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Isolated Renal Cyst Hydatid: A Rare Case Report

Hydatid cyst is a parasitic disease caused by *Echinococcus granulosus*. It is occurred by orally ingested larvae that invade the mucosa of the small intestine and settle in organs through the blood and lymph circulation. It is still a serious public health problem in endemic areas such as the Mediterranean basin. It is frequently seen in India, Africa, South America, Central European countries and Türkiye. It is most commonly found in the liver (75%) and lungs (15%). Although the incidence of genitourinary involvement is approximately 2-4%, isolated renal involvement is extremely rare with 2%. In this article, we present the computed tomography imaging findings of an incidental case of isolated unilateral hydatid cyst.

Key Words: Hydatid cyst, renal, ultrasonography, computed tomography

İzole Renal Kist Hıdatik: Nadir Olgu Sunumu

Kist hidatik, *Echinococcus granulosus*' un neden olduğu paraziter bir hastalıktır. Ağız yoluyla alınan larvaların ince bağırsak mukozasını istila ederek kan ve lenf dolaşımı yoluyla organlara yerleşmesiyle oluşur. Akdeniz havzası gibi endemik bölgelerde halen ciddi bir halk sağlığı sorunudur. Hindistan, Afrika, Güney Amerika, Orta Avrupa ülkeleri ve Türkiye' de de sıklıkla görülmektedir. En sık karaciğer (%75) ve akciğerlerde (%15) görülür. Genitüriner tutulum insidansı yaklaşık %2-4 olmakla birlikte, izole böbrek tutulumu %2 ile oldukça nadirdir. Bu yazıda izole tek taraflı kist hidatik saptanan insidental bir olgunun Bilgisayarlı Tomografi görüntüleme bulguları sunulmuştur.

Anahtar Kelimeler: Kist hidatik, renal, ultrasonografi, bilgisayarlı tomografi

Introduction

Hydatid cyst is a parasitic disease caused by *Echinococcus granulosus* and rarely *Echinococcus multilocularis*. *Echinococcus granulosus* is one of the most common parasites in Türkiye. It usually occurs in people in close contact with dogs, sheep and cattle. Humans acquire the eggs of the parasite through contact with the last host or by consuming water or food contaminated with the feces of the last host and that humans infected by parasite act as intermediate hosts. These eggs that enter the human intestine divide in the intestinal tract and develop into larvae pass through the intestinal mucosa into the bloodstream (1, 2).

The liver acts as a primary filter and is therefore the most commonly involved organ in hydatid disease (75%), followed by the lungs (15%) which act as a secondary filter. However, hydatid cysts can occur in almost any anatomical site with hematogenous spreading. Although the incidence of genitourinary involvement is approximately 2-4%, isolated renal involvement is extremely rare with 2% (1, 2).

Renal hydatid cysts remain asymptomatic for years and during this time the cysts can become quite large. When patients become symptomatic, they usually have complaint such as lateral mass, pain and dysuria. Large cysts can rupture and cause a strong antigenic immune response leading to urticaria and even anaphylaxis. When cysts rupture into the collecting system, the complaint of flank pain may be accompanied by hematuria and hydatiduria. Hydatiduria is a pathognomonic sign of hydatid cysts of the kidney, but this finding is present in only 10-20% of cases (2-4).

Diagnosis of renal hydatid cysts is difficult due to non-specific clinical findings and routine laboratory tests are not always positive. Radiologic imaging modalities, Ultrasonography (US), Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) are very useful imaging modalities in the diagnosis. In this article, we present the radiologic findings of an incidental case of isolated renal hydatid cyst.

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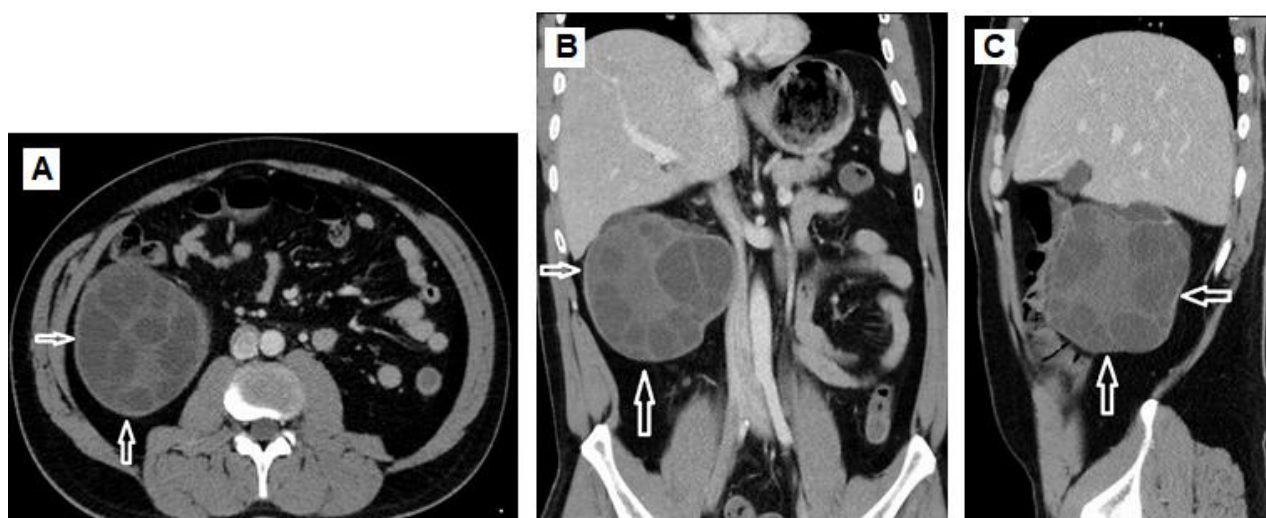


