

HYDATID DISEASE OF THE LIVER EVALUATION OF ULTRASOUND AND COMPUTED TOMOGRAPHY

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ABSTRACT:

We have evaluated computed tomography (CT) and ultrasonography (US) in 41 patients with hepatic hydatid disease, CT was diagnostic in all patients while US performed on 36 patients & was diagnostic in 34. In the remaining two cases, heavy calcification in one and a large amount of intracavity air in the other prevented accurate diagnosis.

The US finding in the liver regarding cyst form (Multilocular or unilocular), size and location were compared to those of CT. CT detected extra hepatic cysts in the abdomen and pelvis in 11 patients, while US performed on the same group of patients detected such cysts in seven patients only. We suggested that the entire abdomen and pelvis should be scanned in patients suspected of hydatid disease and when the hepatic lesion is suggestive of the disease.

INTRODUCTION:

Hydatid disease due to *Echinococcus Granulosus* is endemic in sheep-raising countries such as Australia, New Zealand, parts of Africa and South America. Manson et al., (7) and is also prevalent in the Middle East in Iraq, Syria, and Saudi Arabia (Ismael et al., (5)., Noah et al., (9).

Cysts can occur anywhere in the body but the liver is the most common site (Choliz et al., (2). Diagnosis is mainly radiological and serological.

Several reports documents the efficacy of CT ad US of the liver in hydatid disease. There is however little information in the literature comparing the efficacy of these two methods in the same patients. The aim of the this study was to compare the sensitivity of US and CT in diagnosing hydatid disease.

PATIENTS and METHODS:

The hospital records of 41 patients with a diagnosis of hydatid liver disease

seen at Assir Central Hospital, Madina National Hospital in Saudia Arabia, Al-Hussin and Bab Al-Sharia University Hospitals were reviewed. There were 12 male and 29 female patients aged 15-85 years (average 52 years) the diagnosis was confirmed by serology in all patients.

All 41 patients had a CT scan of the abdomen and pelvis on GE 9800 scanner. In 36 patients contiguous 10 mm thick scans were obtained and in five patients scans were obtained at 15 mm interval and 10 mm collimation. All except five patients received an intravenous bolus of 50 ml of sodium iothalamate (420 mg/ml). All patients received oral contrast media. Thirty six patients had abdominal US and four of these also had pelvic US. A commercially available high resolution real time scanner (GE RT 3000) with 3.5 MHZ transducer was used.

Plain radiographs of the abdomen and chest were obtained, for all patients, all scans and plain radiographs were reviewed.

RESULTS:

Computed Tomography:

CT demonstrated hepatic cysts in all cases, the cysts were smoothly marginated, thin walled, spherical or oval masses of low attenuation ($0-14 \pm 4$ Hounsfield units) the cysts were unilocular or multilocular (Fig. 1 a & b)

Single cysts were found in 36 cases (88%), two cysts were present in four cases (10 %) and multiple cysts in one case (2 %). (Fig. 2).

Cysts were in the right lobe in 24 cases (58.5 %), in the left lobe in 11 cases (26.8 %) and in both lobes in six cases

(14.6 %). Daughter cysts were present in 22 cases (54 %), while unilocular cysts were present in 19 cases (46 %). Calcification were mural and curvilinear in seven cases, ring-like in four cases and conglomerate intercystic in three cases (Fig. 3).

Complications were recognized in three cases (7.3 %), (Fig. 4). Intracystic infection with a thick ill defined wall and an air fluid level was noted in two cases and one case had ruptured through the right hemi diaphragmatic causing a right pleural effusion.

Associated extrahepatic cysts were noted in the abdomen and pelvis in 11 cases (27 %), table 1.

Three were in the mesentery, two were in each of the right kidney and spleen, and one in each of the omentum, right ovary and pancreas (Fig. 5). There was no intravenous contrast media used.

Table 1: Distribution of extra hepatic hydatid in the abdomen in the abdomen and pelvis.

Site	No. of cases detected by CT	No. of cases detected by US
Abdomen		
Mesentery	4	2
Spleen	2	2
Kidney	2	2
Pancreas	1	1
omentum	1	-
Pelvis		
Ovary	1	1
Total	11	8

ULTRASOUND:

Ultrasound was diagnostic in 34 out of 36 patients, in the remaining two cases, heavy calcification in one and large amount of intracavitary air in the other prevented accurate diagnosis (Fig. 7 & 8). Each of the positive patients showed one or more of the following ultrasonographic features of hydatid disease: A well defined echo-poor cyst with posterior enhancement was shown in 11 patients while a multilocular appearance as a result of daughter cysts were present in 22 cases. The ultrasonographic water lily signs was shown in two cases and a fluid level owing to hydatid sand was recognized in one patients.

Cysts calcification was detected in 12 patients compared with 14 patients detected by CT in the same group of patients. Of the 11 cases of associated extrahepatic cysts detected by CT in the abdomen and

pelvis, US detected such cysts in eight patients, though in two of them the cysts were incorrectly localized. One of these was a hugely splenic cyst thought to be in the left hepatic lobe and the other was a cyst in the upper pole of the right kidney. Which was incorrectly thought to be part of a large posteriorly placed right hepatic cyst.

