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Drainage of the Hepatic Cyst by Laparoscopy: Clinical Case

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Abstract

Introduction: Liver cysts are formations of serous content surrounded by normal liver parenchyma, without communication with the bile duct. The cyst wall is generally lined with cuboidal epithelium surrounded by layers of connective tissue. They are rare entities in adult patients, generally, they are asymptomatic in 3%, and between 10-15% of all patients will generate symptoms that lead them to consult.

Clinical case: A 38-year-old man with an external abdominal tomography study that reported a giant hepatic cyst. Laboratory blood tests: hemoglobin 7.9 g/dL; leukocytosis 11,000/uL; serum electrolytes, liver transaminases, and bilirubin were normal, Alkaline Phosphatase, and Gamma Glutamyl-Transpeptidase 94 U/L and 241 U/L, respectively. Non-reactive anti-HIV 1 and anti-HIV 2 antibodies, VDRL, CA 19-9 antigen, hepatitis B-C surface antigen, and carcinoembryonic antigen were negative. He underwent surgery by laparoscopic drainage of the liver cyst, through a median infraumbilical incision with the Hasson technique and placement of three 12 mm trocars, hepatomegaly was observed without finding an exit site for purulent material, it was punctured through liver segment V, and 2000 ml of citrine fluid was extracted. The hepatic wound is addressed with a 1-0 caliber chromic catgut thread, placing a Penrose-type drain. At 48 hours postoperatively, it evolves favorably, so it is decided to hospital discharge.

Discussion: Hepatic cysts are fluid-filled cavities lined by a single-layered cuboidal or columnar biliary epithelium in the liver. A majority of hepatic cysts are found incidentally on liver imaging, such as abdominal ultrasonography, computed tomography, or magnetic resonance imaging.

Keywords: Liver; Simple hepatic cyst; Aspiration; Laparoscopic technique

Introduction

T Liver cysts are formations of serous content surrounded by normal liver parenchyma, without communication with the bile duct. The cyst wall is generally lined with cuboidal epithelium surrounded by layers of connective tissue [1]. They are rare entities in adult patients, generally, they are asymptomatic in 3%, and between 10-15% of all patients will generate symptoms that lead them to consult [2]. Diagnosis is achieved mainly through intraoperative findings due to their complications and the rest incidentally during imaging approaches [3]. Simple cyst complications occur in 5% of patients. The two most frequent are infection, usually monomicrobial by E. coli, and hemorrhage [4]. It is a rare pathology with heterogeneous therapy, depending on some factors such as the number, location, and relationship with other structures and the content of the cysts: aspiration by percutaneous puncture guided by ultrasound or by laparoscopy with or without injection of sclerosing substances, coagulation

with argon plasma in the wall of the cyst cavity, unroofing and communication with the peritoneal cavity, cystojejunostomy, complete excision of the cyst, partial hepatectomy, hepatic lobectomy and even liver transplantation [5].

Clinical Case

A 38-year-old man attended the general surgery outpatient clinic with an external abdominal tomography study that reported a giant hepatic cyst. He has a history of pulmonary tuberculosis of two years of evolution under treatment and denies another chronic-degenerative history, allergies, and previous surgeries denied. He reports a fever of 4 months of evolution, the presence of low back pain, generalized joint pain, vomiting, early anxiety, headache, asthenia, adynamia, and a weight loss of 20 kg a month ago. He was admitted to the general surgery floor and laboratory blood tests were taken, reporting anemia of 7.9 g/dL; mild leukocytosis of 11,000/uL at the expense of neutrophils; serum electrolytes, liver transaminases, and bilirubin were normal, Alkaline Phosphatase and Gamma Glutamyl-Transpeptidase slightly elevated 294 U/L and 241 U/L, respectively. Non-reactive anti-HIV 1 and anti-HIV 2 antibodies, VDRL, CA 19-9 antigen, hepatitis B-C surface antigen, and carcinoembryonic antigen were negative.

