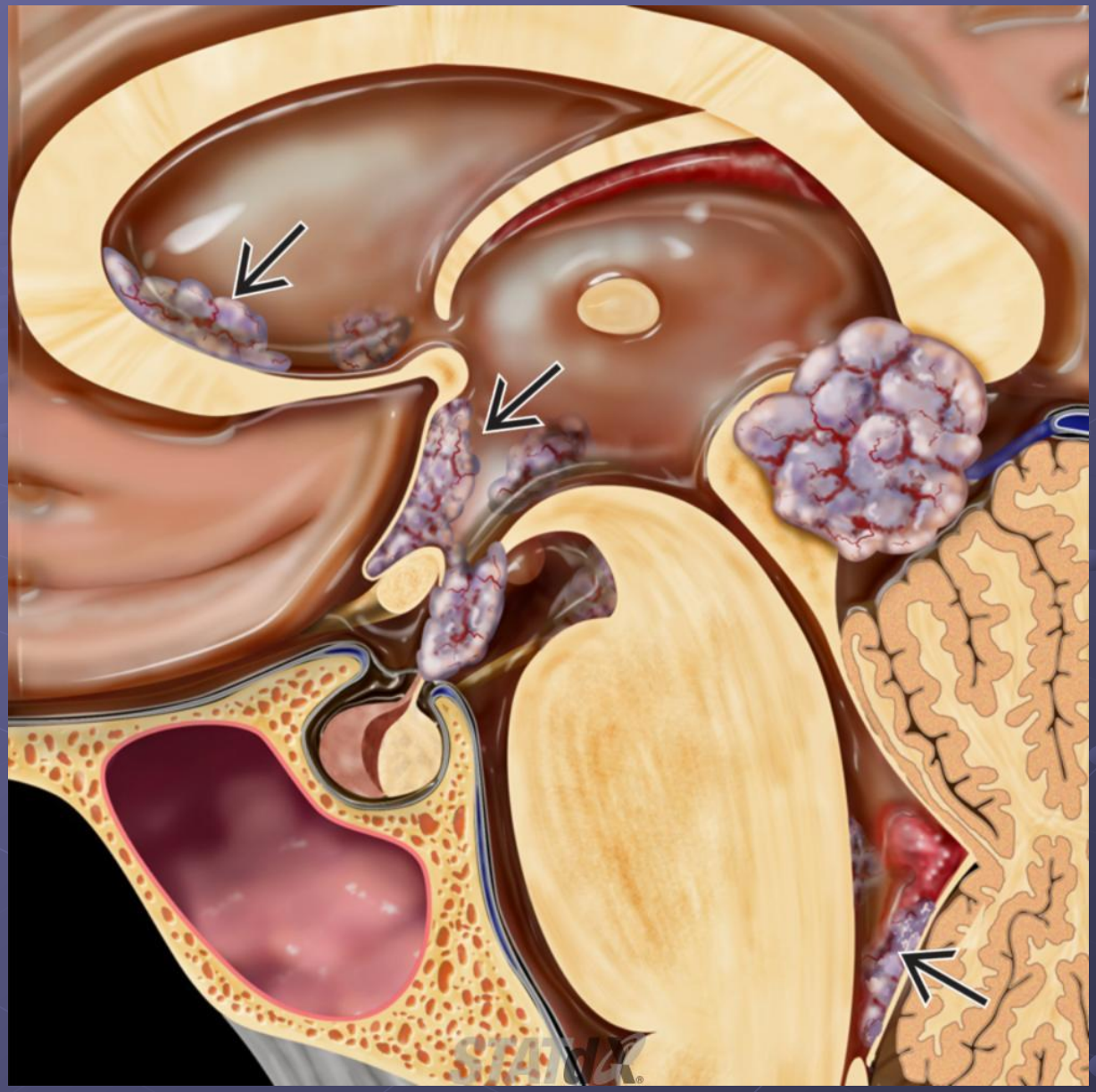
- Most common: In/near midline (80-90%)
  - Pineal region ~ 50-65%
  - Suprasellar ~ 25-35%
- Less common: Basal ganglia/thalami ~ 5-10%
- Other sites:
  - Intraventricular (3rd), intrasellar, bulbar, intramedullary, midbrain, hemispheric

DDX:

