Taenia echinococcus infection of the kidney – CT imaging features of a solitary hydatid cyst in the kidney

Radosław Starownik[1], Krzysztof Bar[1], Robert Klijer[1], Jacek Kiś[1], Kamil Muc[1], Elżbieta Czekajska-Chehab[2], Grzegorz Staśkiewicz[2], Andrzej Drop[2]

[1]Department of Urology and Urological Oncology, Medical University of Lublin, Poland
[2]First Radiology Department, Medical University of Lublin, Poland

KEY WORDS

kidney ◗ *Echinococcus granulosus* ◗ CT imaging

ABSTRACT

Echinococcal infection typically affects the liver and lungs. Other locations are rare and constitute about 5% of cases. A solitary hydatid cyst in a typical location may cause diagnostic difficulties. A case of a solitary hydatid cyst of the left kidney diagnosed in a 26-year-old Chechnyan refugee was presented. Visualization of the mass by computed tomography revealed characteristic features that facilitated a proper diagnosis. The course of the diagnostic and therapeutic processes is presented in the article along with the typical features of a kidney cyst blister demonstrated in computed tomography, allowing for a correct diagnosis.

INTRODUCTION

Hydatid disease is a zoonotic condition caused by a tapeworm larva. The most frequent species that causes the infection is the blister tapeworm (*Echinococcus granulosus*) – a parasite occurring endemically in many regions of the world – the Middle East as well as in Turkey and Greece among others. Migration growth contributed to an increased incidence of this disease in other parts of Europe as well.

The mature form of the blister tapeworm appears in the small intestine of cats and in animals of the dog family, where it attaches to the intestinal wall by means of two wreaths of hooks and four suckers located on its' first segment (scolex); the last mature limb of the adult worm leaves the final host.

A person infected by tapeworm ova becomes the intermediate host (among such animals as sheep, cattle, and pigs). Larvae hatch from ova in the intestine, which are then spread to internal organs and into the blood stream. The most frequently occupied organs are the liver (39-75%) and lungs (27%). They rarely settle in kidneys (about 2-3%), bones (1-4%), brain (1-2%), or spleen (1%). In these organs, larvae grow into hydatid cysts capable of growing in size, even up to a few dozen centimeters. Depending on the location of the parasite in the intermediate host's body, the disease may present a variety of clinical symptoms.

CASE REPORT

The patient, K.S., a 26-year-old male, a citizen of Chechnya (Illness History No. Ch 2343/07), staying in a refugee center in Poland, reported to the admissions room at the Independent Public Clinical Hospital No. 4 in Lublin due to lower back pain on the left side. In the patient's history, there was an injury reported in the area of the left rib arch three months earlier (which was the result of a fall on the board of a lorry).

Laboratory examinations performed revealed leukocytosis (18.64 thousand/ul), moderately increased creatinine concentration in blood serum (1.46 mg/dl), and a normal urine analysis.

Diagnostic ultrasonography of the abdominal cavity revealed the features of slight urinary retention on the left side in the goblet-pelvic system and a lito-liquid area (8.1 x 6.1 cm in size) in the lower pole of the left kidney, which was defined by the radiologist as a hemolyzed hematoma or a tumor with necrotic contents.

The patient was hospitalized in the Clinic of Urology and Urological Oncology. A computed tomography examination of the abdomen revealed the presence of a single multilocular cyst (7.11 x 7.88 cm in size) located in the inferior part of the left kidney.

The patient was qualified for surgical treatment. On the 26th of March, 2007, because of the enormous cyst occupying the major part of the kidney, a nephrectomy was performed on the left side. No complications occurred after the operation and the patient was discharged from the hospital in an overall good condition.

The histopathological result (No. 16142/07) revealed kidney sections in the autolysis state with the presence of a thick-walled cyst surrounded by inflammatory infiltration consisting of *echinococcus granulosus* protoscolexes.

The patient was referred for a check-up and further treatment in the Infectious Diseases Clinic. However, the patient failed to report to the Urology Department for the check-up.

