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IMAGING FEATURES OF LIVER HYDATID CYST DISSEMINATED INTO PELVIS

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Hydatid disease (HD) is a unique parasitic infection that is endemic in many parts of the world. Although the disease primarly affects the liver, HD can be encountered almost anywhere in the body depending on its hematogenous dissemination. In this case report, we describe a 61-year-old man who presented with abdominal pain and urinary complaints. Imaging studies revealed a huge liver and pelvic region lesions that exhibited characteristic imaging findings for type 3 HD. The second lesion was interpreted as occurring due to dissemination from the liver HD. Due to the extensiveness of the disease, both surgery and percutaneous drainage of the lesions were excluded and the patient was put on albendazole treatment.

Key-word: Liver, echinococcosis.

Hydatid disease (HD) is a parasitic infection and most frequently caused by Echinococcus granulosus. Echinococcus multilocularis is the cause of a less common, though more invasive form of the disease. Echinococcus granulosus has a worldwide distribution and is endemic in cattle-rising regions such as Mediterranean countries, Australia, the Middle and Far East, South America and Southern Asia. Increasing immigration has led to an increasing prevalence of the disease (1).

Although HD mainly affects the liver and the lung, due to its hematogenous dissemination it can occur anywhere in the body. It demonstrates a variety of imaging features that vary according to growth stage, associated complications and affected tissue. Imaging modalities including ultrasonography (US), computed tomography (CT) and magnetic resonance imaging (MRI) are useful for detailed characterization of the disease.

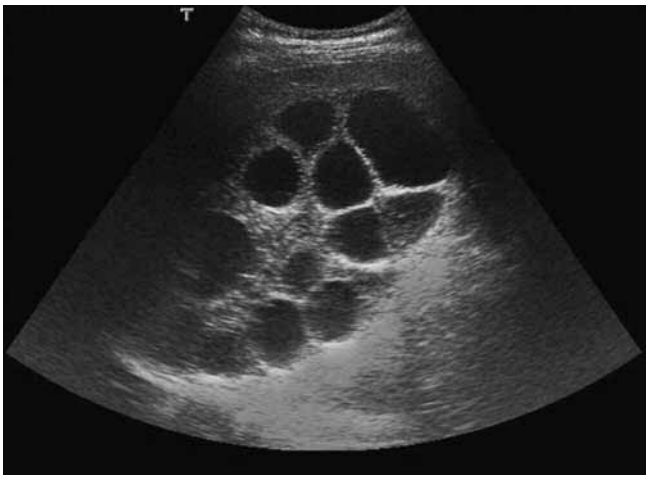

Fig. 1. — US image reveals multiple, hypoechoic cysts located in the right lobe of the liver demonstrating no vascularity.

Case report

A 61-year-old male patient applied to our hospital with abdominal pain and urinary complaints of several weeks duration. His physical examination revealed a palpable mass at the right quadrant. Laboratory tests including blood count, blood chemistry and urine analysis were within normal limits. The patient was referred to ultrasound (US) examination (Applio, SSA – 770; Toshiba, Tokyo, Japan). This revealed multiple, hypoechoic cystic masses with varying size in the right lobe of the liver showing no flow or increased vascularity during color doppler study (Fig. 1). In the differential diagnosis, multiple simple liver cysts versus HD of the liver was considered. We performed a contrast-enhanced abdominal CT imaging (Somatom Sensation 16, Siemens Medical Systems, Erlangen, Germany). A 20 x 13 x 12 cm hypodense mass containing multiple low attenuation cystic lesions were found in segment 6 of the liver. The mass exhibited a round configuration and extending inferiorly into the pelvic region while displacing the right kidney anteromedially (Fig. 2). Neither calcification nor contrast enhancement of the lesions were detected. There was also a second mass lesion measuring 17 x 14 x 10 cm in diameter in the pelvis, displacing the urinary bladder anteriorly. This lesion demonstrated similar CT imaging findings as the previous one. The CT imaging features of these lesions were very suggestive of a stage 3 HD according to the Gharbi classification. We thought that the second lesion developed from dissemination of the liver HD. The patient also underwent an MRI study for further delineation of these lesions using a 1.5 tesla magnet (GE, Signa, Milwaukee, Wisconsın, USA). On these images, multiple cystic lesions were found showing low signal intensity on T1 weighted images and high signal intensity on T2 weighted images (Fig. 3) without contrast enhancement in the liver and pelvis consistent with type 3 HD.

