



Germinoma

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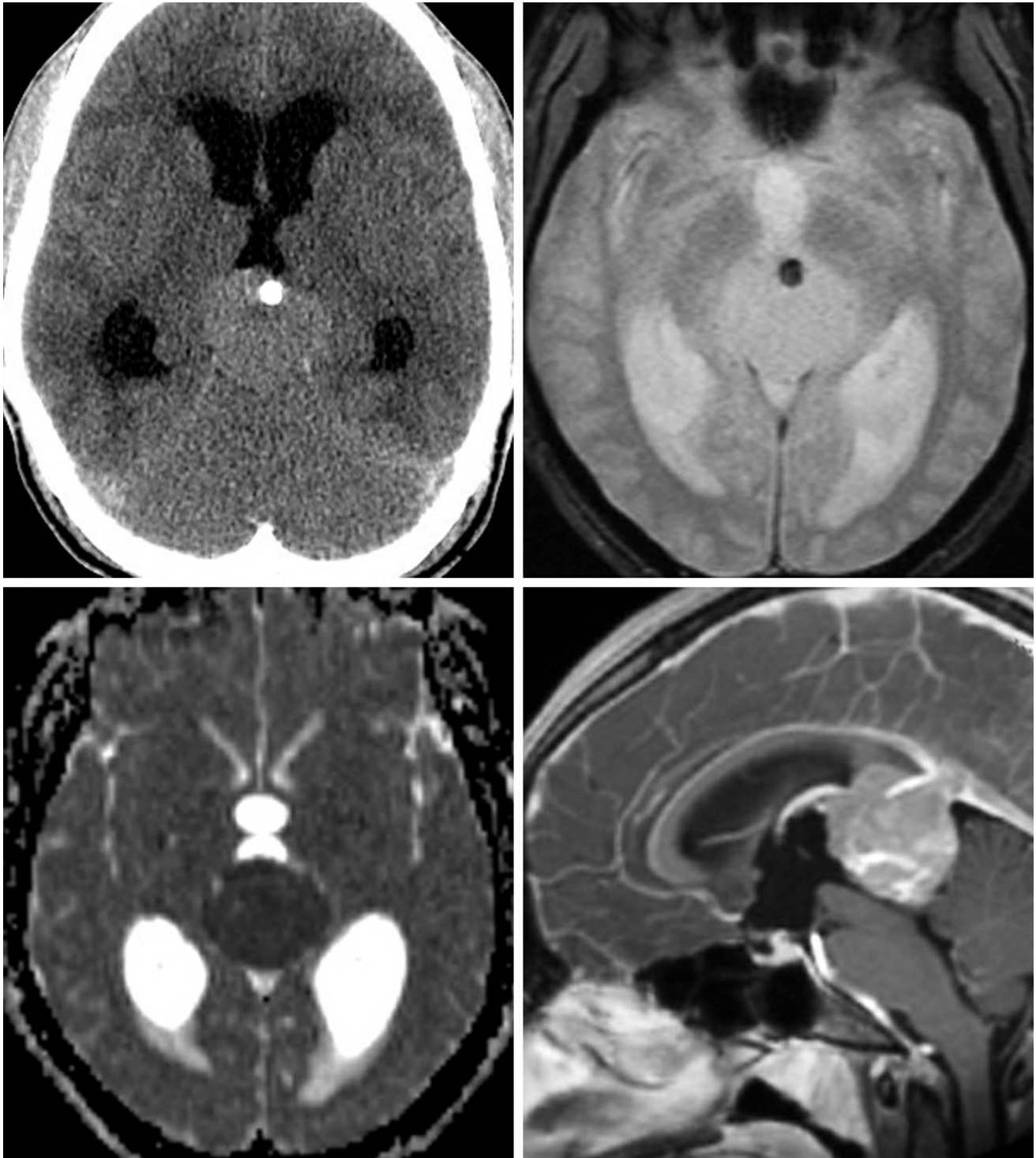


Figure 1: The CT image (top left) of this pineal-region germinoma demonstrates an "engulfed" appearance of the pineal calcification, also visible in the GRE image (top right). (Bottom Left) ADC imaging

demonstrates low signal diffusion restriction representing hypercellularity of this tumor. (Bottom Right) Avid enhancement in this T1WI postcontrast image is typical. This mass is causing obstructive hydrocephalus at the cerebral aqueduct.

BASIC DESCRIPTION

- Intracranial germ cell tumor, often occurring in the pineal region (extragonadal seminoma/dysgerminoma)

PATHOLOGY

- WHO grade II (pure germinoma) or grade III (syncytiotrophoblastic giant cells)
- Associated with Down and Klinefelter syndromes and neurofibromatosis type 1 (NF-1)
- Polygonal primitive germ cells and lymphocytic infiltrates are common microscopic features
- Single or multiple tumors can occur
 - Multiple tumors are considered [metastatic](#) rather than synchronous in the United States

CLINICAL FEATURES

- Children and young adults usually afflicted (90% are <20 years old)
- Marked male gender predilection (10–33:1) in pineal-region germinomas
- Females afflicted more commonly with suprasellar germinomas
- Common presenting signs/symptoms
 - Pineal region: headache due to mass effect on tectum and ventricular obstruction at the cerebral aqueduct, Parinaud syndrome (upgaze palsy)
 - Suprasellar: endocrine dysfunction (diabetes insipidus, precocious puberty), visual field defects
- Laboratory findings: increased serum/cerebrospinal fluid (CSF) beta-

human chorionic gonadotropin (β -hCG) level

- Treatment: biopsy, low-dose radiation \pm chemotherapy
- Positive prognosticators include mild elevation of β -hCG level and pure (WHO grade II) germinoma histology
- Invasion and CSF dissemination commonly occur

IMAGING FEATURES

- General
 - Mass within pineal or suprasellar region at or near midline
 - Engulfs pineal gland, can accelerate pineal calcification
 - Basal ganglia uncommonly involved
 - Single or multiple locations (metastatic)
 - Often infiltrates into ventricles, midbrain, thalamus; \pm CSF dissemination
- CT
 - Lobulated, hyperdense mass
 - \pm Cysts, hemorrhage
 - Avid, homogeneous enhancement on contrast-enhanced CT \pm CSF dissemination
- MRI
 - T1WI: isointense to hyperintense; normal posterior pituitary “bright spot” may be absent in suprasellar germinoma
 - T2WI: isointense to hyperintense; foci of hemorrhage appear hypointense; hyperintense areas of cysts or necrosis
 - FLAIR: mildly hyperintense
 - DWI: diffusion restriction due to hypercellularity
 - T1WI+C: avid, homogeneous enhancement including areas of CSF dissemination and parenchymal invasion
 - MRS: elevated Cho, decreased NAA

IMAGING RECOMMENDATIONS

- MRI without and with intravenous contrast including brain and spine to detect metastases

For more information, please see the corresponding chapter in [Radiopaedia](#).

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