The remaining four cases that were not detected by US were clinically unsuspected small abdominal cysts that were related to bowel. Three cases were in the mesentery and one was in the omentum.

CT did not shown any extra hepatic cysts in five patients who were not examined by US.

Plain abdominal radiograph: calcifications were noted in seven cases (14 %) and only two patients had pulmonary cysts (4.9 %) (Fig. 6).

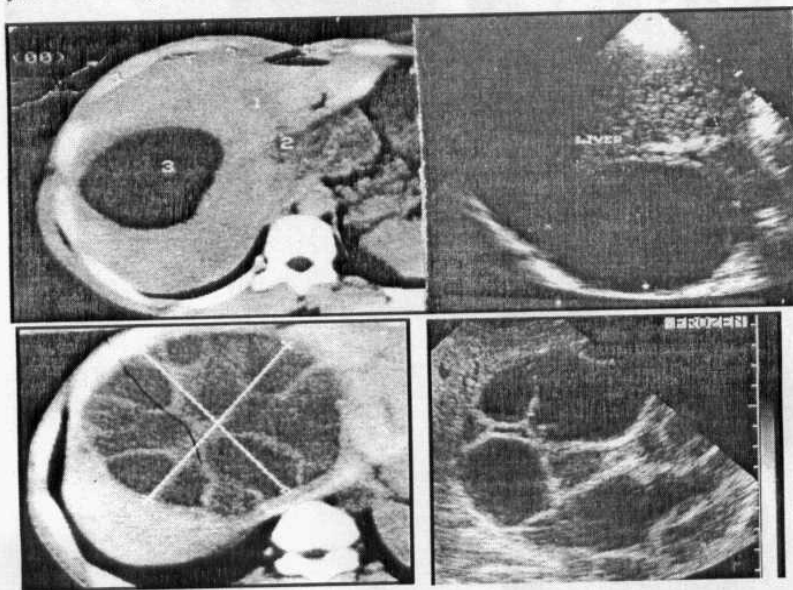


Fig. 1: US and CT showed unilocular hydatid cyst of the liver (a), and multilocular in (b).

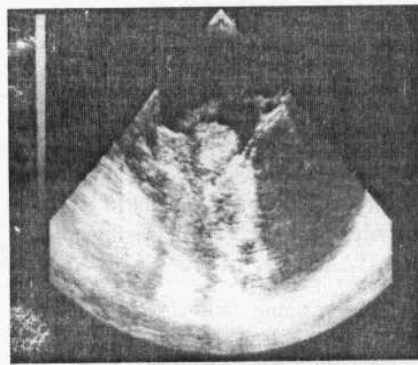


Fig. 2: Multiple hydatid cyst of the liver as seen by CT and US.

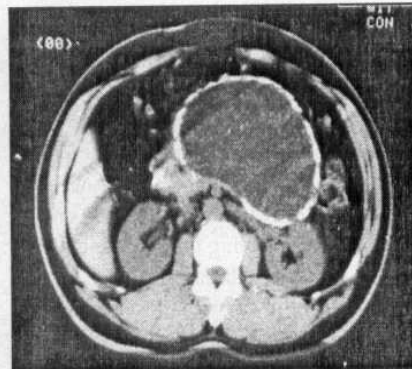


Fig. 3: Calcification of the hydatid cyst.

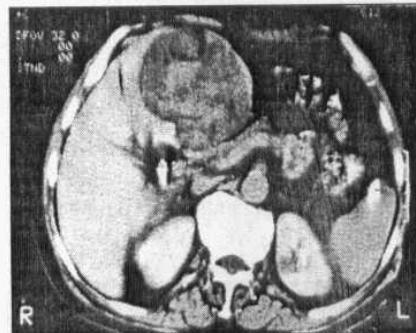


Fig. 4: Complicated hydatid cyst.

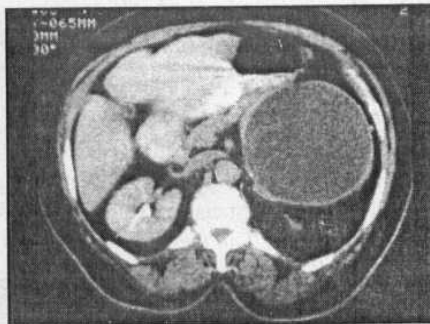


Fig. 5: Mesenteric hydatid cyst seen by CT only.

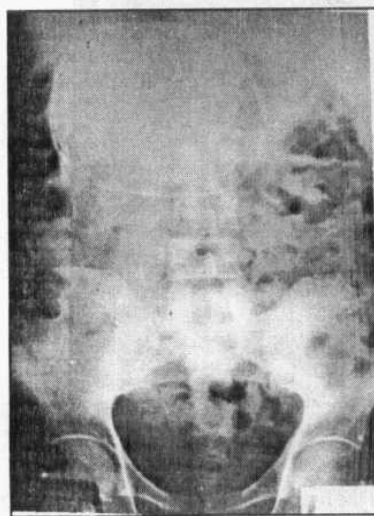


Fig. 6: plain x-Ray abdomen showed calcified wall of hydatid cyst.

