BRIEF REPORT

Treatment of a Patient with an Infected Hepatic Cyst

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Symptomatic hepatic cysts are infrequently seen by family physicians. We review the literature and describe the diagnosis and management of a patient with cystic liver disease and a dominant infected hepatic cyst. The treatment included percutaneous drainage, intravenous antibiotic therapy, and sclerotherapy infusion using sterile alcohol (95% ethanol).

KEY WORDS. Liver abscess; liver diseases; cysts; aspiration. *(J Fam Pract 1996: 43:577-580)*

Liver cysts may be congenital, postinflammatory, posttraumatic, or parasitic in origin.[1,2] Although congenital liver cysts may be found in 2.5% of the general population, they rarely become symptomatic.[3] A definitive diagnosis of liver cysts is established by clinical and imaging findings in conjunction with needle aspiration. Percutaneous catheter drainage and sclerotherapy are valid therapeutic procedures for hepatic cyst treatment. The clinical course and the successful treatment by these techniques in one patient with a complicated liver cyst are described.

Case Report

A 72-year-old African-American woman with an unremarkable past medical history came to our emergency room with a 7-day history of dull, noncramping, right upper quadrant pain unrelieved by pain medicines. She had noted a 30-lb weight loss in the last year associated with a decrease in appetite for the last few months. No other gastrointestinal, urinary, or gynecological symptoms were present. Her past medical history included no serious illness or hospitalization.

Examination revealed a thin elderly woman in no acute distress. Her body temperature was 98°F, blood pressure 141/67 mm Hg, and pulse 123 beats per minute. She had decreased breath sounds in her right lower lung as well as a dullness to percussion one third of the way up her right hemothorax. A large, nontender mass was palpable in the right lower quadrant. The mass extended across the abdomen to the left upper and lower quadrants. The genitourinary examination was inadequate because the abdominal mass prevented a proper evaluation of the adnexa. Minimal bilateral ankle edema was present. The physical examination was otherwise normal.

The complete blood count showed a white cell count (WBC) of 14,400/mm^3, with 71% segmented neutrophils, 11% band cells, 8% lymphocytes, and 10% monocytes. The hemoglobin was 10.4 g/dL, and the hematocrit was 31.3. The patient's liver-function profile showed a serum glutamic-oxaloacetic transaminase (SGOT) of 111 U/L (normal range 0 to 40 U/L) and a lactate dehydrogenase (LDH) of 231 U/L (normal range 60 to 165 U/L). The partial thromboplastin time (PTT) was 36 seconds (normal range 21 to 33 seconds). Hematology, liver, and serum chemistries were otherwise within normal limits. The urinalysis also was negative. Blood cultures and amoeba antibody studies were drawn and subsequently found to be negative.

A chest x-ray film showed atelectasis at the bases of the lungs with the right diaphragm elevated. An abdominal ultrasound showed a cystic mass with intraluminal homogeneous low-level echoes approximately 20 cm at the largest diameter. The cystic structure was mostly contained within the right lobe of the liver; smaller cysts were seen in the left lobe. The examination was otherwise normal.

In view of the patient's leukocytosis and uncer-

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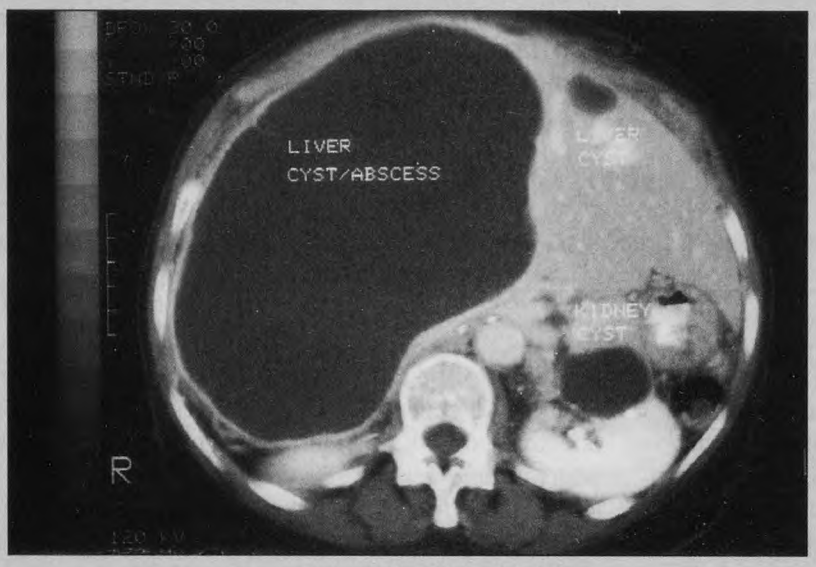
FIGURE 1

Pretreatment computed tomographic abdominal scan revealing large infected hepatic cyst, incidental hepatic cyst, and renal cyst.



tainty regarding the cause of her illness, she was empirically started on ampicillin sodium/sulbactam sodium, 1.5 g every 8 hours. This dosage was increased to 3.0 g every 8 hours the next day, when the patient's temperature rose to 102.3°F and the WBC to 31,600/mm^3.

