

MULTIPLE PRIMARY CEREBRAL HYDATID DISEASE IN ADULT; CT AND MRI DIAGNOSIS; CASE REPORT AND REVIEW OF LITERATURE

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ABSTRACT

The article was a presented case report of multiple primary cerebral hydatid cyst in adult man with review of relevant literature. Role of computed tomography (CT) scan and magnetic resonance imaging (MRI) in the diagnosis of the disease. Case presentation: 50 years old man presented with symptoms of raised intracranial tension. CT scan and MRI showed non-enhanced cerebral cystic lesions, with mild mass effect. Spiral CT scanner and MRI imager 1.5 T were the modalities of choice for diagnosis. Multiple primary cerebral hydatid cysts are very rare. CT scan and MRI were central to diagnose the disease, and revealed typical features of hydatid cysts. Complete cystic remove after craniotomy. The presented case is an adult man and with multiple primary cerebral hydatid cysts located in right temporoparietal lobe, which was rare case in the population. CT and MRI are accurate modalities and they are the easiest method for diagnosis of the disease. Multiple primary intracranial hydatid cysts in adult were rare and should be considered in epidemic area.

KEYWORDS: Intracerebral hydatid cyst, Primary, multiple, Adult, CT Scanner, MRI imager.

INTRODUCTION

Hydatid disease is a parasitic infestation. It is endemic in many parts of the world particularly in Mediterranean Countries including Turkey and Egypt, Middle East, Australia and South America. It is hyper endemic in North Africa including Libya, in Jordon, Iraq and Iran⁽¹⁻⁷⁾.

Intracerebral hydatid cyst is very rare. About 1-2 % of patients with hydatid disease have intracranial hydatid cyst. Majority of cases are in the pediatric population and young adult 70% to 80% of patients are children^(1-5,7-10).

The disease is caused by larval stage of the taenia echinococcus. The hosts are various carnivores, the commonest being the dog, and all mammals like sheep, cattle, goats and swine are intermediate hosts. Humans are infected through faeco-oral route by the ingestion of food and milk which contaminated by dog faeces containing ova of the parasite or direct contact with dogs. Eggs lose their envelop in stomach, and embryos are released which then pass through gut wall to the portal system and are carried to the liver where most of the larvae are entrapped and encysted. Some may reach the lungs and very rarely some may pass through the capillary filter of liver and lungs and enter into systemic circulation. There may even reach the brain⁽¹⁰⁻¹⁴⁾. Intracerebral hydatid cysts are usually located in supratentorial region. The parietal lobe is the most frequent site for primary cerebral hydatid cyst^(1,8,15,16).

Intracerebral cystic disease may be asymptomatic and discovered accidentally e.g. when X-ray or CT scan brain performed for cases of trauma⁽¹⁷⁾. Cysts

grow slowly subsequently symptomatic and clinical manifestations are caused by the involved organ.

Good diagnostic method to diagnose the disease are CT scan and MRI. CT determines the location, size and wall calcification of hydatid cysts in the brain. MRI becomes more widely used as it can show exact localization, number and other details that are not be seen on CT scan^(1,10,18-22).

Here a rare case of multiple primary cerebral hydatid cysts was reported and also reviewed the relevant literature with role of CT scanner and MRI imager in the diagnosis and providing definitive results.

Case presentation:

50 years old Libyan man was referred to Misurata Central Hospital with history of intermittent generalized headache, left side numbness and paraesthesia of the toes and later he developed vomiting.

He had been well until 6 months earlier. No history of fever, visual disturbance or any other symptoms. The central nervous system examination and routine laboratory analysis were within normal limits as well as normal ultrasound abdomen and normal CT chest and abdomen. No evidences of diseases in liver, lungs, spleen or in any extracranial cystic lesions. Echocardiogram roles out any congenital cardiac disease.

Scanning of the brain was performed with contrast material on CT scanner: GE-Hi-speed. MRI examination was performed without contrast on MRI imager: Siemens 1.5T.

