

## A Heavily Giant Calcified Hydatid Cyst of the Liver with Thoracic Involvement; The Role of Imaging in Prompt Diagnosis

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**Abstract:** Hydatid disease - a common disease in the tropics is caused as a result of infection by tapeworm. The disease is widely spread due to close association with sheeps and dogs. This disease affects different parts of the body with liver and kidney being the commonly affected parts. We present to you a 42-year old man with Hydatid disease with history of abdominal mass occupying his entire right upper abdominal quadrant with associated pain. Imaging modalities such as Ultrasound and Computed Tomography (CT) scan played a vital role in diagnosing this disease.

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### I. Introduction

Hydatid disease is common in the tropics. It is caused by infection with the larval stage of Echinococcus tapeworm [1]. Infestation of humans, who are accidentally the intermediate hosts, occurs from ingestion of water or food contaminated by fecal material of definitive host (dog, wolves, deer, sheeps) [2]. Hydatid disease is a relevant health problem in underdeveloped areas where veterinary control does not exist [1]. The most frequent organ of involvement is the liver in up to 70%, followed by the lung about 18% and with a lower reported incidence in other organs or tissues in the body [3]. It primarily affects the liver and shows typical imaging findings. However clinical presentation varies widely and is non specific [4]. Thus imaging plays an important role in diagnosis of hydatid diseases. Ultrasound (US), computed tomography (CT), and magnetic resonance imaging (MRI) can depict hydatid disease [5]. The imaging methods used depend on involved organ and the radiological findings which range from purely cystic lesions to completely solid appearance [6]. Ultrasound is the screening method of choice and is also used to monitor efficacy of medical therapy [5]. Computed tomography should be performed because of its high sensitivity of about 95% and as a diagnostic tool to determine vascular, biliary or extra hepatic extension, to recognize complication such as rupture and infection and also assess extend of resectibility [7]. Magnetic resonance is the best imaging procedure to determine a cystic component, to also help to determine vascular or biliary tree involvement as well as extra hepatic extension [8]. We hereby report a heavily calcified giant hydatid cyst with atypical imaging findings and also analyze the challenges using various imaging modality.

### II. Case Report

A 42year old Nigerien man, who was referred from Niger Republic Hospital to Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto, came to Radiology department with a history of abdominal mass occupying his entire right upper abdominal quadrant with associated pain. No jaundice or body itching. A clinical diagnosis of hepatic mass to rule out renal involvement was made. Ultrasound scan done in our department showed a huge hyperechogenic mass with extensive posterior acoustic shadow that prevented visualization of right hemi abdominal organs. An ultrasonographic impression of a huge calcified right hypochondrial mass was made, being non remarkable and inadequate, a complementary plain abdominal radiograph was done which show a huge somewhat elongated, multilobulated ground glass calcified mass extending to the lower abdomen with thoracic involvement and associated scoliosis with concavity to the right was demonstrated. Subsequently an abdominal CT was performed and shows a huge heavily calcified multi concentric mass lesion with a suggestion of a daughter component in the right lobe of the liver. A smaller but separate heavily calcified component is also seen rising out of the abdomen into the chest to involve the lung and pericardium with displacement of the heart. An impression of a giant heavily calcified hydatid cyst with

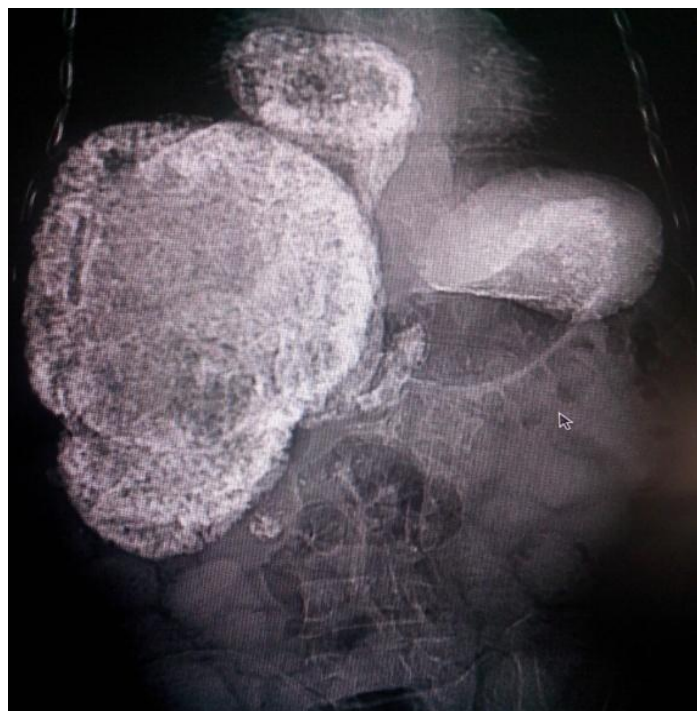
thoracic involvement and features of chronic hepatic inflammation was made. Patient was said to have had surgery at a hospital in his home country (Niger Republic) and lesions were removed. Histology confirmed hydatid disease of the liver.