Figure 1. Axial contrast-enhanced upper abdominal CT scan showing a non-contrast enhancing Gharbi Type 3 hydatid cyst in the right kidney, exophytic in the mid-section-lower pole, containing areas consistent with daughter vesicles (A) Appearance of hydatid cyst in coronal (B) and sagittal (C) sections (arrows)

Case Report

A 27-year-old male patient was admitted to the emergency department of our hospital with complaints of acute abdomen. Standing direct abdominal radiograph was unremarkable. Thereon, the patient's complaints abdominal US and then contrast-enhanced abdominal CT were performed. On the examination of abdominal US, a 116x110 mm cystic lesion was observed in the lower pole of the right kidney with exophytic extension, containing homogeneous anechoic areas and smooth contour. Contrast-enhanced CT scan of the abdomen show that the findings compatible with acute appendicitis in the right lower quadrant of the abdomen. In addition, Gharbi Type 3 hydatid cyst was observed with exophytic localization in the mid-section-lower pole of the right kidney, non-contrast and containing areas compatible with daughter vesicles (Figure 1a, b, c). Because of the acute appendicitis, the patient's operation was scheduled. On the other hand, it was decided to plan the treatment of hydatid cyst under elective conditions.

Discussion

Hydatid cysts involve a single organ with a rate of 85-90% (1). Liver is involved in 63%, lung 25%, muscles 5%, bone 3%, kidney 2%, brain 1% and spleen 1%. In adults, the liver and lung are most commonly involved. In children, the lungs are most commonly involved (1).

While renal involvement is usually associated with systemic involvement, isolated renal hydatid cyst disease occurs in very rare cases (1, 2). Kidney is the most commonly involved organ in the genitourinary system. The cyst grows slowly in the kidney, usually lasts for 5-10 years and the mean age at diagnosis of renal hydatid cyst is 30 years. *Echinococcus granulosus* often enters the body during childhood in endemic regions. The cysts grow slowly and usually do not cause

symptoms until they reach a diameter of 5 cm (1). In some cases, cysts may regress spontaneously. Renal cysts may cause rupture, infection, dysfunction due to compression of surrounding tissues and retroperitoneal hemorrhage (1).

Clinical presentation of renal hydatid cysts may vary from asymptomatic to loss of renal function. The most common presentation is non-specific flank pain due to chronic compression of the cyst.

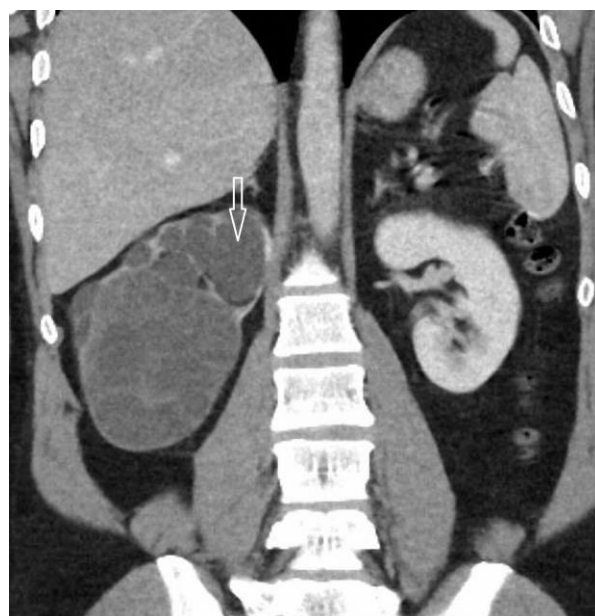


Figure 2. In coronal section, dilation due to hydatid cyst compression is observed in the upper pole calyx of the right kidney (arrow)

In a study conducted in Morocco between 1972 and 2000, they evaluated 90 cases of renal hydatid cysts and found that 84% of the patients had a mass in the flank region, 74% had pain and 24% had hydatiduria (2). Horchani et al. (3) reported lumbal or lumbosacral pain and hydatiduria in 28 % of 47 patients with renal hydatid cysts.