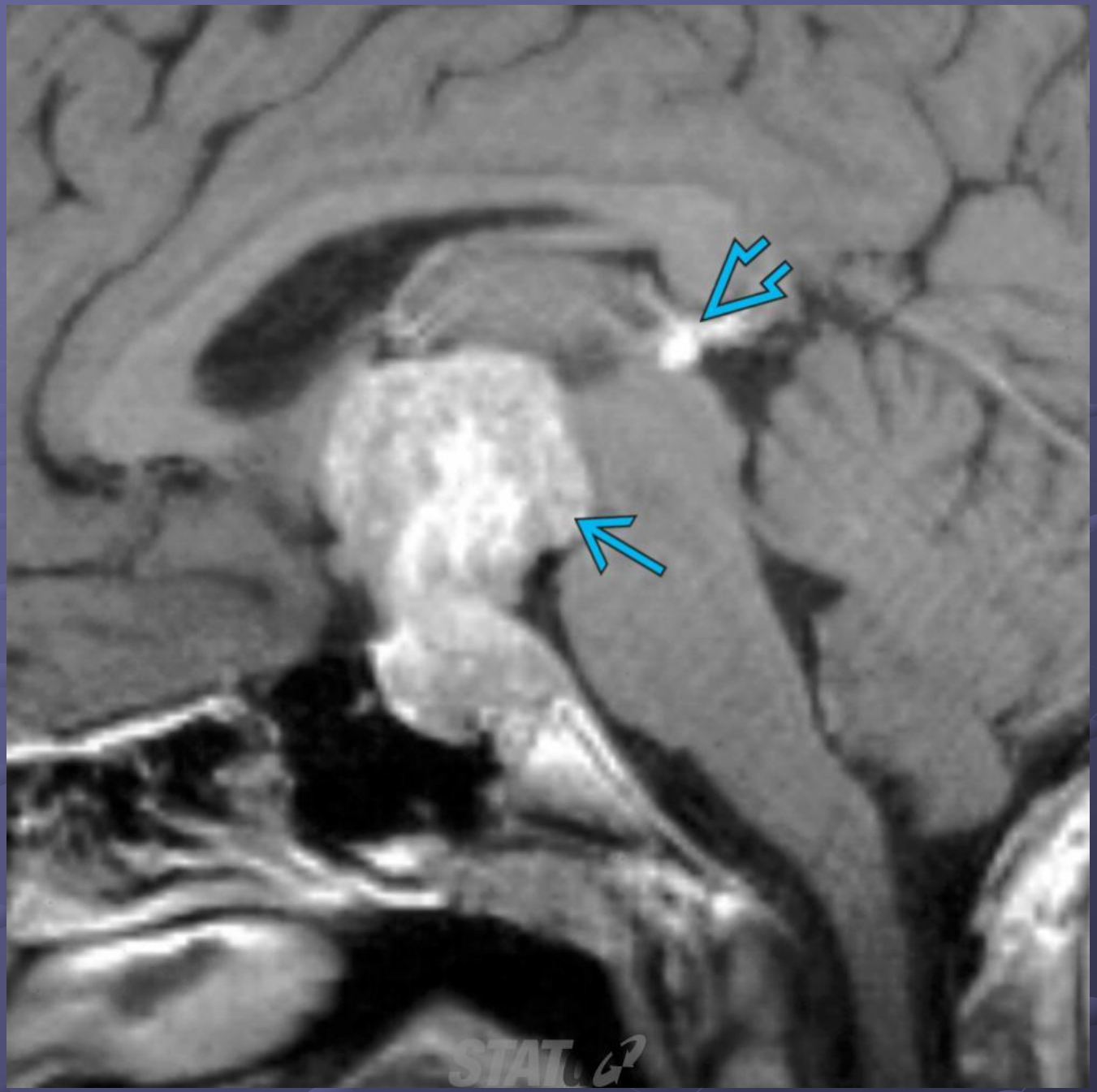
- **Other germ cell tumors (nongerminomatous germ cell tumors, NGGCTs)**
  - Malignant mixed germ cell, teratoma (mature, immature), yolk sac tumor, choriocarcinoma, embryonal carcinoma
    - Heterogeneous, Ca++, fat, hemorrhage
- **Pineoblastoma (pineal PNET)**
  - Mass "explodes" rather than "engulfs" pineal Ca++
    - Less helpful finding in pediatrics
    - Many children develop tumors well before developing physiologic pineal Ca++
- **Pineal cyst**
  - Atypical features (> 1 cm, heterogeneous enhancement, ± tectal compression)
  - Repeat imaging in 9-12 months to show stability if no other findings
- **Tectal astrocytoma**
  - Little or no enhancement
  - Blends into tectal plate

Mass engulfing pineal calcifications favors germinoma.
Imaging of the entire neuroaxis is required due to potential multifocality/spread. Highly radiosensitive lesion





Sagittal graphic shows synchronous germinomas in the suprasellar and pineal regions. Note the CSF spread of tumor in the lateral, 3rd, and 4th ventricles (black solid arrow).



Sagittal T1WI C+ MR shows a homogeneously enhancing sellar and suprasellar germinoma (cyan solid arrow). Note also the small synchronous lesion in the pineal location (cyan open arrow).