Teratoma

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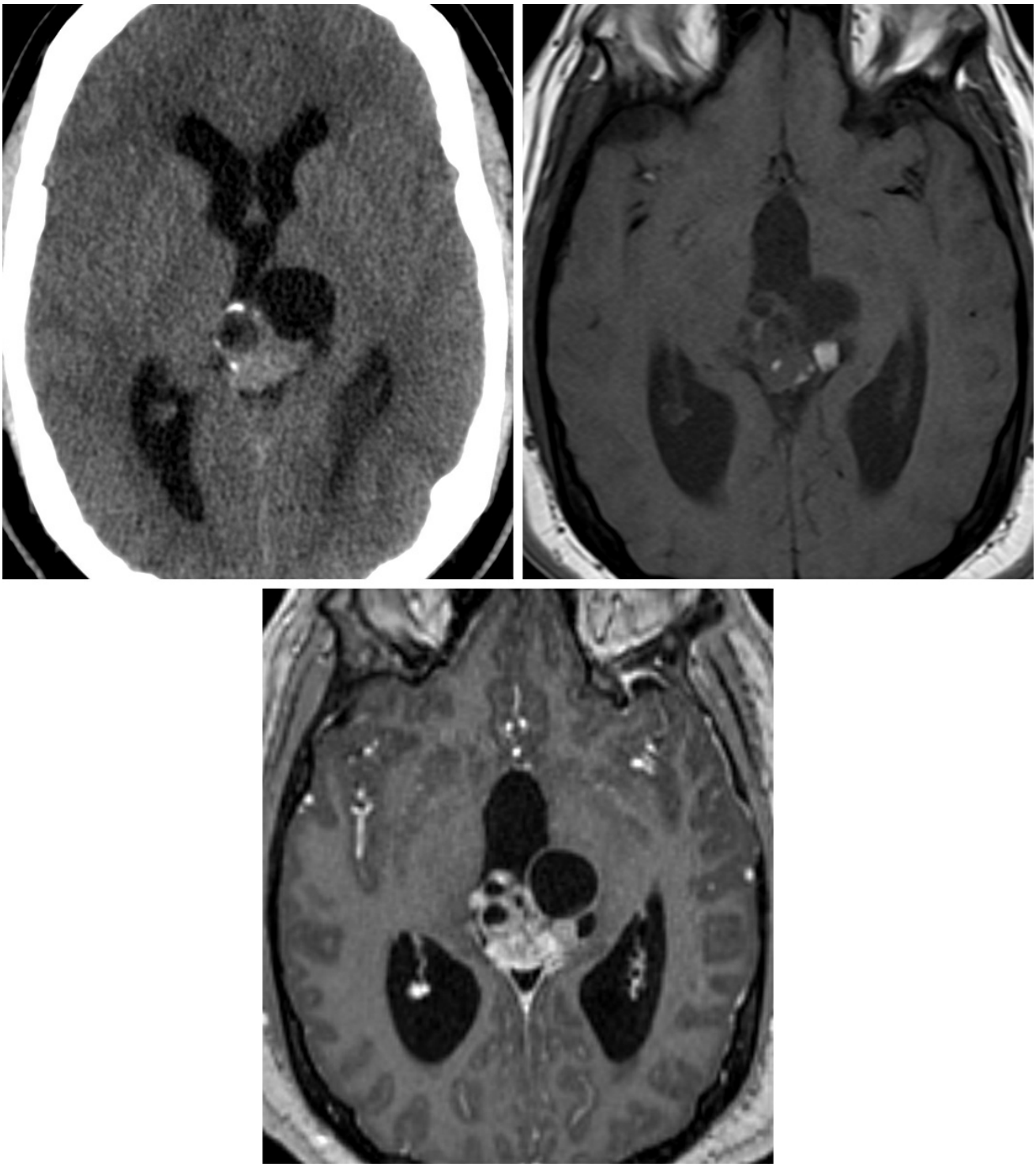

Figure 1: This complex pineal-region teratoma demonstrates areas of solid and cystic change and calcification on a CT image (top left) and areas of hyperintense fat signal intensity on a T1-weighted MR image

(top right). Heterogeneous enhancement is a hallmark finding that illustrates the complexity of teratomas on T1WI after contrast administration (bottom).

BASIC DESCRIPTION

- Midline intracranial tumor arising from multipotential germ cells

PATHOLOGY

- Contains tissue from all three germ cell types, ectoderm, endoderm, and mesoderm
  - Fat, calcification, teeth, soft tissue, sebaceum, and cysts
- Three types
  - Mature: well-differentiated, WHO grade 1, often with cystic tumor component
  - Immature: intermediate differentiation
  - Malignant: malignant degeneration of immature teratoma, may contain somatic tumors

CLINICAL FEATURES

- Arises during fetal development as a result of aberrant formation of the primitive streak
- Mean patient age at diagnosis: 15 years; may be detected on fetal ultrasound
- Male gender predilection (4:1)
- Laboratory findings: increased serum carcinoembryonic antigen (CEA) ± α-fetoprotein
- Common presenting signs/symptoms: macrocephaly/hydrocephalus, Parinaud syndrome
- Treatment: surgical resection
- Prognosis: majority are lethal in utero or during first week of life; patients with malignant teratomas have poor 5-year survival rate

(<20%)

IMAGING FEATURES

- General
  - Midline intracranial mass
    - Pineal region, sellar/suprasellar, basal ganglia, and spine
    - Mass effect on tectum, optic chiasm, and hypothalamus common
  - Contains calcifications, solid and fluid/cystic components, and fat
  - Size is variable, can be large in neonates (holocranial mass)
- CT
  - Heterogeneous and contain very low-density fat, hyperdense calcification (teeth), intermediate-density soft tissue, and low-density cysts
  - Soft tissue may enhance on contrast-enhanced CT imaging
- MRI
  - T1WI: heterogeneous hyperintensity due to fatty components and calcification
  - T2WI: isointense to hyperintense soft tissue, cysts/fluid; variable hyperintense peritumoral edema
  - T2*GRE: hypointense signal blooming in areas of calcification
  - DWI: diffusion restriction due to hypercellular solid components
  - T1WI+C: soft tissue components enhance, nonenhancing fatty or calcified portions

IMAGING RECOMMENDATIONS

- MRI without and with intravenous contrast including fat-suppressed sequences; CT imaging to detect calcification

For more information, please see the corresponding chapter in

Radiopaedia.

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