Radiologic imaging methods and serologic tests are used in the diagnosis of hydatid cyst. There are no specific findings to reliably confirm the diagnosis of renal hydatid disease. Serologic tests are not very useful in endemic areas; eosinophilia is seen in only 50% of cases. Serologic tests include Indirect Hem agglutination, Enzyme-Linked Immune Sorbent Assay (ELISA) and Indirect Fluorescent Antibody Tests (4). The sensitivity of these tests is 90% if the cyst is in the liver and 40% the cyst in the lung (4). While positivity of serologic tests confirms the diagnosis, negativity of them does not rule out the disease.

Radiologic studies have a very important role in the preoperative diagnosis of renal hydatid disease (5). US is the primary imaging method for the typing of hydatid cysts (6).

At present, Gharbi's and the WHO classification are very helpful for clinical and imaging correlation, allowing proper characterization of hydatid cysts by the various imaging methods. In 2003, the World Health Organization Informal Working Group on Echinococcosis (WHO-IWGE) proposed a standardized US classification based on the active-transitional-inactive status of the cyst as suggested by its sonographic appearance (7). CE1 and type I (Active): Uniloculated anechoic fluid-filled cysts with double line sign; CE2 and type III (Active): Multiseptated "wheel like", "honeycomb" cysts; C3A and type II (Transitional): The cysts with fluid separated by germinative membranes (water lily sign); C3B and type III (Transitional): The cysts with daughter cyst in solid matrix; CE4 and type IV (Inactive): The cysts with heterogeneous hypoechoic/hyperechoic characteristics, no daughter cysts; CE5 and type V (Inactive): Solid cysts with thick and calcified walls. Detection of daughter vesicles on ultrasound or CT is characteristic of hydatid cysts. Although US is the most important radiologic diagnostic method, CT and MRI are highly sensitive in demonstrating lesions.

CT provides both specificity of the lesions and detailed information about the adjacent urinary tract and extrarenal diseases (8). On non-contrast CT, the hydatid cysts are well circumscribed and contain numerous low-density daughter vesicles arranged at the periphery of the main cyst forming a "wheel-like appearance" with a high-density central matrix. Contrast enhancement of the cyst wall and septa is not seen on contrast-enhanced CT. Hydatid cyst appears on MRI as low signal intensity on T1-weighted images and high signal intensity on T2-weighted images with a hypointense ring which represents the pericyst. Daughter vesicles appear as

hypointense or isointense relative to the matrix on T1- and T2-weighted images. Detached floating membranes appear as a twisted linear structure in the cyst. These cysts containing detached floating membranes also restrict diffusion (8).

The clinical manifestations and laboratory and imaging findings are similar and are particularly difficult to differentiate Type 1 renal hydatid cyst and bosniak Type 1 simple cysts. However, wrong diagnosis may lead to severe clinical outcomes. For example, if Type 1 hydatid cysts are misdiagnosed as simple cysts, surgery will be performed, leading to cyst fluid overflow spread in abdominal cavity or even anaphylactic shock; therefore, a clear diagnosis is very important. It should be kept in mind that complicated hydatid cyst may mimic the lesions such as renal cell carcinoma, renal abscess, renal lymphangioma or angiomyolipoma, etc.

Although multicystic renal cell carcinoma, multicystic nephroma and multicystic complicated cyst are included in differential diagnosis, a wheel-like and honeycomb appearance in the septa is valuable for the diagnosis of complicated hydatid cysts.

Treatment of hydatid cysts may include medical therapy, PAIR (puncture, aspiration, injection, respiration) and surgical operation. In medical treatment, mebendazole and albendazole are used. Medical treatment with albendazole and mebendazole is performed to sterilize the cyst before and after the operation to reduce the possibility of anaphylaxis and to prevent postoperative recurrence. Impairment of liver function is more common as a side effect of the drug. The ideal treatment is period 3-6 months. For cysts smaller than 5 mm, albendazole used alone at a dose of 10-15 mg/kg/day is sufficient, while combined treatments are necessary for cysts larger than 5 mm in diameter. Gharbi's Type 1, 2 and type 3 cysts can be treated with PAIR and catheter technique (9). Although PAIR is a successful treatment method, when cysts are larger than 6 cm, it is necessary to insert a subcutaneous tube several times and drain the cyst contents. The primary treatment of renal hydatid cyst is surgical removal of the cyst. Cystectomy, total or partial nephrectomy are among the surgical options. The most serious complications of surgical treatment are the formation of multiple cysts and fatal anaphylactic shock as a result of rupture of the cyst during surgery operation and the spread of the infestation throughout the body.

As a results, US, CT and MRI are highly successful and helpful radiologic imaging modalities in making the diagnosis of hydatid cysts and guiding the treatment. In societies like in Turkiye where cyst disease is common, hydatid cysts should be considered in the approach to renal localized cysts. In the diagnostic process, it should be kept in mind that a negative serology test does not rule out the diagnosis in the presence of clinical suspicion.

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