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Bile leakage test in emergency hydatid liver cyst surgery

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ABSTRACT

INTRODUCTION AND IMPORTANCE: In liver cyst hydatid surgery, presence of cysto-biliary communication (CBC) is important for the prevention of postoperative morbidity. If cysto-biliary connections are not obvious, diagnosis is not easy. Intraoperative bile leakage test has been shown to reduce postoperative biliary complications by revealing occult CBCs. However, bile leakage testing in emergency conditions such as hydatid cyst perforation has not been experienced so far.

CASE PRESENTATION: Here, a bile leakage test performed in a 23-year-old male patient undergoing emergency surgery due to the perforation of the hydatid liver cyst was presented. Following the treatment of perforated hydatid liver cyst and biliary peritonitis, a bile leakage test was performed. The common bile duct was cannulated with a 22G catheter, normal saline and parenteral lipid solution were given to demonstrate the CBCs, and leakage areas were suture ligated. The patient was discharged postoperatively without any problem.

CONCLUSION: We recommend detection and treatment of the CBCs even in emergency hydatid liver cyst surgery for prevention of postoperative biliary complications.

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1. Introduction

Cyst hydatid is mostly located in the liver and surgical methods are often used in treatment. Biliary fistula is an important cause of morbidity after the hydatid cyst operation. It is not always possible to understand whether the hydatid cyst has a cysto-biliary communication (CBC) before surgery unless the presence of obvious CBC that caused jaundice and cholangitis [1,2].

It is not always possible to reveal the existing occult CBC during the operation. Various methods have been described to demonstrate CBC in surgery. Among these, bile leakage test via a T-tube and waiting by placement of sponges into the cyst cavitation [3–5]. For the elective surgery of liver hydatid cysts, we have been using bile leakage test as a standard method to demonstrate CBCs for a long time [6]. Here, bile leakage test was presented in a patient who was operated for hydatid liver cyst perforation for the first time.

This work has been reported in line with the SCARE 2020 criteria [7].

2. Case presentation

A 23-year-old male was referred to our hospital in an emergency setting, when hydatid liver cyst perforation was detected in

another center. There was no history of medication in the patient's medical history and no family history of genetic or psychosocial diseases. There was a generalized tenderness, defense, and rebound on abdominal examination. Emergency abdominal ultrasonography revealed perforated 14 × 10 cm hydatid cyst in liver segment 5–7 and 9 × 5 cm cyst in segment 2–3 and generalized free fluid in the abdomen. Computed abdominal tomography confirmed the perforated hydatid liver cysts (Fig. 1). His laboratory test were as shown: white blood cell (WBC): 11,600 mm³, hemoglobin (Hgb): 13.2 g/dL, sodium (Na): 130 mmol/L, potassium (K): 3.8 mmol/L, C-reactive protein (CRP): 16.7 mg/dl, total bilirubin: 1.06 mg/dL, direct bilirubin: 0.46 mg/dL, aspartate amino transferase (AST): 25 U/L, alanine amino transferase (ALT): 19 U/L, alkaline phosphatase (ALP): 80 U/L, and amylase: 52 U/L. In emergency laparotomy by an assistant of gastroenterology surgery, a perforated cyst hydatid and bile content were found extending from the left lobe of the liver to the omentum majus. In addition, a second hydatid cyst filling the right lobe was observed (Fig. 2). The abdominal cavity was cleaned, the cyst contents were evacuated, unroofing was performed for both cysts and bile leakage test was performed through the common bile duct. The bile duct was cannulated by a 22G catheter, an extension intravenous fluid line was attached to this catheter and the distal common bile duct was closed with a Pringle maneuver (Fig. 3). Normal saline and parenteral lipid solution were given consecutively through this catheter, visible CBCs in the cyst cavities were sutured with 3/0 polypropylene sutures. Lastly the test was repeated with methylene blue dye. After removing the 22G catheter from the common bile duct, we repaired the catheter puncture site with a 6/0

Abbreviation: CBC, cysto-biliary connection.

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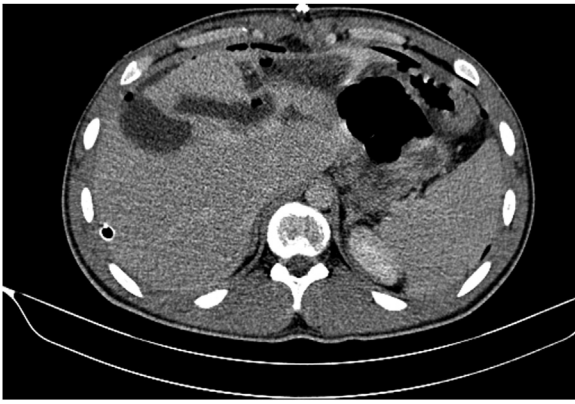


Fig. 1. The perforated hydatid liver cysts in computed abdominal tomography.

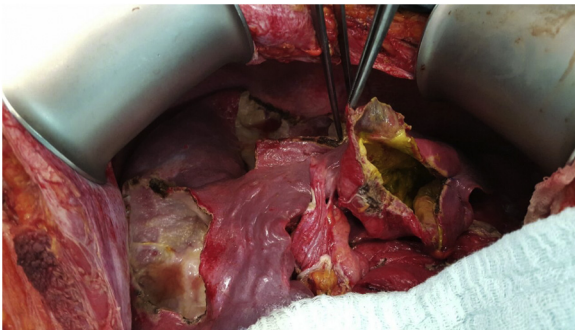


Fig. 2. Perforated cyst hydatid from the left lobe of the liver.