After the imaging diagnosis of HD we also performed an indirect hemagglutination test which resulted positive for Echinococcus granulosus. Due to the extensiveness of the disease, surgery or percutaneous drainage of the lesions were not recommended. Medical treatment

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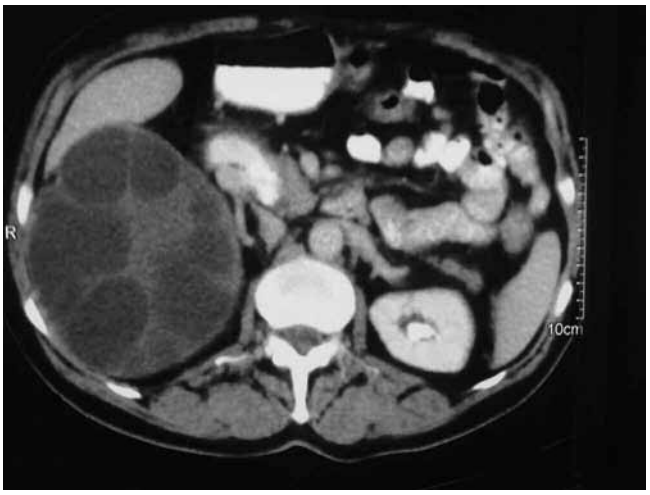

Fig. 2. — Axial CT image, A huge hypodense mass with multiple low attenuation cystic lesions. The mass shows no contrast enhancement and has an exophytic extent into the pelvis.

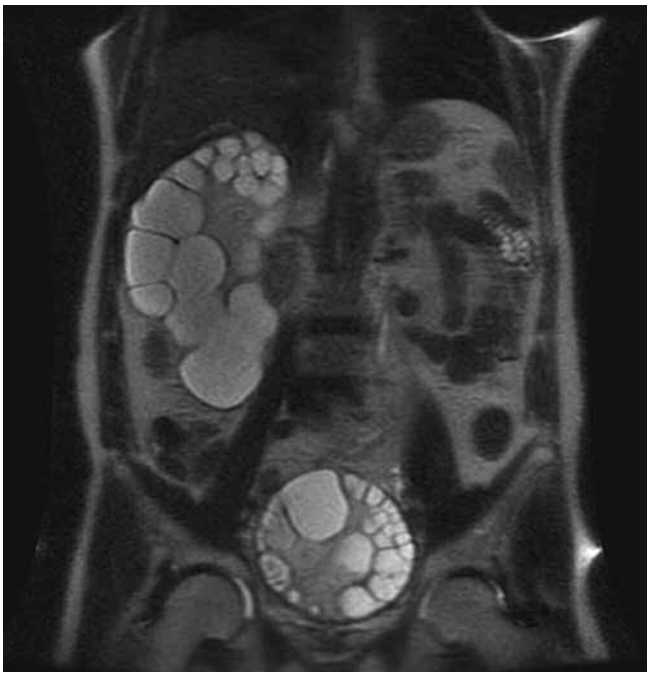

Fig. 3. — Coronal FSE fat-suppressed T2 weighted image exhibits two round-shaped mass lesions located in the liver and pelvis containing multiple high signal intensity daughter cysts.

with Albendazole was initiated (15 mg/kg/day x 2) and the treatment was planned for 6 months.

Discussion

HD is a parasitic infestation caused by Echinococcus granulosus, the life cycle of which has been well defined. The liver is the most frequently involved organ (75%), followed by the lung (2). Hydatid cysts can be solitary or multiple. Chest radiography, US, CT, MRI and even urography can depict these lesions. Radiologic and serologic findings can generally help establish the diagnosis of HD, but a hydatid cyst in an unusual location with atypical imaging findings may complicate the differential diagnosis (3).