DISCUSSION

The residency of a tapeworm in the kidney constitutes about 3% of all described cases [1]. It is usually a solitary change located in the kidney's cortex. In connection with the location and height of the parasite, the patient may present various clinical symptoms such as: hematuria, pyuria, renal colic, or arterial hypertension. These symptoms may imitate different diseases of the kidney.

The appearance of a parasite in the urine (hydatiduria) exists in the case of a cyst rupturing into the renal pelvic system and is the sole pathognomonic sign, although existing in only 5-28% of infected patients [2]. There is also a group of patients who are left without any symptoms. In this group, changes are detected accidentally and the key to an accurate diagnosis is in a detailed interview followed by laboratory and serologic research as well as carrying out a vivid differential diagnosis [4].

An echinococcal cyst can be recognized solely on the basis of radiological findings. This is important because the hydatid disease can be asymptomatic for many years [7]. Contrast enhanced computed tomography seems to be a particularly useful procedure in the diagnostic process [8, 9]. This diagnosis is probable when CT reveals multi- or unilocular, hypodense and well-defined, frequently

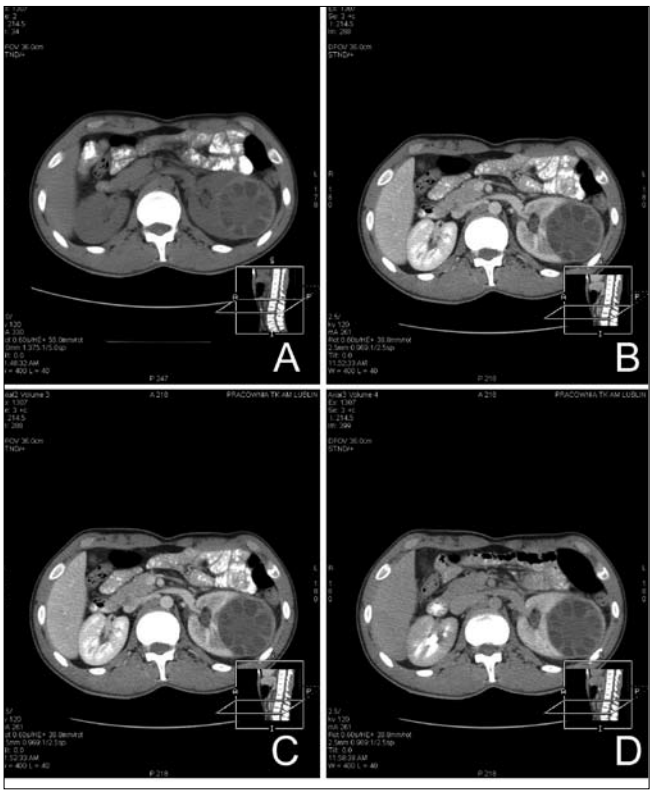

Fig. 1. Axial scans of abdomen, pre-contrast (A) and post-contrast phases (B-D). Hydatid cyst is seen in the lateral part of the left kidney.

solitary, cystic formations [10]. The lesion may contain peripheral cysts called daughter cysts, which are of lesser density than the primary ones [3, 5, 6]. The wall of the echinococcal cyst can be calcified in a ring-like pattern, which usually indicates that the

