

## Pineal cyst coexisting with AVM: A case report

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(Received February 7, revised March 14, 1991)

**Summary** Pineal cyst has been reported to be present in about 25-40% of autopsy cases, but few cases have been revealed radiologically and confirmed histopathologically. We experienced a very rare case of pineal cyst which coexisted with arterio-venous malformation in the right occipital lobe. On MRI, the pineal cyst showed hypointensity on T<sub>1</sub>-weighted image, hyperintensity on T<sub>2</sub>-weighted image, and no mass effect. Although the coexistence of pineal cyst and AVM may be merely coincidental, some congenital factors should be considered.

*Key Words:* Pineal Cyst, AVM, MRI

### Introduction

Pineal cyst has been reported to be present in about 25-40%<sup>(1,2)</sup> of autopsy cases, but few cases have been discovered radiologically and confirmed histopathologically. Moreover, it is very rare for pineal cyst to coexist with arterio-venous malformation (AVM). The present paper reports a case of pineal cyst coexisting with AVM in the right occipital lobe.

### Case Report

The patient was a 40-year-old man, who had suffered from a cold sensation over the left half of the body including the face for 15 years, since an episode of subarachnoid hemorrhage, although the exact cause was unknown. In 1987 he consulted a local doctor and abnormal intracranial lesions were revealed by computed tomography (CT) and magnetic resonance images (MRI). On admission to our hospital, there were no other neurological findings.

Examination: Neurological examination revealed the patient to be alert and fully oriented.

Visual activity, extraocular movements, and optic discs were normal. He had no apparent motor weakness and his tendon reflexes were normal. The results of sensory examinations were also normal. A CT scan revealed a low-density mass, which had slightly higher density than that of cerebrospinal fluid (CSF), in the pineal region. A vague low-density area with contrast enhancement was visible in the right occipital lobe (Fig. 1). MRI revealed a cystic lesion in the pineal region that showed homogeneous hypointensity on T<sub>1</sub>-weighted images and hyperintensity on T<sub>2</sub>-weighted images. In the right occipital lobe, a flow-void mass suggesting AVM was seen (Fig. 2). MRI gave good three-dimensional images, allowing clearer recognition of the relationship between the mass and the surrounding structures, such as the great vein of Galen, the quadrigeminal plate and aqueduct. No mass effect was seen in case of pineal cyst. A regular cyst wall was shown on the axial T<sub>1</sub> weighted images after intravenous injection of Gd-DTPA (Fig. 3).

Cerebral angiography demonstrated AVM in the right occipital lobe supplied primarily via posterior temporal and parieto-occipital arteries, and drained through the sagittal sinus via the

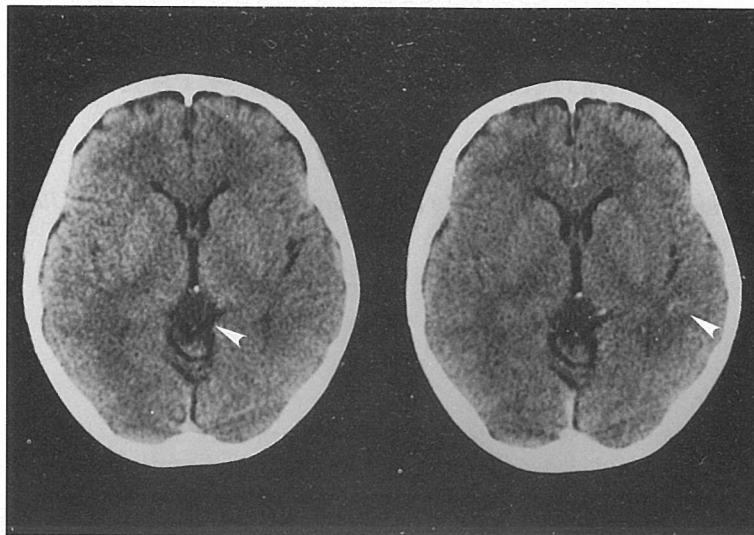


Fig. 1 left : Computed tomography (CT) scan showing a low density mass in the pineal region, which density is slightly higher than that of CSF (arrow head).  
 right : Contrast-enhanced CT scan revealed a slightly enhanced vague region in the right temporo-occipital region (arrow head).

superficial veins (Fig. 4).

Operation: After the AVM had been totally removed, the infratentorial supracerebellar approach was performed for enucleation of the pineal cyst. Upon punctures of the thin cyst membrane, watery clear cyst fluid was expelled. At the third ventricle side, parenchymal portion was located and removed for histopathological examination.