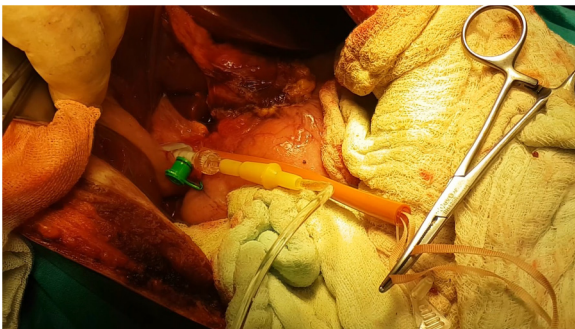


Fig. 3. The common bile duct was cannulated by a 22G catheter for bile leakage test.

polypropylene suture and a drain was placed into the cyst cavity. He did not have biliary drainage in the postoperative period, and he was discharged on the 11th day uneventfully. The patient continued to be followed up in our hospital for a recurrence of hydatid cyst every 3 months after discharge. In the follow-up of the patient, no recurrence of hydatid cyst was detected.

3. Discussion

In liver hydatid cyst patients, CBC is seen in 2–42% in different series [8]. A CBC can occur anywhere in the bile duct tree, but cysts close to the hilar region have a higher incidence [9]. If the CBCs are ≥ 5 mm, they can cause obvious rupture into the bile duct, but CBC cannot be noticed when < 5 mm (3). CBC is obvious in 3–17% of liver hydatid cyst cases and it can be as occult in 10–37% [10].

In a systematic review examining the factors on intraperitoneal perforation of the hydatid cyst cases revealed that the perforation was most common in the liver hydatid cysts [11]. It was emphasized

that the size of the hydatid cyst was an important factor and most of the perforated cases were more than 10 cm.

The clinical symptoms of obvious CBC are obstructive jaundice, abdominal pain, fever, nausea, and vomiting. It may also cause cholangitis and sepsis [12]. Overlooked CBCs are generally asymptomatic and they can usually be understood with postoperative bile leakage or fistula. It should be kept in mind that there may be small occult CBCs if bilirubin or alkaline phosphatase level is high or a cyst diameter > 10.5 cm [10].

Although the biliary leakage caused by CBCs is self-limited, this process is not always benign. It has potential hazards in terms of postoperative cavity related complications such as long-term postoperative biliary drainage and cavity abscess [13]. Due to these complications, postoperative endoscopic retrograde cholangiopancreatography, percutaneous abscess drainage, and even surgical intervention may be required [4,14].

Basic principles in surgical treatment of liver hydatid cyst includes; complete removal of parasites, prevention of spillage and protection of healthy liver tissue. However, CBCs should also be detected and treated by disconnection for prevention of postoperative long-lasting biliary complications. Many methods have been described for this purpose, but each method has pros and cons. Injecting dyes from the cystic duct may not work. If the cystic duct opens into the duct below, it is not possible to view the biliary tree by intraoperative cholangiography through the cystic duct. Intraoperative cholangiography from the common bile duct via T-tube is a method that increases morbidity of choledochotomy. Preoperative endoscopic retrograde cholangiopancreatography is a method with its own morbidity and is generally used for postoperative diagnosis and treatment.

We have been using common bile duct cannulation for bile leakage test method, as a standard for routine elective surgery of all liver hydatid cyst cases [6]. After cannulation of the common bile duct, we first give normal saline or parenteral lipid solution for testing. Then we suture the CBCs and we repeat the test with methylene blue. We prefer the methylene blue lastly, because it dyes the entire cyst and can avoid the visibility of other potential CBCs.

Although very rare; there can be some complications of cannulation: leakages from the common bile duct puncture site, injury of posterior wall of common bile duct, and choledochal-portal fistula can occur. If the portal vein is punctured accidentally, it almost always limits itself by simple compression and waiting for a while.

An autonom CBC (not connected to the common bile duct) cannot be detected by our bile leakage test, because of the divided biliary tract into two as proximal and distal CBCs. During the test, the distal CBC is noticed and closed, but the proximal section can only be seen by the positive outflow of bile through of the liver. Autonom CBC is a very rare clinic condition in hydatid liver cyst surgery and it is generally noticed in the postoperative period and can be seen by magnetic resonance cholangiopancreatography or cystography performed through a drain.

4. Conclusion

In our bile leakage test, it facilitates the detection of CBCs using the common bile duct. In addition, we think that this test can be applied even in emergency conditions.

Declaration of Competing Interest

None.

Funding

None.

Ethical approval

No need for ethical approval, This work is exempt.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Ufuk Uylas, MD (Corresponding author)
 Conceptualization, Data curation, Resources, Software, Validation, Writing - original draft, Writing - review & editing.
 Ali Tardu, Associate Professor
 Conceptualization, Formal analysis, Investigation, Validation, Visualization.
 Cuneyt Kayaalp, Professor
 Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing.

Registration of research studies

Not applicable.

Guarantor

Uylas accept full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

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