In the presented case CT Scan demonstrated multiple, spherical, thin well-defined outlines cysts, with non-calcified walls, non-enhanced with contrast material and homogeneous density similar to CSF. Daughter cyst was seen inside of one mother cyst (figure 1).

MRI imaging showed round, smooth, well defined, thin-walled three multiseperated cystic lesions and

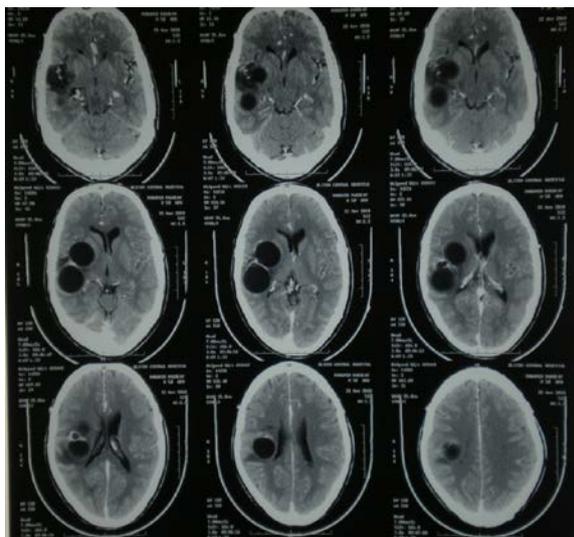
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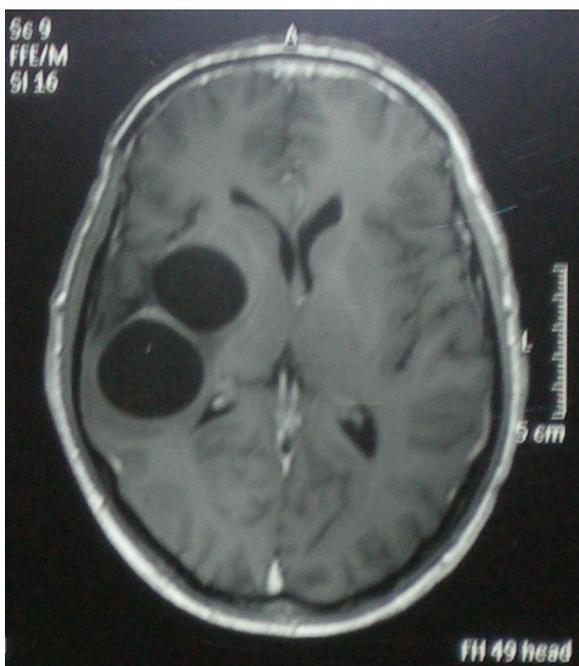
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MRI signal intensity similar to CSF, and the cysts located in the right temporoparietal region of the brain.

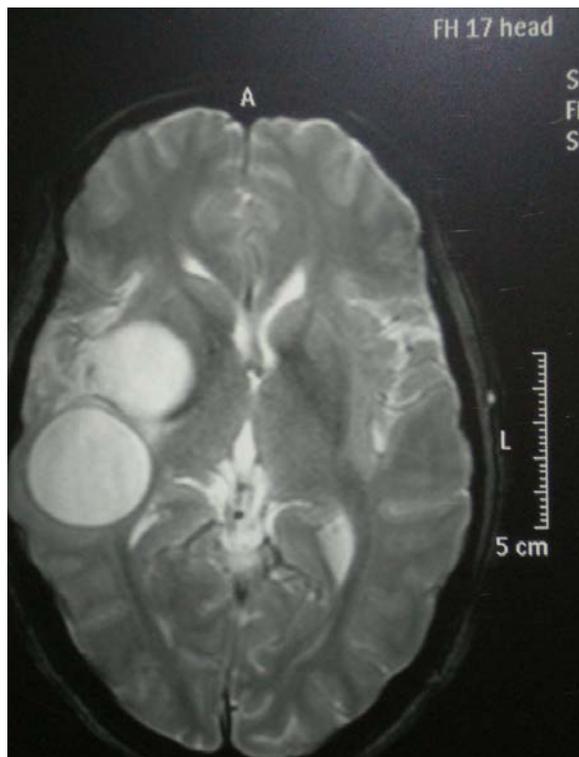


(Figure 1) CT scan with contrast showing multiple spherical cystic lesions with low density similar to CSF with smooth well defined wall and with daughter cyst inside of one mother cyst. No detectable calcification.

