Renal hydatid cyst mimicked cystic renal cell carcinoma: A case report

Xiyi Wei1 | Jinyong Tian2 | Jianyu Diao2 | Gulinuer Aibibula2 | Maimaitijiang Dawuti2 | Yiliyasi Tuexun2 | Mhtaer Wubuli2 | Yujie Zhang3 | Ninghong Song1,2 | Jie Yang1,2

1Department of Urology, The First Affiliated Hospital of Nanjing Medical University, Nanjing, China
2Department of Urology, The Affiliated Kezhou People's Hospital of Nanjing Medical University, Kezhou, Xinjiang, China
3Department of Pathology, The Affiliated Kezhou People's Hospital of Nanjing Medical University, Kezhou, Xinjiang, China

Correspondence
Ninghong Song and Jie Yang, Department of Urology, The First Affiliated Hospital of Nanjing Medical University, Nanjing 210029, China.
Email: songninghong@126.com and yj197912@163.com

Funding information
National Natural Science Foundation of China, Grant/Award Numbers: 81871151, 82071638

Abstract
Hydatid cyst (HC) is a zoonotic parasitic disease in agricultural and pastoral areas while renal involvement without liver and lung hydatid is both less common in clinical practice and rarely described in literature. We present a case of a 40-year-old male from Xinjiang who complained of flank pain in the right with oliguria. Robot-assisted laparoscopic exploration, conversion to open laparotomy and excision of internal capsule in right kidney were performed. Finally, a typical renal HC was diagnosed after complementary examinations. Isolated renal HC is very rare and can be misinterpreted as a cystic renal cell carcinoma pre-operatively.

KEYWORDS
cystic renal cell carcinoma, Echinococcus granulosus, renal hydatid cyst, Xinjiang

INTRODUCTION

Hydatid cyst (HC) is a zoonotic parasitic disease mainly caused by the larvae of Echinococcus granulosus. The definitive hosts of the parasite are usually dogs, or some other dog-like carnivores while the intermediate hosts are mostly the livestock such as sheep and cows. Humans acquire the infection when they consume the food or water contaminated with dog feces containing parasite eggs. The disease is endemic in areas with developed animal husbandry all over the world, such as the Mediterranean area, Africa, and Latin America.1

Larvae of the parasite in human bodies are capable to create cysts in all body organs, involving the liver in approximately 70% of cases, the lung in 25%, and other anatomic locations in 5%, such as the kidney,2 the brain,2 the heart and hip joints.3 2%~4% of patients have kidney involvement while isolated kidney involvement (1.9%) is extremely rare.4,5 It usually remains asymptomatic for many years.

The most common presenting signs and symptoms are abdominal mass, flank pain and dysuria.6 Furthermore, they can masquerade as cystic renal tumors both clinically and radiologically.

Here, we present a case of isolated renal hydatid cyst (RHC) in a 40-year-old male which was misinterpreted as cystic renal cell carcinoma in Xinjiang.

1.1 Case presentation

A 40-year-old male presented to Emergency Department with intermittent pain in the right abdomen for 5 years and an increase in severity for 3 days. The patient complained of oliguria recently, however, there was no history of nausea, vomiting, diarrhea, constipation or fever. Similarly, there was no history of hematuria and significant surgical and medical history. His physical examination revealed...
tenderness in the right abdomen and percussion tenderness over the right kidney region.

Concerning the symptoms and the involved organs, the analysis of blood biochemical parameters was prescribed for the patient. The results revealed increased WBC (19.01 \times 10^9/L, normal range 4.0–10.0 \times 10^9/L), PCT (0.530 ng/ml, normal range <0.1 ng/ml) and CRP (48.40 mg/L, normal range <8 mg/L), while the percentage of eosinophils revealed 0% (normal range 0.5%-5%). Contrast-enhanced computerized tomography (CT) of the whole abdomen demonstrated an 8.5 \times 9.5 \times 11.3-cm cystic lesion of the middle and lower pole of the right kidney with multiple separates, a small amount of solid parts, partially contrast enhancement and without secondary locations, considering (multilocular cystic) renal carcinoma or other cystic renal mass (Figure 1). Ultrasound of the abdomen showed an intraperitoneal cystic mass in the right middle abdomen, considering HC. The results of ultrasound and CT did not point to a definite diagnosis.

