

Unusual occurrence of brain hydatid disease in a patient with previous surgical intervention for hemorrhagic venous infarct

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ABSTRACT

Hydatid disease is an endemic parasitic disease and can occur anywhere in the body and has a variable presentation. On imaging, the lesions have varied appearance ranging from cystic to solid appearing lesions, solitary to multiples. We present a case of 35-year-old female who underwent decompression craniectomy for right temporoparietal hemorrhagic venous infarct and now presented with acute onset of right-sided weakness. Magnetic resonance imaging was suggestive of cerebral hydatid disease. The presented case emphasizes that hydatid cyst should be considered as a possibility whenever a cystic lesion is encountered during imaging.

Key words: Brain hydatid disease, Cerebral hydatid, Echinococcosis, Muscle hydatid disease, Paraspinal hydatid

Hydatid disease is a parasitic disease, which is endemic in many parts of the world [1-4]. The prevalence of the disease varies and is more common in countries where cattle and sheep raising are practiced. The prevalence is highest in temperate zones. The incidence varies from 1 to 220/100,000 population in endemic areas and the mortality rate ranges from 2% to 4% [5]. It can occur anywhere in the body. The disease most frequently occurs in the liver followed by lung, peritoneum, kidney, brain, mediastinum, heart, bone, soft tissues, spleen, and pleura. The disease has a variable presentation, and the symptoms mainly depend on the site of involvement and the pressure exerted on the surrounding tissues. The patient presents with abdominal pain, nausea, and vomiting when the liver is affected and chest pain, cough, and shortness of breath when the lungs are affected. Headache, dizziness, and decreased level of consciousness are seen in cerebral involvement. There are few nonspecific symptoms such as weakness, anorexia, and weight loss.

The imaging features depend on the stage of the disease, involved organ and associated complications [1]. The lesions have varied appearance ranging from cystic to solid appearing lesions. The cysts can be solitary or multiple and can be diagnosed on ultrasound, computed tomography, and magnetic resonance imaging (MRI). It is important for the clinicians and radiologists to know the various modes of presentation and sites of involvement for early diagnosis and treatment planning. This case report emphasizes that the hydatid cyst should be considered as a possibility whenever a cystic lesion is encountered during imaging.

CASE REPORT

A 35-year-old female, who underwent decompression craniotomy in January 2017 for right temporoparietal hemorrhagic venous infarct (Fig. 1), reported to the department with a complaint of acute onset of right-sided weakness 18 months later.

On general examination, the patient was conscious and coherent with a normal Glasgow Coma Score. The vitals were stable except for a mildly elevated blood pressure (140/100 mm-Hg). The routine blood investigations such as random blood sugar, serum electrolytes, and total leukocyte count were performed. There was a mild increase in the total leukocyte count while blood sugar levels and serum electrolytes were normal. Later, the patient was subjected to MRI to identify the cause of weakness.

MRI revealed multiple well-defined unilocular cystic lesions in bilateral frontoparietal, and right temporal and occipital lobes appearing homogeneously hyperintense on Type 2 (T2)-weighted images with a thin hypointense rim and appearing hypointense on FLAIR images (cerebrospinal fluid [CSF] signal intensity on all sequences). The largest lesion measures 3.5 cm×3.3 cm (AP×TR) in the left parietal region, and there was no surrounding edema (Fig. 2). The lesions were producing mass effect on the surrounding brain parenchyma and were also seen in the herniated brain parenchyma. There were no septations or debris within the lesions, except for the lesion in right occipital lobe which shows thin hypointense membranes within. Another similar small cyst noted in right cerebellar hemisphere. Cystic lesion measuring 2.7 cm×2 cm with similar imaging features also noted in paraspinal muscles on the left side at the level of C3 and C4 vertebrae (Fig. 3).

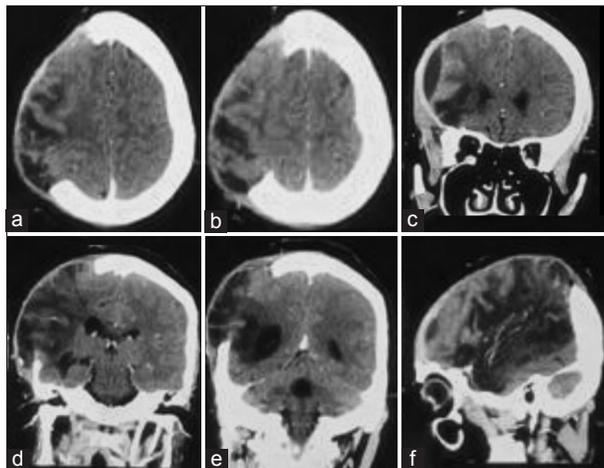


Figure 1: (a-f) Post-operative images after decompression craniectomy show right frontotemporoparietal craniectomy defect with gliotic changes in the underlying brain parenchyma. The brain parenchyma is seen herniating through the craniectomy defect