The day after admission, an enhanced computed tomography (CT) scan of the abdomen confirmed a 20-cm fluid-filled, thin-walled mass consistent with the presence of a cyst that occupied most of the right lobe of the liver (Figure 1). The density of fluid was higher than expected in a purely cystic component. No calcifications, mural nodules, or pericystic fluid were present. The left lobe of the liver showed compensatory enlargement and multiple small cysts up to 3 cm in diameter.

Because of the patient's symptoms and the CT findings, the decision was made to percutaneously aspirate the larger cyst under CT guidance. Percutaneous drainage, by means of two catheters, yielded approximately 2000 cc of serosanguinous fluid. A cytologic evaluation of the fluid was negative for malignant cells, and a fluid analysis was described as predominantly inflammatory in nature. Cultures revealed a heavy growth of *Escherichia coli*, sensitive to ampicillin sodium/sulbactam sodium. Repeat blood cultures were negative. The catheters were left to gravity drainage that yielded initially over 50 cc daily and after a few days decreased to approximately 10 to 15 cc per day.

Because of the persistent drainage, a decision was made to proceed with sclerotherapy of the cyst once the patient recovered from the inflammatory process. Following sinography through the catheters, which at fluoroscopy showed no communication, 50 cc of alcohol (95% sterile ethanol) was injected and left in the cyst for approximately 40 minutes and then removed. Because drainage was still present, a second session of alcohol sclerosis was repeated the next day. During the patient's hospitalization, barium studies of the gastrointestinal tract failed to demonstrate abnormalities that would suggest a source of bacterial seeding.

After 16 days of intravenous ampicillin sodium/sulbactam sodium, the patient was switched to ceftriaxone, 2 g intravenously per day, based on culture and sensitivity reports, and discharged home for another 15 days of intravenous antibiotics. To prevent possible reaccumulation of the cyst, the drainage tubes were left in place to drain into a bag affixed to the patient's abdomen. Twenty-four days after the initial presentation, the patient had a repeat abdominal CT scan. It showed a significant improvement of abdominal organ alignment, and the residual cyst on the right lobe of the liver measured 2 cm in diameter (Figure 2). The daily output through the catheters averaged between 5 and 10 cc per day. Six days later the patient received a final sclerotherapy session consisting of 15 cc of 95% alcohol, and the catheters were removed.

Discussion

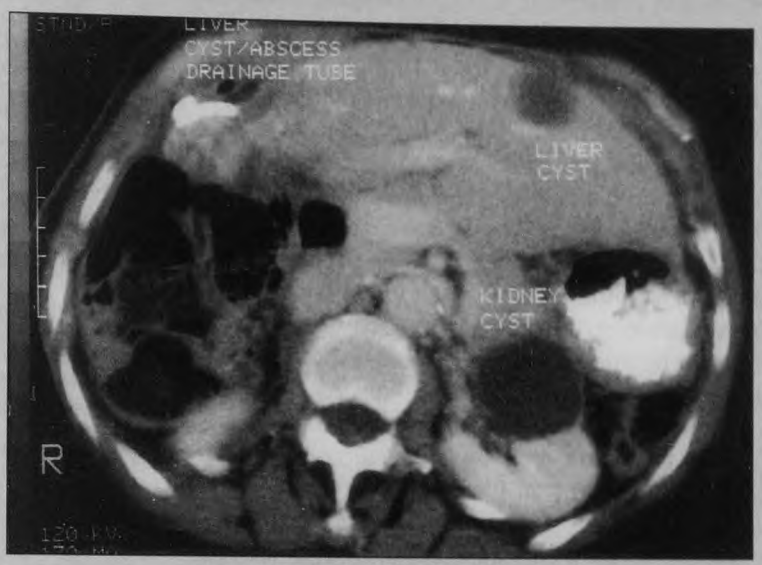
Liver cysts may be acquired or congenital. Acquired cysts are a result of trauma, inflammation, infection, or neoplasm.[1,2] Congenital cysts may be solitary, few, or multiple and may be associated with polycystic kidney disease. Polycystic liver disease is found in 30% of patients with polycystic kidney disease, although the patient's clinical course is usually determined by the renal involvement.[4] Congenital cysts are outlined by an epithelial lining and probably orig-

inate secondary to an embryonic maldevelopment of bile ducts.[5] They comprise 94% of all cysts and are the most common cysts seen in the Western world.[6]