Based on radiological findings, we made a preliminary diagnosis of cystic renal cell carcinoma and planned exploration and cystectomy. After receiving symptomatic supportive treatments such as anti-inflammatory and fluid rehydration, exploration was performed with the robotic assistance using the extraperitoneal approach. During the operation, it was found that the mass adhered to the lower edge of the liver and it was difficult to dissociate, so we decided to convert to open laparotomy. On exploration, a large cystic structure was found to arise from right kidney. To prevent intraoperative dissemination, hypertonic saline gauze was placed on the surrounding organs. Then, the cyst was opened, and daughter vesicles and membrane were removed (Figure 2). Hydrogen peroxide and hypertonic sodium chloride were successively injected into the residual cavity as fungicides. After partial resection of the capsule wall, the kidney was sutured and drainage was indwelled.

There were no intraoperative or postoperative complications. Histopathological examination revealed HC (Figure 3). The patient was on postoperative oral albendazole 10 mg/kg per day treatment for 1 year with regular follow-up, which has been uneventful. 1-month follow-up CT examination did not reveal any new or residual hydatidosis.

2 | DISCUSSION

HC is a common epidemic parasitic disease in pastoral areas around the world, which mostly occurs in people who have close contact with cattle, sheep, dogs, and other livestock. The overall disease burden of HC is significant, equivalent to the annual loss of more than 1 million disability-adjusted life years (DALYs). HC is caused by the invasion of fine-grained echinococcosis into the kidney, which often originates from the renal cortex and grows distensively. Those without complications tend to have no conscious symptoms. With the enlargement of cyst and oppression of
surrounding organs or tissues, soreness of waist and lumbago may occur in the late stage. Occasionally, cysts invade the renal calyces, and the white powdery cyst wall and daughter cysts are discharged with the urine, which can lead to renal colic or urine changes such as hematuria and pyuria.

The diagnosis of RHC should be combined with medical history, clinical manifestations and ultrasound, CT, and serological examinations. Ultrasound is the first choice among the auxiliary inspections. The typical sonographic appearance is anechoic lesions with well-defined margins. The “falling snowflakes” sign is characterized by multiple echogenic foci of hydatid sand, which is considered a pathognomonic finding for HC. CT is more accurate than ultrasound, and the characteristic findings for RHC include a cyst with a thick or calcified wall, a unilocular cyst with a detached membrane, and a unilocular cyst with a detached membrane. Laboratory tests include blood routine, intradermal allergic test (Casoni test) and indirect hemagglutination test and enzyme-linked immunosorbent assay, etc. Serologic and hemagglutination tests have low reliability but a positive test result is indicative of active disease.

RHC is difficult to differentiate by ultrasound and CT from simple renal cysts and cystic renal tumors in the early stage. The reasons for the initial misdiagnosis of this patient as a renal cystic tumor were as follows: (1) Since the incidence of RHC was low, the attending physician was not aware of it and took the history carelessly. (2) The
The patient had a history of living in a pastoral area in Xinjiang for many years, but the place of long-term residence did not belong to the above-mentioned high incidence area, so the diagnosis was easily missed; (3) In our case, the CT showed a cyst Bosniak IV according to the modified Bosniak Classification of Cystic Renal Masses,\(^\text{13}\) which was difficult to differentiate from cystic renal cell carcinoma. Many cases of isolated RHCs being misdiagnosed have been reported and operated as renal tumors in the literature.\(^\text{14–16}\) The challenge is to avoid the spillage of the content of the cyst.

Treatment of RHC aims to relieve the destruction of kidney tissues by the worm and to inhibit allergic reactions and implantation of the worm. Currently, treatment with surgery is given priority to, and the principle is to remove the inner capsule of echinococcosis, prevent the fluid from overflowing, eliminate the residual cavity of the outer capsule and prevent postoperative recurrence. Drug therapy is mainly used to prevent dissemination before operation, recurrence after operation and diffuse multilocular echinococcosis which is not suitable for surgical removal. Albendazole and mebendazole are commonly used.

2.1 | Patient perspective

The patient was satisfied with the treatment effect.

AUTHOR CONTRIBUTIONS

Xiyi Wei wrote the manuscript. Jinyong Tian, Jianyu Diao, Gulinuer Aibibula, Maimaitijiang Dawuti, Yiliyasi Tuexun, and Mhtaer Wubuli completed the surgery on the patient and compiled the case data. Yujie Zhang performed the pathological diagnosis on the surgical specimen. Ninghong Song and Jie Yang organised and led the work.