Radiological imaging is useful in rendering the diagnosis, showing the size, location, relationship to adjacent organs, and type of the cyst. It can also be used to search for another hydatid location. The radiological findings of a thick cyst wall, calcifications, daughter cysts and a germinative membrane separated from the cyst wall are all specific to hydatid cysts (4). Gharbi classification (5) is widely used for hydatid cyst disease and divided into five categories as below:

Type 1- Pure fluid collection – univesicular cyst,

Type 2- Fluid collection with a split wall – detached laminated membrane – 'water lily' sign,

Type 3- Fluid collection with septa – daughter cyst,

Type 4- Heterogenous appearance – presence of matrix – mimics a solid mass,

Type 5- Reflecting thick walls – calcifications.

A solitary type 1 hydatid cyst may be difficult to distinguish from a simple epithelial cyst on the basis of imaging findings alone. The presence of multiple echogenic foci that fall into the dependent portion of the cyst when the patient is repositioned is a characteristic US finding. Simple epithelial cysts do not demonstrate internal areas of increased echogenity. When there are multiple unilocular cysts and other organs are involved (eg, pancreas, spleen), polycystic liver or kidney disease is a possible diagnosis. The differential diagnosis can be made when hereditary factors and a history of living in endemic regions are taken into consideration along with these imaging findings.

Calcification is seen on radiography in 20%-30% of hydatid cysts and usually manifests with a curvilinear or ringlike pattern representing calcification of the pericyst. During the national evolution toward healing, dense calcification of all components of the cyst occurs. This can indicate the death of the cyst (6). CT and conventional radiography are the best modalities for detecting calcification. Intravenous administration of contrast material is not necessary unless complications are suspected, especially infection and communication with the biliary tree.

US is regarded to be the most sensitive modality for the detection of membranes, septae and hydatid sand within the cyst. Although US is the initial diagnostic tool for HD, CT is more useful in terms of revealing calcification and detecting daughter cysts and therefore is regarded to be more sensitive and accurate than US in the differential diagnosis (7). Typical CT findings include sharply defined, single or multiple, round or oval cystic masses with fluid attenuation values (3-30 HU) and a thin high attenuation rim that usually does not enhance after the administration of contrast material. Daughter cysts may produce a multilocular appearance. Separation of the laminate membrane from the pericyst produces a 'split-wall' or 'floating-membrane' appearance. This separation does not necessarily indicate death of the parasite.

On MRI, hydatid cysts typically appear as multiloculated or multicystic, with a hypointense rim on T2 weighted images. This finding may be helpful in differentiating a hydatid

cyst from other cystic lesions. It probably represents the collagen – rich outer layer of the hydatid cyst and is generated by the host (8). When present, daughter cysts are seen as cystic structures attached to the germinal layer that are hypointense relative to the intracystic fluid on T1 weighted images and hyperintense on T2 weighted images (8).

Although a few unusual cases of primary peritoneal involvement have been described, peritoneal hydatic cysts are almost secondary to hepatic involvement (9). Hydatid cyst may use the natural routes provided by the liver capsule, ligaments and peritoneum to progress beyond the boundaries of the liver. The overall prevalence of peritoneal involvement in cases of abdominal HD is approximately 13%. Most of these cases are related to previous surgery for hepatic hydatid cyst, although spontaneous, asymptomatic microruptures of hepatic cysts into the peritoneal cavity are not uncommon (12% of cases) (9).

The best treatment option is complete surgical excision of the intact cyst which avoids leakage of cyst content that can cause anaphylaxis and local recurrence (10). Medical treatment indications are inoperability, recurrence and extrahepatic disease involvement (11). Albendazole is used for the medical treatment of HD. The usual dose of orally – administered albendazole is 10-15 mg/kg/day in two divided doses. Treatment is typically administered as 1-6 monthly cycles separated by 10-14 day intervals. Percutaneous treatment under US guidance is another option in selected cases, although anaphylactic and allergic reactions due to spillage of the cyst contents have occured. Surgical therapy may cause to morbidity, mortality or recurrence in some cases. Therefore medical therapy can be selected in uncomplicated cysts and in patients who have high risks for surgery (12).

In conclusion, HD primarly affects the liver and usually demonstrates typical imaging findings but secondary involvement can occur depending on hematogenous dissemination in any part of the body that the bloodstream reaches. Therefore, HD should always be remembered in differential diagnosis, whenever a cystic lesion is found in an unexpected location of the body.

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