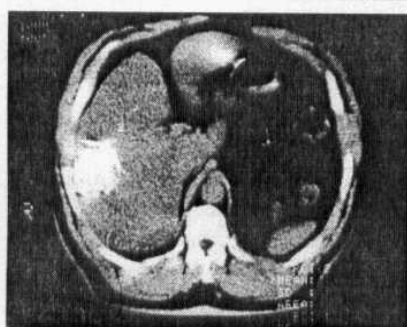


Fig. 7: Heavy calcification of hydatid cyst as seen by US.

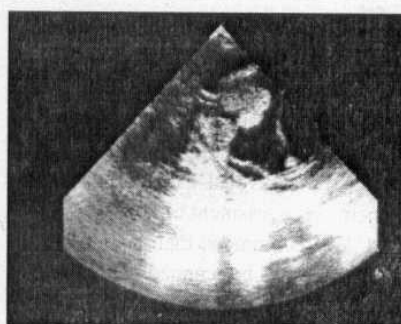


Fig. 8: Infected cyst as seen by US.

DISCUSSION:

The CT scan appearance of the hydatid disease includes sharply marginated single or multiple rounded or oval cystic masses of fluid density (3-30 HU) and a thin dense rim, which does not enhance following intravenous contrast medium (2 & 10).

A multilocular appearance as a result of daughter cysts and cyst calcification are frequent findings.

US shows a well defined echo-poor cyst with distal enhancement, which may be indistinguishable from a simple developmental cyst but this appearance must be highly suspect in endemic areas (1 & 6). Multiple daughter cysts produce a multilocular appearance (4).

The split wall sign is due to the separation of the laminated membrane from the pericyst, this is seen ultrasonographically as an echo-poor layer between the germinal layer and the pericyst (3). The water lily sign is due to detachment and collapse of the germinal layer which is seen on US as an undulating linear collection of echoes either floating in the cyst fluid or lying in the most dependent part of the cyst (8).

A fluid level may be produced by hydatid sand (brood capsules and freed scolices) which sinks to the most dependent part of the cyst (8). This findings is however of limited diagnostic significance since debris within an abscess or necrotic tumor could also produce a similar US appearance.

Our findings indicate that CT is superior to US in the diagnosis of hepatic cysts and the detection of associated abdominal cysts particularly small ones. However, the two techniques are equally accurate in detecting pelvic cysts.

CT is also more accurate in the detection of calcification and infection, which may affect the typical US pattern of hydatid cyst. Of the two hepatic cases misdiagnosed by US in this series one was a small heavily calcified cyst in which the calcification concealed the cystic nature of the mass and produced a strong acoustic shadow which led to the wrong diagnosis of granuloma.

The other was an infected cyst with a large amount of intracystic air which prevented accurate diagnosis. Although CT is superior to US in the diagnosis of hepatic and associated abdominal hydatid

cysts and their complications, US share many of the advantages of CT but is safer, less expensive and more readily available.

We therefore suggest that US should be the initial investigation and that CT be reserved for equivocal cases and for the pre-operative assessment of hepatic hydatid cyst. We recommend that the entire abdomen and pelvis be scanned when hydatid disease is suspected or when a hepatic lesion is suggestive of disease.

We also recommend that plain radiographs of the abdomen and chest be obtained to detect hepatic cyst calcification and pulmonary cysts, although only two patients in this series had associated pulmonary cysts.

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تقييم أكياس الكبد الهيداتيديّة باستخدام الموجات فوق الصوتية والاشعة المقطعية بالكمبيوتر

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أجري هذا البحث علي إحدوي وأربعين مريضاً ممن يعانون من أكياس الكبد الهيداتيديّة . . ومن البحث انضح أن الأشعة المقطعية كانت مشخّصة لجميع الحالات ، بينما الموجات فوق الصوتية أظهرت الأكياس في ٣٤ فقط - وقد فشلت الموجات فوق الصوتية في تحديد كونيّة الأكياس الهيداتيديّة التي لم تظهر نظراً لوجود تكلس علي جدرانها . ولقد قورنت النتائج التي حصل عليها من الأشعة المقطعية والموجات فوق الصوتية من حيث عدد الأكياس وحجمها وموقعها ووجد أن الفحص باستعمال الأشعة المقطعية اكتشف إحد عشر كيساً بالبطن والحوض خارج الكبد بينما الموجات فوق الصوتية اكتشفت سبعة أكياس فقط من نفس مجموعة البحث . ولهذا نوصي بأن بفحص البطن والحوض سواء باستعمال الموجات فوق الصوتية أو لأشعة المقطعية حيثما يكون هناك شك في الإصابه بأكياس الكبد الهيداتيديّة .