**Figure 1:** Contrast enhanced axial CT showing a huge multi concentric calcified mass with central core of hypo to iso density HU=37 and a smaller component demonstrated in the right lobe of the liver. The liver is enlarged and show lobulated outline.



**Figure 2:** Ultrasonogram showing a thick echogenic arc with associated posterior acoustic shadow is demonstrated in right hypochondrial region preventing visualization of other intra abdominal organ in the right hemi abdomen.



**Figure 3:** CT scannogram showing a giant elongated, multilobulated calcified mass in the right hemi abdomen extending to the lumbar region and extension into the thorax. Associated scoliosis with concavity to the right is noted.

### III. Discussion

Hepatic hydatid cyst is a helminthic arthropozoonosis with worldwide distribution due to close association with sheep and dogs. It can occur almost in any part of the body with a variety of imaging features which may change according to the growth stages, associated complications and affected tissue [9]. The liver and lung are the common organs of involvement. In the liver the right lobe is most frequently involved portion because embryo of the ova of the organism passes from the duodenum through the mucosa to reach the liver through portal venous system where they form cyst [3, 9]. A definitive diagnosis of this disease required a combination of imaging, serologic and immunological studies [9]. Ultrasound, computed tomography and magnetic imaging are highly accurate in detecting hydatid cyst [10]. Hepatic hydatid cyst of an unusual dimension with atypical imaging findings may complicate the differential diagnosis as seen in this patient [11]. Other differential of calcified hepatic lesions are hepatocellular carcinoma, calcified liver abscess or amebic cyst. Giant hepatic hydatid cyst has exophytic growth through the natural routes provided by the liver capsule and ligaments. It has been revealed that the largest giant hydatid cyst of the liver was 37x14.8x15cm in size. However in this patient it measured 19.5x15x14cm in size [12]. Hepatic hydatid cyst usually shows cystic wall calcifications and internal calcifications of the matrix and ultrasound reveals hyperechoic or echogenic contour with cone shaped posterior acoustic shadow but when the cystic wall is heavily calcified only the anterior portion is visualized as a thick arc with posterior acoustic shadow [11]. In this case it shows a huge echogenic structure occupying the entire right hypochondrium with extensive posterior acoustic shadow preventing the visualization of the intra abdominal organs in the right hemi abdominal quadrant which make it difficult to ascertain the organ of involvement. Ultrasound is one of the best imaging modality of choice for the staging of evolution of the hepatic hydatid cyst [13]. Ultrasound in this case has been demonstrated to have limitation in identification of a giant and heavily calcified hydatid cyst. Plain radiograph of the abdomen may reveal a thin calcification in 20 to 30% of hepatic hydatid cyst, pattern which represent calcification of the pericyst [3]. During evolution toward healing dense calcification of all component of the cyst may take place. Densely calcified cyst may be assumed to be inactive just like in our case. But a partially/calcified cyst does not always indicate death of the parasite [3, 15]. It is worthy of note that plain radiographic features are nonspecific while Computed tomography has a high sensitivity for hepatic hydatid cyst in both simple or complicated diseases and stages of evolution of the hydatid cyst [13]. Thus we opted to used CT in this case so as to demonstrate the heavily calcified multi concentric intra hepatic mass lesion with daughter components with the core of the mass having HU=37, mainly in the right lobe of the liver with thoracic involvement.

#### IV. Conclusion

We presented the case of a 42 year old patient with a heavily calcified hepatic hydatid cyst which was better diagnosed using imaging modalities.

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