Congenital liver cysts occur most often in women, and although they may reach a massive size, they usually remain asymptomatic throughout life. Since the overall hepatic parenchymal volume is unchanged, liver function tests also remain normal.[1] Symptoms, which tend to occur in patients 50 years or older, include abdominal mass, pain, jaundice, diminished appetite, and weight loss. These symptoms are often due to compression of nearby organs. Hemorrhage, perforation, torsion, and infection of the cyst may occur.[7] Ultrasonography and computed tomography are the procedures of choice for the diagnosis of liver cysts.[8,9]

FIGURE 2

Posttreatment computed tomographic abdominal scan revealing drain placed in residual hepatic cyst and improved alignment of abdominal organs.



While simple cysts have diagnostic sonographic and CT characteristics, complicated cysts must be differentiated from primary and secondary cystic or necrotic tumors, abscesses, hematomas, and parasitic cysts.[10] Spontaneous infection of a hepatic cyst occurs rarely. The organisms encountered most frequently are *Enterococcus*, *Escherichia coli*, and *Klebsiella pneumoniae*.[11,12] It is postulated that hepatic cysts, unlike renal cysts, become infected secondary to bacteremia, and the infection is usually monomicrobic.[11,12] The infection, however, may be unsuspected initially. Aspiration provides a definitive diagnosis of the nature of a cystic mass and should be performed when a cystic lesion is encountered and when the suspicion of tumor is high or when a history of sepsis is present. Any cyst fluid obtained should be analyzed with cytologic and bacteriologic studies. Despite the traditional concern regarding anaphylactic reactions, percutaneous drainage can also be performed safely and effectively in patients with a travel history that raises the possibility of hydatic cysts. In a series of 86 patient histories compiled from several recent studies, no major anaphylactic complications or seeding secondary to percutaneous intervention for hydatic liver disease have been reported.[13,14]

The conventional treatments for symptomatic hepatic cysts include internal drainage and excision through laparoscopy or laparotomy.[15-17] Internal drainage may be accomplished by unroofing the cyst intraperitoneally through laparoscopy. Cystoenteric anastomosis, total cyst excision, and enucleation or resection with or without partial hepatectomy are more complex surgical techniques that carry significant complications, including infection, pulmonary embolism, biliary leakage, and hepatic insufficiency.[18,19]

Surgical complications and the advent of radiographically guided aspiration and drainage procedures have led to attempts to treat symptomatic cysts without surgery. Unfortunately, simple aspiration and drainage of hepatic cysts uniformly results in recurrence.[20] However, the addition of sclerosing agents to aspiration has been therapeutic, and a variety of agents including minocycline,[21] pantopaque,[22] and more recently alcohol in 95% or 99% solution have been used successfully.[23,24]

The successful treatment of hepatic cysts by direct injection of alcohol was first reported by Bean and co-workers in 1985.[25] The technique of percutaneous alcohol sclerotherapy has been reported as being a successful treatment in over 80% of cases and at present is considered the therapy of choice for large symptomatic cysts.[26] Failure of the treatment may be secondary to the presence of multiple

cysts, treatment of the nondominant cyst, insufficient volume of alcohol, or too few sessions of treatment.[9] For large cysts, the amount of alcohol injected should correspond to approximately one-fourth to one-half of the cyst's volume, with repeated treatment depending on the amount of residual drainage.[25,26] Overall, this therapy is technically simple and usually without major complications. If a large volume of alcohol is used, a minimal risk of alcohol intoxication is present; other side effects include transient low-grade fever, hemorrhage into the cyst, and abdominal pain.[25] Communication of the cyst with the peritoneum or biliary tree is a contraindication to alcohol sclerotherapy, so catheter sinography under fluoroscopy is done at the time of aspiration and prior to sclerotherapy.

Our patient was readmitted to the hospital 3 months later for symptomatic calculous cholecystitis and underwent an uneventful cholecystectomy. The hepatic cysts were stable, and the treated cyst remained below 2 cm on ultrasound study. Although this possibility cannot be proved, cholecystitis may have been the source of bacterial seeding into the hepatic cyst.

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