Pathological Examination: The capsule consisted of collagenous tissue and possibly glial cells. The parenchymal tissue consisted of normal pinealocytes and interstitial connective tissue. These findings were typical of pineal cyst.

## Discussion

Megyeri and Tapp reported that Pineal cysts were relatively common findings at autopsy, with an incidence ranging from 25 to 40%<sup>(1,2)</sup>. This figure, of course, included microcysts. As to the detection rate of pineal cyst using MRI, Mamourian<sup>(3)</sup> reported it to be 4.3%, whereas Donald<sup>(4)</sup> stated it was 1.5%. In a review of 950 MR examinations, we identified 4 cases of pineal cyst with an occurrence rate of 0.4%. The present

case was a very rare in which pineal cyst coexisted with AVM in the right occipital lobe. No report has been found about the coexistence of a pineal cyst and intracranial AVM. Although the coexistence of these diseases may be merely coincidental, some congenital factors should be considered. Differential diagnosis of cystic lesions in the pineal region should include arachnoid cyst, dermoid, epidermoid and pineal tumor. Mamourian<sup>(3)</sup> and Donald<sup>(4)</sup> reported that pineal cyst showed hypointensity on T<sub>1</sub>-weighted MR images, and hyperintensity on T<sub>2</sub>-weighted images. Our present case had the same characteristics on MRI. Bent<sup>(5)</sup> reported that arachnoid cyst showed hypointensity on T<sub>1</sub>-weighted MR images and hypointensity or isointensity on T<sub>2</sub>-weighted images. Roger<sup>(6)</sup> experienced a case of dermoid in the pineal region and reported that it showed hyperintensity on both T<sub>1</sub>- and T<sub>2</sub>-weighted images. As to germinoma, which is the most common tumor in the pineal region, Kilgore<sup>(7)</sup> reported that it showed isointensity on both T<sub>1</sub>- and T<sub>2</sub>-weighted images and that almost all cases were associated with a mass effect. This is an

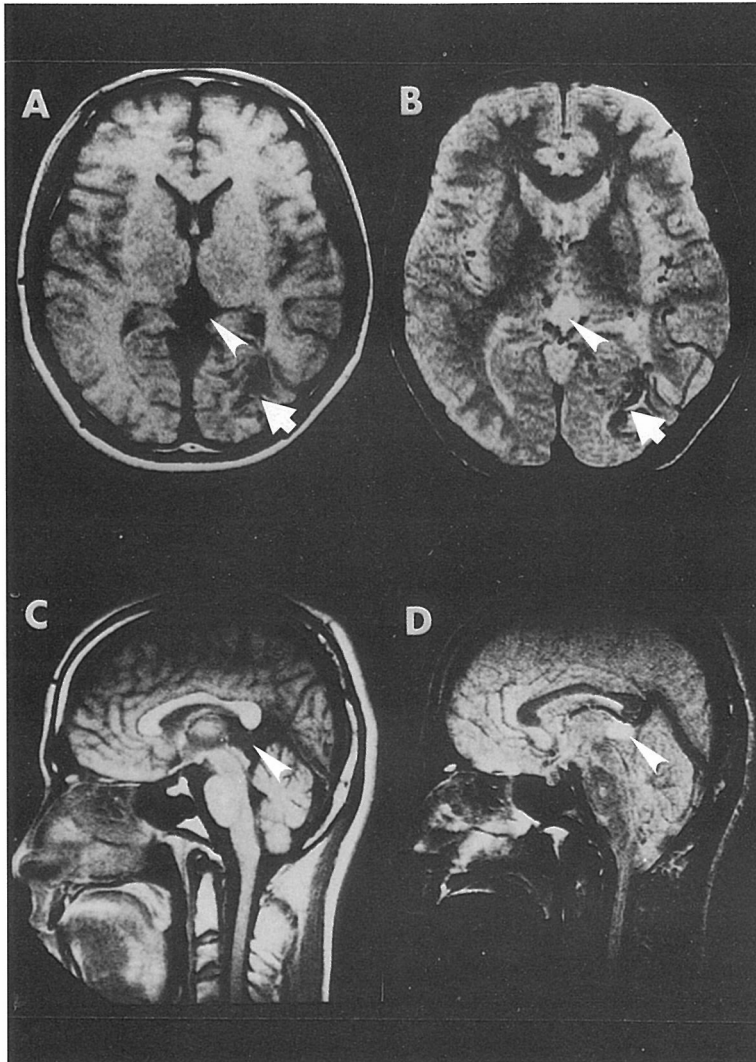


Fig. 2 left :  $T_1$ -weighted Magnetic Resonance (MR) images revealed hypointensity mass in the pineal region (arrow head) and irregular shaped hypointensity mass suggesting AVM in the right occipital lobe (arrow).

right :  $T_2$ -weighted MR images demonstrated hyperintensity mass in the pineal region (arrow head) and hypointensity mass consisting of some linear flow-void suggesting AVM was observed (arrow).

