

CASE REPORT

A rare case of concurrent pulmonary and hepatic hydatid cysts treated by single-stage surgical management

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Funding information

No financial support was received for the study

Abstract

A 37-year-old woman was diagnosed with concurrent pulmonary and hepatic hydatid cysts. We performed simultaneous resection of hydatid cysts in the liver and right lung using a single-stage surgical procedure. The patient completely recovered.

KEYWORDS

concurrent, hepatic hydatid cysts, hydatid disease, pulmonary hydatid cysts, single-stage surgical management, surgical resection

1 | INTRODUCTION

Hydatid disease is a parasitic infestation caused by *Echinococcus granulosus* and is most commonly observed in the liver (60%–70%),^{1,2} followed by the lungs (5%–44%).^{3,4} Humans can become infected with *Echinococcus* through close contact with affected animals. Hydatid disease remains an urgent problem requiring surgery, especially in areas with endemic *Echinococcus*.^{5,6} Concurrent pulmonary and hepatic hydatid cysts are reported in 4.6%–12.4% of cases requiring surgical treatment,⁷ and the priority of surgical treatment in cases with concurrent cysts is not well established. Some surgeons recommend performing sequential operations, starting with the lung

or liver, whereas others recommend initial surgery for the organ with the greater risk of complications. Currently, minimally invasive interventions are performed for most patients with hydatid disease.^{8,9} Despite the advent of endovideosurgical technologies, the treatment priority for concurrent hydatid disease is still unclear. Moreover, there are few reports of single-stage surgical management in cases of concurrent pulmonary and hepatic hydatid cysts.

Herein, we present the case of a 37-year-old woman from a rural area of Kyrgyzstan, who was diagnosed with concurrent pulmonary and hepatic hydatid cysts. The patient was treated with single-stage surgery and achieved a complete postoperative recovery.

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2 | CASE PRESENTATION

A 37-year-old woman presented to our hospital with a 1-month history of a burning sensation in the right upper quadrant of the abdomen. During admission, the patient demonstrated a productive cough with yellow sputum, abdominal tenderness on the right upper quadrant, and minimally audible vesicular breath sounds in the right lower lobe of the lung without wheezing. Her arterial blood pressure was 120/80 mmHg, pulse was 81 beats per minute, and oxygen saturation was 97%. The abdomen was soft with no tenderness, and the liver protruded by 2 cm below the costal arch. There was no family or personal history of tuberculosis or other pulmonary diseases.

Her laboratory test findings showed a normal leukocyte count (7.7×10^9 cells/L), elevated erythrocytes (4.6×10^{12} /L), erythrocyte sedimentation rate (99 mm/h), C-reactive protein level (150 mg/L), and total bilirubin level (14 U/L), and decreased hemoglobin (2.96 mmol/L). Abdominal ultrasound and computed tomography (CT) of the chest revealed volumetric lesions of 87.3×72.1 mm in the 10th segment of the right lower lobe of the lung and 37.4×29.6 mm in the fourth (medial) segment of the liver. Following these investigations, the patient was diagnosed with hydatid cysts in the right lobe of the lung and the liver (Figure 1).

According to the patient's condition, and the size and location of the cysts, the initial treatment plan was to remove the cyst from the liver and subsequently remove the cyst from the right lung. Pre-emptive antibiotic therapy with 1 g IV ceftriaxone was commenced 1 day prior to the surgery.

Endotracheal anesthesia was performed, and a double-lumen tube was used for one-lung ventilation. Laparoscopic treatment of the hepatic hydatid cyst was initially performed. The parasitic cyst in the superior (IVa) segment of the liver was observed to have a whitish wall. An additional access incision (0.5 cm) was performed in the subcostal area, a content trocar was used to aspirate the cyst, and a 15% hypertonic solution was used to fill the cyst cavity after 10 min of respiration. A secondary suction device was used to prevent spillover contamination of the abdominal cavity in case of fluid escape from the trocar. In

total, 300–400 ml of fluid with fragments of the chitinous membrane was evacuated from the hydatid cyst and the exterior wall of the cyst was removed. After removing the morcellator, an external drainage tube was installed along the trocar for drainage of the subhepatic space.

Following the removal of the hepatic cyst, the patient was positioned on their left side, to allow access to the right side of the body. A three-port thoracoscopy was conducted on the right side. Upon examination of the pleural cavity, the cyst was found to occupy the basal segments of the lower lobe of the right lung and protrude along the diaphragmatic surface. The contents of the cyst were evacuated with an aspiration vacuum needle, and the cyst was treated with a 15% hypertonic solution for 15–20 min. Subsequently, the chitinous membrane was removed. Precise excision of the fibrous capsule was performed using a harmonic scalpel. The resulting wound surface was sutured with simple interrupted sutures with lower lobe reconstruction to maintain aero- and hemostasis. At the end of the operation, aeration of the right lung was renewed, and lung straightening was performed. The pleural cavity was drained using a silicone tube connected to a portable drainage system.