ACKNOWLEDGMENTS

This work was supported by the National Natural Science Foundation of China (grant numbers 81871151 and 82071638).

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

ETHICAL STATEMENT

The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013).

ORCID

Xiyi Wei https://orcid.org/0000-0002-0166-3194

REFERENCES

1. Zmerli S, Ayed M, Horchani A, et al. Hydatid cyst of the kidney: diagnosis and treatment. World J Surg. 2001;25:68-74. doi:10.1007/s002680200009
2. Polat P, Kantarci M, Alper F, et al. Hydatid disease from head to toe. Radiographics. 2003;23:475-494; quiz 536-477. doi:10.1148/rg.232025704
3. Gurzu S, Belea MA, Egyed-Zsigmond E, Jung I. Unusual location of hydatid cysts: report of two cases in the heart and hip joint of Romanian patients. Korean J Parasitol. 2017;55:429-431. doi:10.3347/kjp.2017.55.4.429
4. Demir M, Yagıç M. Isolated renal hydatid cyst in a 6-year-old boy: a case report. Iran J Parasitol. 2021;16:692-696. doi:10.18502/ijpa.v16i4.7883
5. Cankorkmaz L, Korgali E, Atalar MH, Köylüoğlu G. Case report: isolated renal hydatid cyst in a boy. Turkiye Parazitoloji Dergisi. 2019;43:89-91. doi:10.4274/tpd.galenos.2019.6033
6. Odev K, Kilinc M, Arslan A, et al. Renal hydatid cysts and the evaluation of their radiologic images. Eur Urol. 1996;30:40-49. doi:10.1159/000474143
7. Yousofi Darani H, Jafari R. Renal echinococcosis: the parasite, host immune response, diagnosis and management. J Infect Dev Ctries. 2020;14:420-427. doi:10.3855/jidc.11496
8. Shahait M, Saoud R, El Hajj A. Laparoscopic treatment of giant renal cystic echinococcosis. Int J Infect Dis. 2016;42:58-60. doi:10.1016/j.ijid.2015.11.016
9. Ramteke VV, Deshpande NS, Balwani MR, Bawankule CP. Primary renal echinococcosis. Indian J Nephrol. 2017;27:316-318. doi:10.4103/0971-4065.202839
10. Anil Kumar S, Shetty A, Vijaya C, Geethamani V. Isolated primary renal echinococcosis: a rare entity. Int Urol Nephrol. 2013;45:613-616. doi:10.1007/s11255-013-0402-6
11. Turgut AT, Odev K, Kabaalioglu A, Bhatt S, Dogra VS. Multitechnique evaluation of renal hydatid disease. AJR Am J Roentgenol. 2009;192:462-467. doi:10.2214/ajr.08.1129
12. Henry JD, Utz DC, Hahn RG, Thompson JH Jr, Stilwell GG. Echinococcal disease of the kidney: report of case. J Urol. 1966;96:431-435. doi:10.1016/s0022-5347(17)63283-x
13. Silverman SG, Pedrosa I, Ellis JH, et al. Bosniak classification of cystic renal masses, version 2019: an update proposal and needs assessment. Radiology. 2019;292:475-488. doi:10.1148/radol.2019182646
14. Gadelkareem RA, Elqady AA, Abd-Elshefy SK, Imam H, Abolella HA. Isolated renal hydatid cyst misdiagnosed and operated as a cystic renal tumor. Med Princ Pract. 2018;27:297-300. doi:10.1159/000488878
15. Choi H, Park JY, Kim JH, Moon DG, Lee JG, Bae JH. Primary renal hydatid cyst: mis-interpretation as a renal malignancy. Korean J Parasitol. 2014;52:295-298. doi:10.3347/kjp.2014.52.3.295
16. Mohamed, I., Tarik M., Mohammed A., Alaouli W., Abdelghani O., Ali B. Primary hydatid cyst looked like renal cell carcinoma: case report. J Surg Case Rep 2020, 2020, rja231, doi:10.1093/jscr/rja231 (2020).

How to cite this article: Wei X, Tian J, Diao J, et al. Renal hydatid cyst mimicked cystic renal cell carcinoma: A case report. Precision Medical Sciences. 2022;11(1):35-38. doi:10.1002/prm2.12062