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MR of Benign Pineal Cyst

Pineal glands with high signal intensity frequently are seen on T2-weighted MR images of the brain. Recently, Mamourian and Towfighi [1] reported this observation in 4.3% of MR brain scans performed in patients who had no associated neurologic findings and suggested that the high signal in pineal glands is due to pineal cysts. However, in none of their 29 observed cases was pathologic proof provided, nor did any of the cysts they observed result in neurologic symptoms. We herein report a case of a round, enlarged pineal gland with homogeneous high signal on T2-weighted MR images that was resected and histologically confirmed to be a pineal cyst. This case is also extremely unusual because the cyst resulted in neurologic symptoms, causing paralysis of upward gaze.

Case Report

A 49-year-old woman had a new onset of limitation of upward gaze. Axial CT scans with and without IV contrast material showed apparent enlargement of the quadrigeminal cistern (Fig. 1A) without a specific mass. MR imaging on a 0.6-T Technicare system showed an enlarged, round pineal gland that indented the quadrigeminal plate, particularly the superior colliculus (Figs. 1B and 1C). The pineal yielded moderately low signal on T1-weighted spin-echo images 500/30 (TR/TE) and homogeneously high signal on T2-weighted images 3000/80. No surrounding edema was present.

The pineal mass was excised completely via a right occipital craniotomy. The mass was cystic and was opened in the operating room, yielding xanthochromic fluid. Permanent histologic sections (Fig. 1D) of the cyst wall showed normal pineal tissue and gliotic brain parenchyma without evidence of tumor, confirming the diagnosis of a simple benign pineal cyst. Postoperatively, the patient's limitation of upward gaze resolved.

Discussion

This case provides histologic proof of a benign pineal cyst that was seen as a homogeneous, round lesion with low signal on T1-weighted images and high signal on T2-weighted images. Benign pineal cysts are more conspicuous on MR images than on CT scans. On CT, cysts may be indistinguishable from the quadrigeminal plate cistern. Although pineal glands with high signal intensity have been

reported in 4.3% of MR brain scans [1], pineal cysts can be found at autopsy in up to 20–40% of asymptomatic patients [2].

In most cases, pineal cysts are asymptomatic and do not require treatment. Surgical resection in this case was mandated by the patient's symptoms. This patient had only one of several known signs and symptoms of pineal enlargement: a deficit in upward gaze caused by compression of the superior colliculus. Other signs and symptoms that may be associated with pineal enlargement include headache, nausea and vomiting, diplopia, visual field defects, diabetes insipidus, and hypopituitarism [3].

The advantage of MR in evaluating pineal tumors includes multiplanar imaging capability, sensitivity in detecting pathologic tissue, and the ability to differentiate cystic fluid from CSF. However, MR may fail to distinguish malignant pineal tumors because of a lack of signal from calcium [4], especially in children, in whom the presence of calcium provides an important clue to malignancy [5]. Although further studies are certainly necessary, this case supports the contention that when a round, enlarged pineal has a homogeneously high signal intensity on T2-weighted images and moderately low signal on T1-weighted images, the diagnosis of pineal cyst can be made.

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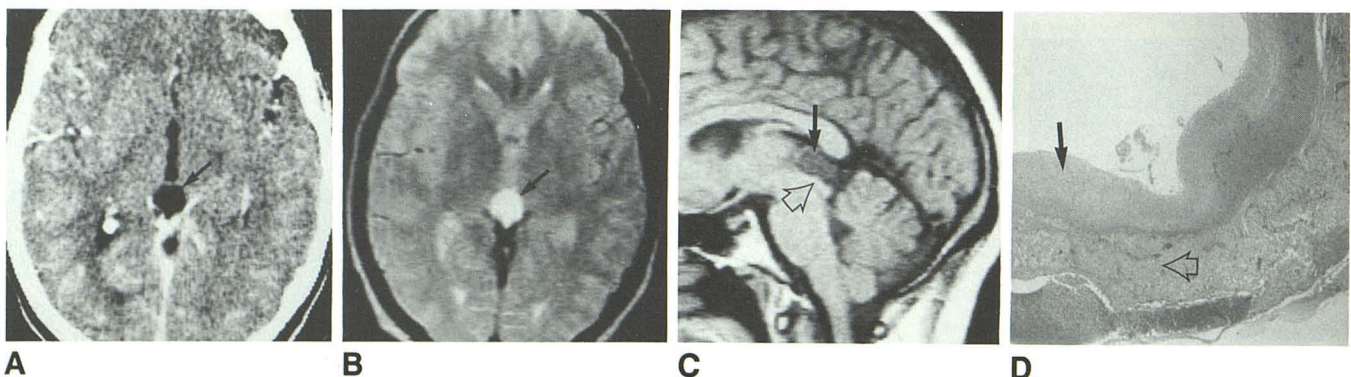


Fig. 1.—Benign pineal cyst in a 49-year-old woman.
A, On axial CT with IV contrast material, cyst (arrow) has same density as third ventricle and can easily be overlooked.
B, Axial T2-weighted MR image 3000/80 shows homogeneous high-signal cyst (arrow) with no surrounding edema.
C, Sagittal T1-weighted MR image 500/30 shows moderately low-intensity cyst (arrow) compressing superior colliculus (open arrow).
D, Stained histologic section of cyst wall shows fibrovascular inner lining (solid arrow) surrounded by gliotic brain parenchyma (open arrow). There is no evidence of malignancy. (H and E)