Pineal Cystic Germinoma with Syncytiotrophoblastic Giant Cells Mimicking MR Imaging Findings of a Pineal Cyst

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Summary: We report a case of precocious puberty in a 4-year-old boy. Contrast-enhanced T1-weighted MR imaging suggested a pineal cyst with enhancement of the slightly thickened wall and focal wall irregularity. Three-dimensional constructive interference in a steady-state imaging revealed a focal lobulation and a nodule-like area in the lesion. The lesion mimicking a pineal cyst proved to be a germinoma with syncytiotrophoblastic giant cells, on the basis of biopsy and tumor marker results.

Primary pineal tumors are rare in all primary intracranial neoplasms, and most include germ cell tumors, pineal parenchymal tumors, and gliomas (1). Germ cell tumors are classified into six histologic types: germinoma, teratoma (mature and immature teratomas and teratoma with malignant transformation), embryonal carcinoma, choriocarcinoma, yolk sac tumor (endodermal sinus tumor), and mixed (2). They mainly affect children and adolescents. The germinoma may be divided into two categories: pure germinoma and germinoma with syncytiotrophoblastic giant cells (STGCs; 2, 3). Although clinical diagnostic criteria for germinoma with STGCs have not been firmly established, tumor markers are important for the diagnosis. When patients with germinomas show mild elevation of human chorionic gonadotropin (hCG) levels in serum or CSF, they are generally regarded as germinoma with STGCs (4, 5).

Pineal tumors have various neuroimaging findings by histologic heterogeneity in the pineal region (1, 6). Most pineal tumors grow as solid masses, and a cystic appearance is unusual (6–9). Although germinoma with cystic components has been reported (10–12), the cystic component is seldom confused with a pineal cyst. We herein report a case of a germinoma with STGC that was difficult to differentiate from a pineal cyst on the basis of routine MR imaging findings.

Accepted October 24, 2003; accepted after revision January 21, 2004.

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components were found in 17 of 27 patients with germ cell tumors. The incidence of having cystic components was 44% in germinomas and 100% in non-germinomatous germ cell tumors. The size and number of the cysts were variable. Liang et al concluded that the high incidence is probably due to the improved spatial resolution of MR imaging; however, a germinoma mimicking a pineal cyst has not been described in their studies.

Unlike pineal tumors, pineal cysts are benign, usually asymptomatic, and found incidentally at MR imaging. The prevalence found by using MR imaging in healthy subjects is 1.4–4.3% (13). The pineal cysts are lined by collagenous fibers, glial cells, and normal pineal parenchymal cells (13). Although the size of the cyst may change at follow-up, they are not associated with specific clinical findings (14). The pineal cysts are round and smoothly marginated at MR imaging and have thin smooth walls no more than 2 mm thick (15, 16). The contents of the pineal cyst are usually homogenous and are either isointense relative to CSF or diffusely hyperintense (1, 14). Nodular, rim, or irregular enhancement of the cyst wall may be seen (16, 17). The enhancement pattern may be due to fragmentation of the pineal parenchyma as the cyst enlarges (16). The variable MR imaging appearance of benign pineal cysts may make them indistinguishable from other pineal-region tumors (16). Although it has been recommended that particularly large pineal cysts (>1.4 cm) undergo follow-up imaging (18), no evidence has been presented to suggest that large cysts are more likely to grow or become symptomatic.

In our case, two things were unusual as a pineal cyst. The first was that the patient had specific symptoms that could be referred to a suprasellar or pineal tumor. Second, MR imaging findings were not typical, but were rather atypical, for a pineal cyst. The overall size of the cyst was also atypical for a pineal cyst. On the basis of these unusual conditions for a pineal cyst, surgical biopsy was performed.

CISS images provided additional anatomic details of the cystic lesion compared with conventional MR images in this case. CISS images have been applied for the assessment of small structures adjacent to or in the CSF (19). Because the pineal gland is a small structure and surrounded by the CSF, high-spatial-resolution images like those of CISS might be more useful for identifying internal structures of the pineal lesions. Although CISS usually shows the pineal cyst as smooth and thin with a hypointense wall containing homogeneous hyperintense components similar to those of CSF, further studies regarding the CISS appearance of benign pineal cysts are needed.

Conclusion

We reported a germinoma with STGC that was not completely distinguishable from a pineal cyst on the basis of routine MR imaging findings. CISS imaging was useful for identifying detailed internal structures of the lesion. Tumor markers and biopsy were essential for accurate diagnosis.

References