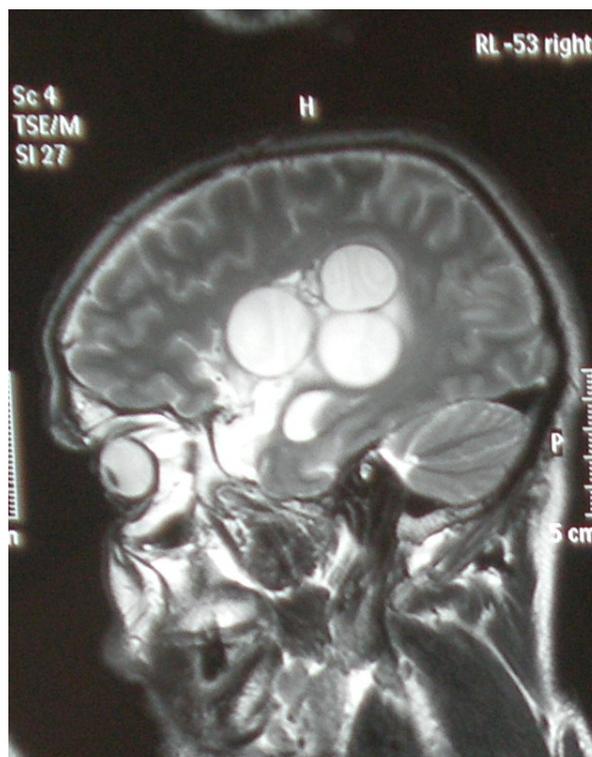
The three cysts were surrounded with brain parenchyma were shown at Sagittal T@ MRI. The measurements of cysts were about 3.5, 3.8 and 4.0 cm in dimensions. Mild mass effects on the right temporoparietal region and causes compression on the ipsilateral lateral ventricle. It subsequently causes mild midline shifts toward contralateral side. None of the cysts had collapsed membranes inside (figure 2). Post-surgical operation the specimen was obtained by neurosurgeon and sent to department of histopathology, finally confirmed the diagnosis.



(Figure 2-a) MRI axial T1WI



(Figure 2-b) MRI axial T2WI



(Figure 2-c) MRI sagittal T2WI

(Figure 2-a, b and c) the images showed 3 intracerebral cystic lesions with homogeneous high signal intensity on T2WI and low signal intensity on T1WI similar to CSF and smooth well defined outlines located at the right temporoparietal region.

DISCUSSION

Hydatid disease is endemic in Libya. Human gets infected through the faeco-oral route by ingestion of

food, water or milk contaminated by eggs of the parasite or by direct contacts with dogs. The eggs lose their enveloping layer in the stomach releasing the embryos. The embryos pass through the wall of the gut into the portal system and are carried to the liver where most of the larvae get entrapped and encysted. Direct infestation of the larvae in the brain after crossing the gastrointestinal tract, liver, lung and right side of the heart without affecting them^(10,12).

Intracranial hydatid cysts may be classified as primary or secondary. Primary intracerebral hydatid disease in adults is more less than in children. Primary hydatid cysts are usually solitary and secondary cysts are usually multiple. 90% of primary hydatid cysts are solitary^(4,7,23). Primary hydatid cysts are formed as a result of direct infestation of brain without evidence of involvement of other organs. Rupture of primary cyst usually results in recurrence. Secondary cyst results from traumatic, spontaneous and seen in extra-axial sites.