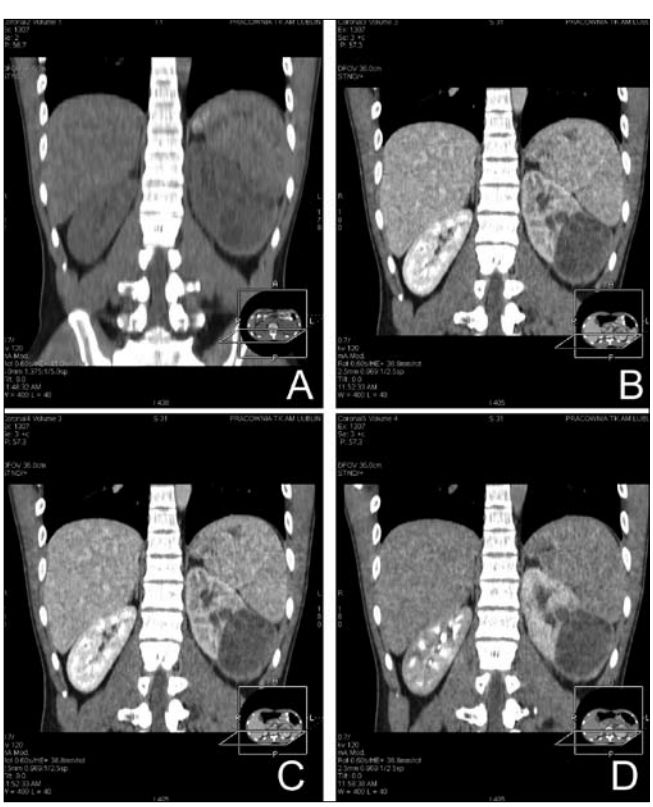

Fig. 2. Coronal reformations of abdomen, pre-contrast (A) and post-contrast phases (B-D). Hydatid cyst is seen in the lateral part of the left kidney.

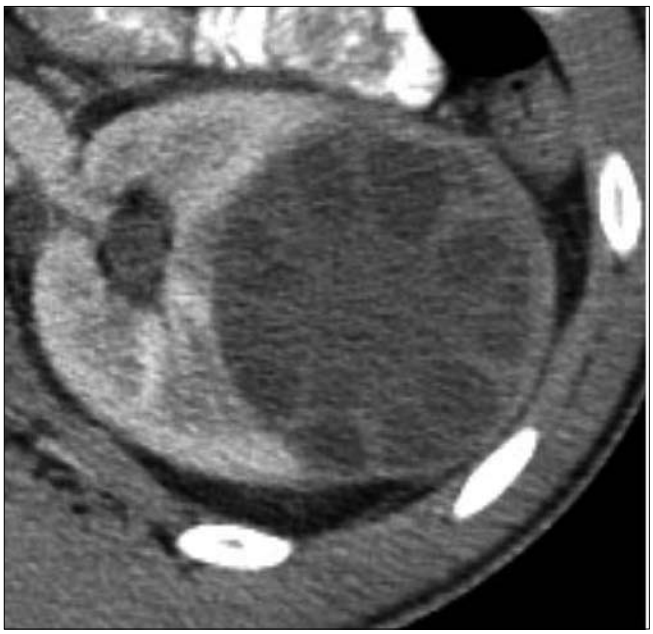

Fig. 3. Enlarged detail of axial scan. Typical "wheel-spoke" appearance of a hydatid cyst.

infection is not active when the ring is complete. After intravenous contrast administration, wall enhancement can be observed unless the calcification, preventing enhancement, is present [9]. The hydatid tumor may result in significant compression of the collecting system resulting in thinning of the renal cortex [5]. Typically, the "wheel-spoke" sign may be observed, which is strongly suggestive of a hydatid cyst, as it results from the presence of daughter cysts separated by the hydatid matrix [11]. Calcifications in the tumor are considered an indication of quiescence or death of the parasite [12].

The case presented in this paper underlines the fact that hydatid disease can be found in atypical localization in non-endemic areas. It is important to consider hydatid disease in the differential diagnosis when imaging features and medical or social history are suggestive in the patient.

Defining the final diagnosis before planned operations is very often difficult, especially in countries where this illness is not endemic. Despite modern vivid techniques, this disease still carries a lot of diagnostic dilemmas and remains a challenge for doctors of many specializations. The sole symptom (hydatiuria) rarely exists and symptoms resulting from kidney cyst enlargement are not characteristic and can be deceiving. The only treatment is surgical resection of the cyst from the occupied organ. Extreme caution must be exercised before releasing of the parasite from the cyst. The completion of surgical treatment should always be accompanied by pharmacological treatment in the form of oral drugs (albendazole or mebendazole).

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Correspondence
Radosław Starownik
Clinic of Urology and Urological Oncology
20-954 Lublin, Poland
8, Jaczewskiego Street
phone: +48 81 724 47 94
starownik@wp.pl