During the postoperative period, albendazole anti-relapse chemotherapy (10 mg/kg, 400 mg, twice daily) was administered for 6 weeks. Physiotherapy and breathing exercises were performed from the day after the operation. The drain from the pleural cavity was removed on the 4th postoperative day and the drainage for the hepatic hydatid cyst remained in place until day 14 postoperative to control drainage from the residual cyst cavity. The patient was discharged from the hospital on day 20 postoperatively in a satisfactory condition.

3 | DISCUSSION

Several surgical methods are recommended for the treatment of hydatid cysts, ranging from aspiration to segmental and radical resection. The advantages of laparoscopy include minimal trauma to the operating field, reduced pain, accelerated postoperative return of bowel function, early ambulation, and rapid wound healing.¹⁰

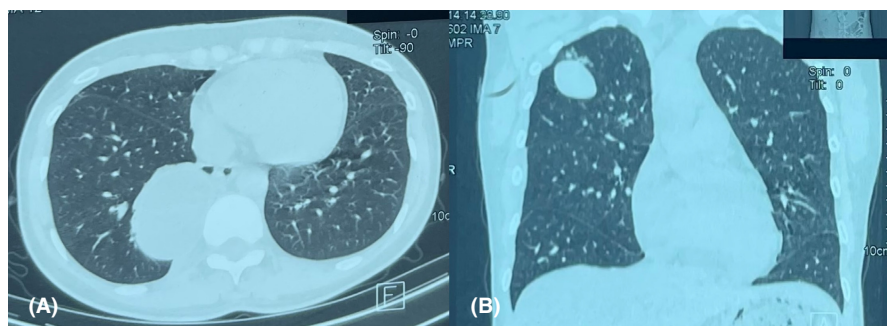


FIGURE 1 CT image of the right lung and right lobe of the liver

Additionally, laparoscopy allows for a full examination of the abdominal cavity and inner surface of the cyst.

The success of laparoscopic surgery is limited by the complex accessible features of hydatid cysts, abdominal adhesions, and anaphylactic shock in cases of hydatid cyst rupture.¹¹ Finally, with large, multiple, and complicated pulmonary hydatid cysts, performing surgical approaches, such as thoracotomy and sternotomy may lead to major surgical trauma and long-term disability.¹²

Surgical removal of hydatid cysts by thoracoscopy minimizes the risks of open surgery. However, the benefits of thoracoscopy are limited due to the high risk of surgical complications, such as intrabronchial cyst rupture and difficulties indicating bronchopleural fistulas opening into the cyst cavity.⁸

A thoracoscopic approach for treating pulmonary hydatid cysts shows more positive results compared to thoracotomy, indicated by a shortened surgical duration, decreased need for analgesics, lower incidence of postoperative infection, and shortened postoperative stay.¹³ Nevertheless, literature has shown that thoracoscopic interventions are associated with a risk of conversion to thoracotomy and a high incidence of postoperative complications of anesthesia. In addition, thoracotomy is still considered the optimal method of surgical resection for cysts larger than 5 cm.¹⁴ In general, the advantageous aspects of laparoscopy and thoracoscopy are the main factors that determine the sequence of surgery for concurrent pulmonary and hepatic hydatid cysts and the possibility of simultaneous operations. Postoperative medical treatment also reduces the recurrence rates considerably.¹⁵ The treatment for the case reported here followed a standard protocol which not only decreased undue stress for the patient, but also proved to be cost-effective with decreased postoperative complications and recurrence.

Endoscopic minimally invasive (intracavitary) technologies can be successfully used to treat concurrent pulmonary and hepatic hydatid cysts. This report deserves attention due to the nature of the disease and the success of the single-stage surgical management of cysts in the liver and right lung simultaneously with a favorable postoperative course.

In conclusion, single-stage surgical management of concurrent hydatid cysts minimizes surgical trauma and is a cost-effective approach associated with decreased morbidity and length of postoperative hospital stay.

AUTHOR CONTRIBUTIONS

Bakyt Toktogaziev and Kanat Omorov contributed to conception, design of the work, clinical management, manuscript preparation, and data acquisition. Siezbek Aitbaev, Bakyt Artisbekov, and Rahat Omorov contributed to conception, manuscript preparation, and data acquisition.

Yethindra Vityala and Tugolbai Tagaev contributed to design of the work, manuscript preparation, and data acquisition.

ACKNOWLEDGEMENT

None.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data are available from the corresponding author upon reasonable request.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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How to cite this article: Toktogaziev B, Omorov K, Aitbaev S, et al. A rare case of concurrent pulmonary and hepatic hydatid cysts treated by single-stage surgical management. *Clin Case Rep.* 2022;10:e05897. doi:[10.1002/ccr3.5897](https://doi.org/10.1002/ccr3.5897)