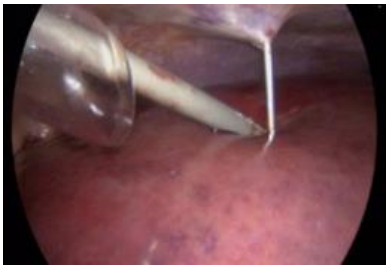

Figure 1: *Trocar in situ on hepatic cyst.*

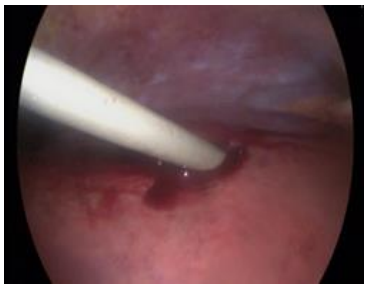

Figure 2: *Evacuation of sallow fluid from the liver cyst.*

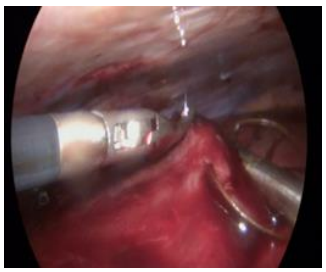

Figure 3: *Hepatic cyst puncture site closure.*

Empirical intravenous antibiotic therapy with a full dose of imipenem was started. He was evaluated by the internal medicine service estimated surgical risk in Goldman II and later underwent surgery by laparoscopic drainage of the liver cyst (04.25.22), through a median infraumbilical incision with the Hasson technique and placement of three 12mm trocars, hepatomegaly was observed without finding an exit site for purulent material, it was punctured through liver segment V (Figure 1) and 2000 ml of citrine fluid was extracted (Figure 2), a sample was taken for cytochemical, cytological, and culture study. The cavity is washed and the hepatic wound is addressed with a 1-0 caliber chromic catgut thread (Figure 3), placing a Penrose-type drain directed to the right parieto-colic slider and exteriorized on the ipsilateral flank. Trans-surgical bleeding was quantified in 1500 ml. After the surgical procedure, he was readmitted to the general surgery floor where he was transfused with a packed erythrocyte with control hemoglobin of 8.8 g/dL at 24 hours. At 48 hours postoperatively, it evolves favorably, so it is decided to hospital discharge. Cytochemical control laboratories reported glucose of 73 mg/dL, LDH 789 U/L, total protein 5.8 g/dL; albumin of 2.3 g/dL, and negative fluid culture at 7 days.

Discussion

Liver cysts are fluid-filled cavities lined by single-layered columnar or cuboidal biliary epithelium in the liver. Most liver cysts are found incidentally on imaging of the liver, such as abdominal ultrasound (US), computed tomography (CT), or magnetic resonance imaging (MRI). Hepatic cystic lesions are heterogeneous clusters; most are simple liver cysts, but some may be malignancies, such as cystadenocarcinoma. Simple liver cysts are thought to be congenital aberrations of biliary development. During embryogenesis, aberrant intrahepatic bile ducts develop and dilate to form liver cysts. Liver cysts are usually asymptomatic and do not require special treatment. However, complications such as infections or ruptures can cause fever or abdominal pain. In addition, large liver cysts occasionally cause unpleasant symptoms, such as abdominal distension, jaundice, portal hypertension, and leg edema due to compression of surrounding organs or hepatic vasculature. The prevalence of simple liver cysts is increasingly common with age [6].

Liver lesions are common findings in the daily routine of radiologists. They are a complex category of pathologies ranging from solitary benign lesions to primary liver tumors and liver metastases. Benign focal liver lesions can arise from different types of liver cells: epithelial (hepatocytes and bile cells) and non-epithelial (mesenchymal cells). Diagnosis is often straightforward, although sometimes distinguishing between primary and secondary malignancies can present a diagnostic challenge due to the atypical appearance and characteristics of the tumor. To avoid misdiagnosis, radiologists must address the key

characteristics of the lesion and decide which imaging procedure [for example, ultrasound, computed tomography, and/or magnetic resonance imaging (MRI)] will most likely provide the diagnosis. The use of advanced liver MRI techniques such as diffusion weighted imaging (DWI), multi-arterial phase technique, hepatobiliary contrast agents, and artificial intelligence have improved the detection and differentiation of several focal liver lesions. Furthermore, liver MRI is often the last imaging technique used in the diagnostic algorithm before liver biopsy [7].

Simple liver cysts (SHCs) (also known as bile duct cysts or bile cysts) are congenital parts of the ductal tree detached from the main biliary system, which enlarge to become cystic lesions. There is no consensus on their actual origin. Some authors believe that they result from the dilatation of the bile duct hamartoma and do not communicate with the biliary tract. In the literature it is reported that their prevalence varies from 2.5 to 18%, they occur more frequently in women, with an incidence that increases with age. SHCs are benign lesions, which are usually asymptomatic. Cystic serous fluid is continuously produced by the cuboidal biliary epithelium. A very large cyst can cause abdominal pain or early satiety by squeezing. Complications, which can include bleeding or infection, are rare and can lead to the lesion turning into a complex cyst [8].