Intracranial hydatid cysts are slow growing and become symptomatic when become large. Usually the patients with large intracranial hydatid cysts present with focal neurological deficits and features of raised intracranial pressure may be due to interference with pathway of cerebrospinal fluid flow.

The patient came with history of headache, numbness and vomiting and no history of fever, no neurological deficits.

The patient had no history of contact with dogs. Ultrasound showed normal abdomen and no detectable pathological changes at liver, spleen and other abdominal organs, with normal CT scan chest and abdomen.

The definite diagnosis was provided by CT scanner and MRI imager.

CT scan brain and MRI brain obtained upon admission of our case and revealed typical features of multiple (three) hydatid cysts showed extra axial non-enhanced, spherical, smooth well defined outlines cystic lesions, located in the right temporoparietal region of the brain. CT scan density and MRI signal intensity on T1WI equal to CSF with no rim enhancement. Mild midline shift and mass effect. Daughter cyst was detected at anterior of the largest one of the cysts (figures 1 and 2).

Intracerebral hydatid cyst is rare^(6,10,16), about 1-2 % of all patients (children and young adults) with hydatid disease have intracranial hydatid cyst. Most of cases are in the pediatric population (70% to 80% of patients were children, and about 20% to 30% of patients were adults). About 0.3 to 0.7

% of adult patients with hydatid cysts have intracranial cysts.

The patient was an adult man with three cysts in cerebrum caused mild compression on the ipsilateral ventricle and mildly shifted the midline to the contralateral side. The presented case was with history of vomiting and numbness and he had no history of contact with dogs and other animals. Ultrasound and CT scan of abdomen and chest excluded extracranial hydatid cysts. CT and MRI brain showed typical multiseparated primary intracerebral hydatid cysts located at right temporoparietal region. In literature primary intracerebral hydatid cyst is a disease of pediatric and young adults groups and more less than in children. Most cases occurring in the first or second decade. Multiple primary intracerebral hydatid cysts are more less than solitary. The cysts are usually located at supratentorial and frequently located at parietal lobe of the brain. In this case the cystic lesions were removed by the right parietal craniotomy without intraoperative rupture. The specimens obtained by neurosurgeon and sent to histopathology, finally confirmed. Checkup CT scanning was performed for the patient after one year for follow up showed no lesion recurrence.

CT and MRI provided the characteristic features of the disease; size, shape, number, internal structures, contour and location of the lesions.

CT scan demonstrated spherical and smooth well defined thin walled homogeneous cystic lesions containing fluid with a density similar to CSF and calcification could be detected (figure 1). Calcification in cerebral hydatid disease is rare⁽⁹⁾, CT scan is better in detection of hydatid cystic calcification^(4,5). MRI is becoming more widely used as a diagnostic tool. MRI is superior to CT scan in detecting multiplicity and delineation of relationship of the cysts with adjacent cerebral parenchyma and demonstrating cyst capsule (figures 2).

In atypical CT findings in cerebral hydatid cysts may cause difficulty in CT scan interpretation and may confused with other diagnosis such as brain tumor or abscess. In these situation MRI including spectroscopy and diffusion sequences becomes the tool of choice for diagnosis of atypical or complicated intracerebral hydatid cysts⁽⁹⁾.

CT and MRI imaging are the modalities of choice and central to diagnose the intracranial hydatid cysts^(1,10,20). CT scan and MRI are non-invasive, fast, accurate, easily applied. Both are good for detection and localization of the lesion in the brain. CT and MRI not only increased diagnostic specificity but also allowed us to visualize the size, outermost outline, localization and multiplicity of the cyst are very important for the neuro-

surgeon, thus helping him to plan the cortical excision and approach the lesion accurately⁽⁷⁾.

CONCLUSION

Multiple primary intracerebral hydatid cysts in adult man is rare and hydatid cysts in the brain should be considered in patients living in endemic hydatid disease as one of the differential diagnosis in intracranial space occupying lesion. CT scan and MRI imaging are the modalities of choice for diagnosis of intracerebral hydatid cysts.

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