



What is Your Radiologic Diagnosis?

Radyolojik Tanınız Nedir?

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A 10-year-old male patient with no known disease presented to an external center with complaints of sudden onset of loss of consciousness and collapse one day earlier. Despite having no history of trauma, cranial computed tomography (CT) scan revealed a 7 cm cystic lesion in the left temporoparietal region of his brain, upon which he was subsequently referred to our center for further evaluation. The patient was residing in a rural area and had contact with dogs; his vital signs, neurological, and systemic examinations were all within the normal range. Complete blood count, biochemical tests and acute phase reactants were within normal limits. *Echinococcus* indirect hemagglutination test was negative. The patient's family underwent screening for hydatid cysts, and no other cases of hydatid disease were identified. No cystic lesion was found on posteroanterior chest radiography and abdominal ultrasonography. Preoperative brain magnetic resonance imaging (MRI) revealed a cystic lesion located intraparenchymally in the left temporoparietal area, measuring approximately 7 x 7 cm, with regular contours and appearing markedly hyperintense on T2-weighted sequences. There was no vasogenic edema around the lesion. It was compressing the surrounding tissues (Figure 1). Contrast-enhanced imaging showed thin, smooth-surfaced enhancement of the cyst wall. No solid component was observed (Figure 2).

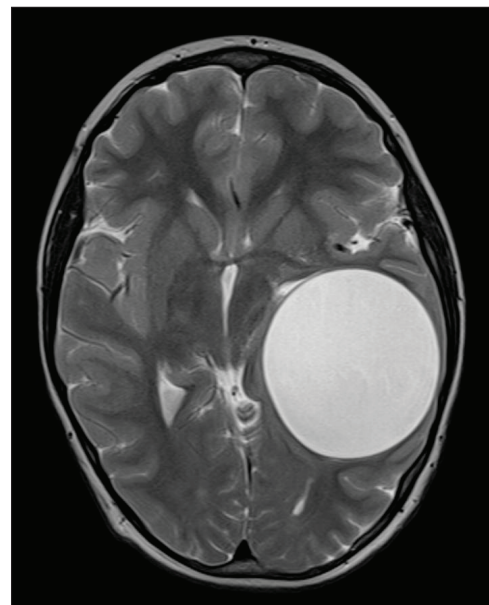


Figure 1. Cystic mass in the left temporoparietal area with smooth contour and marked hyperintense on T2A sequences.

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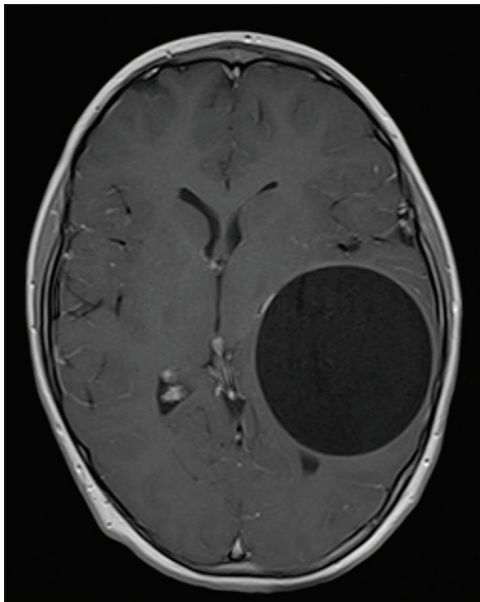


Figure 2. Fine and uniform contrast enhancement in the cyst wall on contrast-enhanced T1A.

What is your diagnosis according to the patient's history and imaging findings?

DIAGNOSIS: Hydatid cyst

Discussion

The absence of edema around the lesion and the thin, smooth enhancement of its wall on the patient's brain MRI suggested hydatid cyst. The patient underwent surgical excision of the cyst by a neurosurgeon. Intraoperative findings were consistent with hydatid cyst. Furthermore, pathological examination of the cyst fluid confirmed the diagnosis of hydatid cyst disease. The patient received oral albendazole (15 mg/kg/day, in two divided doses) for three months. The patient showed no neurological deficits after treatment and continued to be followed up in the pediatric clinic for infectious diseases. *Echinococcus* indirect hemagglutination test was repeated during follow-up and yielded negative results.

Hydatid cyst is a zoonotic parasitic disease often caused by *Echinococcus granulosus* and *Echinococcus multilocularis* (1). Humans are incidental hosts, and they play no role in the transmission cycle. They are infected through the consumption of contaminated food. The causative agent penetrates the gastrointestinal mucosa and then spreads throughout the body via the hematogenous route (2). While it most commonly affects the liver and lungs, it can rarely involve other organs such as the brain, heart, bone, and kidneys. Cerebral involvement accounts for 1-2% of the cases and is most frequently seen in adolescents and children (3,4).

Primary cerebral hydatid cysts are typically solitary (5,6). In humans, these cysts typically measure between 1 and 15 cm in size. However, cysts exceeding 20 cm in diameter have also

been observed (7). They are most frequently located in the territory irrigated by the middle cerebral artery (8). Involvement of other organs, primarily the lung and liver, is seen in approximately 10% of cerebral hydatid cyst cases. Therefore, systematic investigation is required in patients diagnosed with cerebral hydatid cysts (4).

Clinical manifestations may vary depending on the patient's age, location of the cyst and its size (9). Symptoms such as headache, nausea, vomiting, papilledema, and cranial nerve palsy can arise due to increased intracranial pressure. Less common findings include vertigo, ataxia, focal neurological deficits, and seizures (2,3).

Imaging is the primary diagnostic tool (4). Cerebral hydatid cysts are typically visualized as large, unilocular, thin-walled, non-calcified cysts without surrounding edema, as seen in our patient (2). Computed tomography is superior to MRI in detecting calcification within the lesion, while MRI is better for assessing the exact location and anatomical relationships of the lesion. However, despite the use of advanced imaging techniques, diagnostic challenges remain (10). A cyst is characteristically visualized as a single, homogeneous, circular lesion with clear borders and isodense with cerebrospinal fluid. Other cystic lesions such as arachnoid cysts, cystic tumors, abscesses and porencephalic cysts should always be considered in the differential diagnosis (11). Indirect hemagglutination tests and other serologic tests are useful in diagnosis (12). Serologic tests are generally negative in primary cerebral hydatid cysts. However, they become positive in the presence of associated visceral lesions. Since indirect hemagglutination testing and enzyme-linked immunosorbent assays yield a sensitivity of 80%, a negative result does not exclude the diagnosis of hydatid cysts (13). No correlation has been established between the size and number of cysts and serologic tests (12). Cysts in the brain, bones, eyes, and calcified cysts do not usually cause any antibody response (7).

The optimal treatment option for cerebral hydatid disease is surgical excision of the cyst. The goal of surgical treatment is the complete removal of the intact cyst, as rupture can lead to the release of viable hydatid scolices which can cause anaphylaxis, cerebrospinal fluid dissemination, and recurrence. The success rate for intact removal of an intracranial hydatid cyst stands at around 60-70% (14). In our case, hydatid cyst was considered based on radiologic imaging and surgical cyst excision was performed. Adjuvant therapy with anthelmintic albendazole or praziquantel reduces the risk of secondary echinococcosis and recurrence (15). There is no definitive evidence available regarding the optimal duration of these agents employed in the treatment of hydatid cyst disease (16). In our case, we administered albendazole for three months following surgery.

In conclusion, cerebral hydatid cyst disease should be considered in the differential diagnosis of intracranial cystic lesions if the patient's history suggests potential exposure to the parasite.

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