A ciliated hepatic foregut (CHFC) cyst is a rare cystic lesion that arises from the embryonic foregut with approximately 100 reported cases. Most commonly identified in segment IV of the liver, CHFC is typically asymptomatic and incidentally found on abdominal imaging. It is important to consider this entity in the differential diagnosis of atypical liver lesions since CHFC carries a risk of transformation into squamous cell carcinoma. A suspicion of CHFC is therefore an indication for surgical resection [9].

The prevalence of simple liver cysts is 4.5-7% and they tend to be more common in women than men with a ratio of 1.5: an infected liver cyst is a condition characterized by clinical symptoms such as fever and abdominal pain. Routes of infection include biliary, hematogenous, nearby sites of infection, trauma, and unknown. Overall, the routes of infection are most commonly unknown. Risk factors for infected liver cysts are female sex, age ≥ 40 years, diabetes mellitus, gallstone or biliary stricture, and pancreatic head duodenal surgery. A cyst diameter > 10 cm increases the likelihood of exclusionary symptoms in adjacent organs. However, there are no previous reports involving the pancreas [10].

Mucinous cysts are complex multiseptum cysts in which mural thickening, nodularity, debris-containing fluid, and hemorrhagic or protein-containing materials are frequently seen. Biliary mucinous cystic neoplasm (BMCN) is one of those mucinous cysts and is a rare benign cystic neoplasm of the biliary system, with an estimated incidence of approximately 5% of all hepatobiliary cystic neoplasms. BMCNs can present with a unique site that is different from their usual presentation and can communicate with the bile duct. They occur almost exclusively (85-95%) in middle-aged women [11].

Spontaneous rupture of a hemorrhagic liver cyst is extremely rare. There is no standard treatment recommended for this condition. Chogahara et al. [12], report two cases of hemorrhagic liver cysts that ruptured spontaneously and were successfully treated with laparoscopic deroofing. Their cases were: the first patient was an 85-year-old man hospitalized for right hypochondralgia and sudden-onset fever. Computed tomography revealed a 13 cm hepatic cyst occupying the right lobe of the liver and spontaneous rupture of the cyst. Laparoscopic deroofing was performed and continuous oozing from the cyst wall was found. In the second case, a 77-year-old woman who was being followed up for a simple liver cyst (13 cm) was hospitalized for sudden onset right hypochondralgia. CT demonstrated a 9.9 cm liver cyst occupying segment IV of the liver. Laparoscopic deroofing was performed and continuous oozing from the cyst wall was observed. Histological examination revealed a simple liver cyst. The patient was discharged on the sixth postoperative day.

Mo et al. [13], examined patients who received aspiration sclerotherapy with OK-432 (group A) or 99% ethanol (group B) for symptomatic simple liver cysts and included 42 patients in group A and 39 patients in group B. No significant difference was found in the mean liver cyst volume between the two groups. The overall success rates were 93% in group A and 79% in group B ($p = 0.08$). Treatment success for cyst volumes <200ml, 200-500ml and >500ml was 100, 93 and 88% in group A and 100, 85 and 57% in group B, respectively. The rate of symptomatic relief in group A it was higher than in group B for cysts 500 mL ($p = 0.049$) and cysts <500 mL. Regarding treatment-related complications, the incidence of injection site pain in group A was lower than in group B. His conclusion was: single-session OK-432 sclerotherapy was safer and more effective of multiple session 99% ethanol sclerotherapy for treatment of large cysts, although both treatments had similar effects on small cysts.

He et al. [14], presented the challenges of managing giant simple liver cysts causing obstructive jaundice and compared the safety and efficacy of percutaneous aspiration and lauromacrogol sclerotherapy with other management strategies. The case is a 39-year-old female with jaundice and liver function abnormalities. The images revealed a giant simple liver cyst with obstruction of the intrahepatic bile ducts. Subsequently, a combination of percutaneous catheter aspiration and sclerotherapy with lauromacrogol was performed, obtaining satisfactory efficacy. Therefore, a combination of percutaneous aspiration and lauromacrogol sclerotherapy may be suggested to resolve such cases.

Conclusion

Laparoscopic drainage of a liver cyst is a surgical treatment with excellent results, with high safety and low morbidity and mortality for these patients.

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