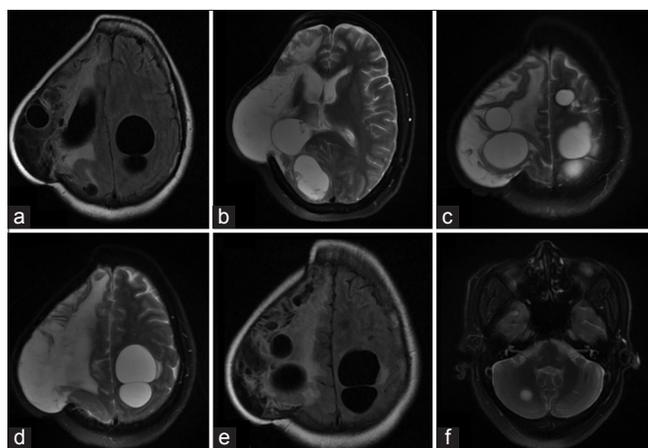


Figure 2: T1 (a and e) and T2 (b-d and f)-weighted magnetic resonance images showing multiple well-defined unilocular cystic lesions in bilateral frontoparietal region, right occipital lobe and right cerebellar hemisphere following cerebrospinal fluid signal on all sequences. Similar lesions also noted in the herniated brain parenchyma. There is a thin hypointense rim around the lesions

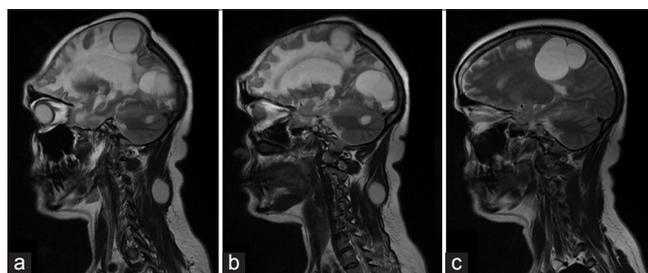


Figure 3: (a-c) Sagittal Type 2 weighted magnetic resonance images of the same patient showing a well-defined fluid signal intensity cystic lesion in the posterior paraspinal muscles on the left side at the level of C3 and C4 vertebrae

Based on these findings, the patient was diagnosed to have hydatid disease. The patient was given an option of surgical excision of cysts after explaining poor recovery and complications. Considering the amount of risk involved the patient has opted out of surgery and was managed conservatively.

The patient is on regular follow-up, and presently, she is asymptomatic.

DISCUSSION

Cerebral hydatid disease is a very rare entity and accounts for <2% of all intracranial masses and 3% of hydatid disease. The disease involves multiple organs and is more common in liver and rare in the central nervous system and soft tissues. MRI has been proved to be the best imaging modality for hydatid disease of the central nervous system [1,2,5,6]. There are two types of *Echinococcus* infections, of which *Echinococcus granulosus* is the most common and *Echinococcus multilocularis* is less common but more invasive. Dogs are definitive hosts whereas sheep are intermediate hosts [1,2,6,7]. Human beings are infected by intake of food or water contaminated by dog faces containing the parasite. Hydatid cysts are classified into four types on the basis of their appearance: Simple cyst with no internal architecture (type 1), cyst with daughter cysts and matrix (Type 2), calcified cyst (Type 3), and complicated cyst (Type 4) [4]. The hydatid disease has various presentations and can occur in any location.

They produce tumor-like symptoms, headache and seizures. The cysts are found to be located mostly in the middle cerebral artery territory. However, they can be seen anywhere within the brain, most common being supratentorial location and in the parietal lobe. As compared to adults, cerebral hydatid is more common in children [6,8].

On imaging, the cysts generally appear unilocular and have similar intensity to that of CSF. The fibrous capsule may show fine peripheral enhancement. As the lesions do not show surrounding edema and produce a significant mass effect on adjacent brain parenchyma, it is easy to distinguish them from other lesions of the brain such as cystic tumors or abscess. The characteristic finding is the presence of a hypointense rim on T2-weighted MRI [4,7,8]. The cerebral hydatid disease usually presents with a solitary cyst but may be multiple in numbers when the cyst ruptures spontaneously or due to trauma or surgery. The incidence of multivesicular cysts and calcification is very less in the brain [8,9].

The mass effect produced by the cysts is very prominent in the brain and the symptoms produced are due to compression of vital structures. The cysts, which are subcortical in location, can protrude into the meninges and cause calvarial erosion. The differential diagnosis to be considered for hydatid cysts are arachnoid cysts, porencephalic cysts, and epidermoid. Arachnoid and porencephalic cysts are not surrounded by brain tissue and are not spherical. Brain abscess and cystic tumors show significant rim enhancement and peripheral edema [2].

Hydatid cysts occurrence in soft tissues and muscles is also extremely rare. It is difficult for the cyst to grow in the muscle due to the contractility and presence of lactic acid. The muscles of the neck and the thorax are more commonly involved due to the increased vascularity and less usage of these muscle groups. The disease usually does not primarily occur in the muscles and is very rarely seen. It can have various appearances ranging

from unilocular cyst to calcified cyst [2]. Multiple cysts can be seen due to spontaneous rupture, trauma, and surgery. Edema in adjacent soft tissues is less common and can be seen secondary to compression or allergic reaction [9,10]. The low signal intensity rim is more evident on T2-weighted MRI, which is not a common finding elsewhere [11]. The differentials for a paraspinal cystic component include epidermoid, teratoma, cystic hamartoma, dermoid, neurenteric cysts, and Tarlov cyst [12].

CONCLUSION

Hydatid disease has varying imaging appearances and can occur in any part of the body. In our patient, there was a rare combination of hydatid disease of the brain and paraspinal muscles. Hydatid cysts also occurred in extracalvarial herniation encephalomalacic brain, which is extremely rare. Being familiar with the variable appearances and possibilities of occurrence provides an advantage in making the diagnosis, especially in endemic areas.

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