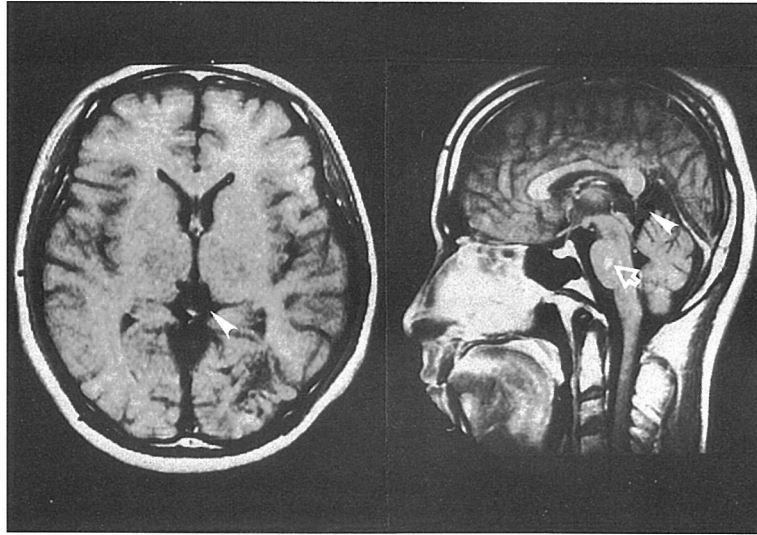


Fig. 3 T<sub>1</sub>-weighted MR images after injection of Gd-DTPA revealed vague enhanced cyst wall (arrow head).  
\*Hyperintensity mass in the mid-pons (arrow) is artifact.

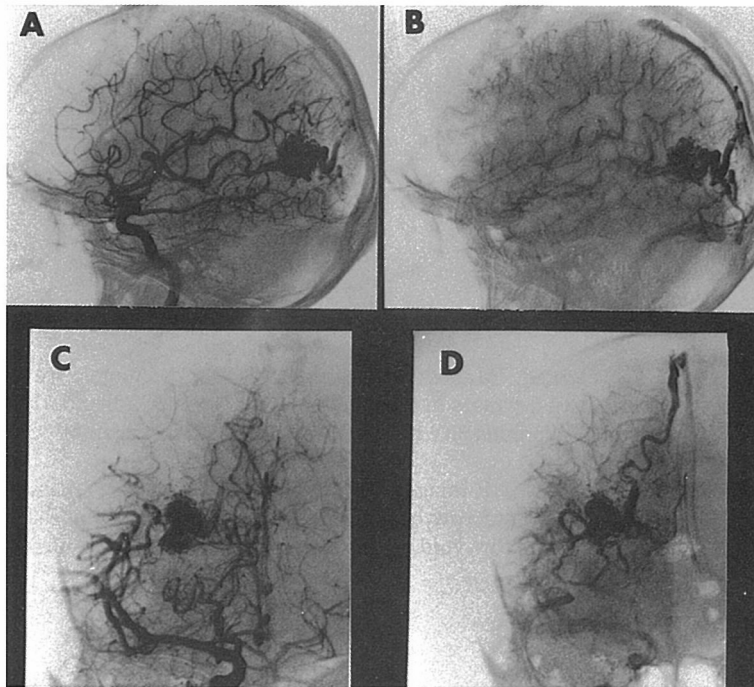


Fig. 4 Right internal carotid angiogram showing AVM in the right occipital lobe, supplied primarily via the posterior temporal and parieto-occipital arteries and drained through superior sagittal sinus via the superficial veins.

important point to consider for differential diagnosis of pineal tumor from other pineal cystic lesions. The indications for surgery in case of pineal cyst are controversial. Although we chose a surgical approach for determination on the histopathological diagnosis, we now conclude that, if MRI and CT scan strongly suggest pineal cyst without neurological deficits, then follow-up MRI is recommendable.

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