ROLE OF RADIOLOGY IN THE DIAGNOSIS AND MANAGEMENT OF HYDATID DISEASE OF THE LIVER

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ABSTRACT

Twelve patients with hepatic hydatid cysts were studied for radiological features. All had undergone plain radiography abdomen (AP view) and ultrasound study. Six patients had undergone computerised tomography (CT). On plain radiography, curvilinear calcification was the only important positive finding (3 cases). Ultrasonographic findings were - single thick walled cyst (2 cases), multiple cysts (3 cases), multilocular cysts (3 cases), internal septum/floating membrane (2 cases), hydatid sand (1 case), and ill-defined cyst (1 case). CT findings of 6 patients were : single cyst (2 cases), multiple cyst (1 case), multilocular cysts (1 case), and ill-defined cysts (2 cases).

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KEY WORDS : Hydatid cyst; Ultrasonography; Computerised tomography.

Introduction

Liver hydatidosis is not considered by some authors to be a benign disease as it is progressive, recurrent and gives rise to life-threatening complications. It has a mortality rate of 10% in recurrent disease. Better understanding of the natural history and imaging of hydatid cysts of the liver has shed more light on the problems of local recurrence and formation of biliary fistulae.

The primary hosts of *Echinococcus granulosus* are dogs and the intermediate hosts are sheep, cattle and horses. The worm, which is 0.5 to 6 mm long, gains access to the body of the intermediate host, man, by penetrating the intestinal wall and entering the portal circulation. It may lodge in the liver or pass on to the lungs or other body organs. Cysts are found most commonly in the liver and lungs. They may become very large without causing symptoms and long-standing cysts may become calcified. More than half of all hydatid cysts occur in the liver, majority in the right lobe.

Improved techniques of imaging like ultrasonography (US), computerised tomography (CT), magnetic resonance imaging (MRI), apart from conventional radiography, have made the diagnosis simpler and more specific as regards the site and complications of cyst.

Material and Method

This study consists of 12 patients with hydatid cysts proved at surgery over a period of 18 months. All the patients were subjected to ultrasound with a 3.5 MHz transducer. Six patients had undergone CT. All the 12 patients had undergone radiography of the abdomen, antero-posterior view, prior to US and CT examination.

Results

There were 4 males and 8 females with age ranging from 16 years to 62 years. The majority of the patients were symptomatic (Table 1). One of the male patients, 16 years of age, reported with lump in the left iliac fossa. US examination revealed an ectopic malrotated

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left kidney with multiple hydatid cysts in the liver.

TABLE 1
Clinical presentation

Symptoms	no of Patients
Abdominal pain, discomfort, distension	5
Abdominal pain, discomfort plus plain film calcification	2
Asymptomatic plain film calcification	1
Hepatomegaly	2
Fever	1
Jaundice	1
Total	12

Plain radiology of the abdomen

Curvilinear calcification was visible in three patients (Fig 1). Live scolices were obtained at laprotomy in two of the three patients.

Ultrasound scan

All the twelve patients underwent an ultrasound scan (Table 2). Two patients had single thick walled cysts without distal enhancement (Fig 2). Two patients had a single cyst which contained a fluid level and another cyst had a large echogenic daughter cyst protruding into it. Three patients had multilocular cysts while another three had multiple liver cysts. One patient had a cyst which contained calcification and internal echogenic area.

Fig. 1 : Plain film - Dense irregular calcification.

TABLE 2
Ultrasound and CT appearance

	Ultrasound No of patients	CT No of patients
Single thick walled cyst	2	2
Multiple cyst/daughter cysts	3	1
Multilocular cysts	3	1
Ill-defined cysts	1	2
Internal septum/floating membrane	2	-
Hydatid sand	1	-
Total	12	6

Computed tomography

Six patients were examined by CT (Table 2). Two had single well defined cysts and one of these had a thin rim of higher attenuation.

Fig. 2 : Longitudinal ultrasound scan. Shows a unilocular hydatid cyst.

Fig. 3 : CT Scan : Shows two hydatid cysts in the right lobe of liver.

One patient had multiple cysts in the liver and peritoneal cavity. One patient had a multilocular cyst (Fig 3). Two patients had ill defined cysts with irregular walls, non-homogenous contents and partly calcified walls. One of these was found to be infected at surgery.

Discussion

Calcification was the only significant plain film finding in this series. However, large or multiple cysts can produce hepatomegaly or localized or diffuse deviation of the hemidiaphragm [1]. Cysts rupture through the diaphragm and can cause pleural effusion or a bronchobiliary fistula [2]. Calcification (Fig 1) was recognised in three (25%) patients in this series and has been reported to occur in about 30% of hepatic hydatid cysts. It is usually curvilinear or ring-like and lies in the pericyst. Daughter cysts may calcify, producing multiple small ring of calcification. Calcification has been said to imply death of the cyst and scolices [3].

The ultrasound appearance of hepatic echinococcosis have been described by Itzchak, Niron, Hadidi and Walther [4-7]. A single well-defined anechoic cyst with distal acoustic enhancement is indistinguishable from a simple developmental cyst, but this appearance must be highly suspect in an endemic area [4]. Thick walled cysts have also been described [8]. A fluid level within the cyst is due to 'hydatid sand' (freed scolices and brood capsules) which sink to the most dependent part [5].

Mural calcification is highly suggestive of hydatid disease [4]. Calcification can also occur within the cysts [6]. Separation of the laminated membrane from the pericyst produces a split wall or floating membrane appearance. Complete collapse of the endocyst produces an ultrasound 'water-lily sign' when the collapsed endocyst lies or floats in the most dependent part of the cyst.

Daughter cysts appear, initially, as localised thickening of the cyst wall or small, solid, echogenic areas [8]. As they mature and become cysts the pressure within the parent

cyst increases and this may distort the shape of the daughters. Multiple daughter cysts produce a multiloculated appearance [6].

The CT appearances which have been described include well-defined single or multiple cysts, calcification which can be nodular or curvilinear and a multilocular appearance due to daughter cysts [3,7]. The cyst may have a dense rim or white line which can enhance [3]. The attenuation value of hydatid cyst fluid varies from 3 HU to 30 HU [7]. Infected cysts are ill-defined and may contain air or have layering.

Surgery remains the treatment of choice. Accurate pre-operative localization is essential. The residual pericyst cavity does not collapse because of its rigid wall [9]. Cavities reduced by internal suturing appear cystic on ultrasound and as low attenuation areas on CT. Cavities which are packed with omentum appear hypoechoic but there is no distal enhancement on ultrasound examination. The presence of fat containing omentum in the cavity is recognised by negative CT attenuation. Cavities which are drained and heal by granulation have an echogenic appearance on ultrasound.

A recent multicenter study conducted by the World Health Organisation has suggested that medical treatment be restricted to inoperable cases or to the prevention of post-operative recurrence [10].

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