

Alcohol sclerosis of a giant liver cyst following failed deroofings

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Radiology Case. 2011 Feb; 5(2):19-22 :: DOI: 10.3941/jrcr.v5i2.634

ABSTRACT

Percutaneous alcohol sclerotherapy for simple liver cysts is an established and safe procedure. We report alcohol ablation of a very large (5.5 liters) liver cyst that had failed laparoscopic deroofing procedures twice. The cyst responded to multisession alcohol sclerotherapy.

CASE REPORT

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A 61-year-old woman presented with cystic disease of the liver. There were about four cysts 5 cm in diameter or smaller. But one cyst was very large measuring 23 cm in largest diameter. This cyst had been laparoscopically deroofed twice, six years and three months prior to presentation.

Three months following the second laparoscopic procedure, the patient clinically presented with the return of her symptoms of upper abdominal dragging pain and early satiety. She had experienced these symptoms prior to the two laparoscopic procedures. On physical examination the patient was afebrile, vital signs were normal; she had a visible bulge in the right upper abdomen that was firm to palpation but not tender. Laboratory testing revealed normal liver function and hematologic tests. The clinical diagnosis of the recurrent hepatic cyst was confirmed on contrast enhanced abdominal computed tomography (CT). CT showed fluid reaccumulation in the previously deroofed, recurrent, liver cyst now measuring 18 x 23 cm (Fig. 1). A joint decision was then made by the surgeon, radiologist and the patient to attempt percutaneous alcohol sclerotherapy. The other smaller cysts were asymptomatic and did not require treatment.

Patient's clinical and imaging data were carefully reviewed. After informed consent, the procedure was

performed with the patient positioned supine on the angiography table. Moderate sedation was used; a total of 2 mg of Midazolam (Versed, Hospira Inc., Lake Forest, IL), and 100 mcg of Fentanyl Citrate (Hospira Inc., Lake Forest, IL), titrated over 90 minutes. Under real-time ultrasound-guidance, an 8 French drainage catheter (SKATER® All-purpose drainage catheter, Angiotech) was advanced into the cyst through a thin layer of normal liver parenchyma to avoid peritoneal leakage. The catheter was connected to wall suction via a stop cock. A total of 5,250 liters of brownish clear non purulent fluid were aspirated to empty the cyst. To exclude biliary communication, 150 ml iodinated contrast (Iopamidol, Isovue-370) was injected in the cyst cavity under fluoroscopic control. No communication was found with the biliary tree, retroperitoneum, or peritoneal cavity (Fig. 2). The contrast was aspirated, and replaced with 50 ml of 1% Lidocaine hydrochloride. In an attempt to anesthetize the cyst lining, the patient rolled over 5 minutes each in the left decubitus, prone, right decubitus, and supine position. The Lidocaine was then aspirated. Next, 130 cc of 98% dehydrated alcohol (American Regent, inc., Shirley, NY) were injected in the cyst via the drainage catheter and the stop cock was closed. With Alcohol in the cyst, patient was rolled over 10 minutes each on her sides, prone and supine positions with a total alcohol exposure time of 40 minutes. The cyst cavity was then aspirated using a 60 cc syringe and drained into a drainage bag. The catheter was secured to the skin, stop cock closed and the patient

transferred to the recovery area. Four hours later, another "alcohol treatment", consisting of the Lidocaine and Alcohol in similar volume and duration, was given at the patient's bedside following which the cyst was emptied. Patient was admitted overnight for observation. One more "alcohol treatment" was administered the following morning. The patient was discharged home with the drainage catheter secured to the skin covered with sterile dressing. No adverse reactions or complications were encountered.

Follow-up CT scan in two weeks demonstrated recurrence of the cyst to the same dimensions as prior to the first set of treatments. The "treatment" was repeated with total alcohol exposure time of three hours. At two week follow up the cyst had become smaller with a capacity of 2.5 liters. In the subsequent two weeks, two further "treatments" were administered with alcohol exposure time of 40 minutes each. In all, the patient underwent a total of six "treatments" with an estimated total alcohol exposure time of 380 minutes. Two weeks and six months follow-up CT studies showed stable 6 cm residual cavity filled with solid material most likely from adhesions secondary to alcohol ablation (Fig. 3). At one year, the patient remains symptom free.

DISCUSSION

Simple hepatic cysts are considered congenital in origin arising from aberrant bile ducts isolated from the main biliary tree [1]. They are encountered relatively frequently in up to 5% of the population with only 15 to 16% of such cysts being symptomatic [2,3]. Diagnosis of simple liver cysts is made based on imaging criteria (Table. 1). On ultrasound, simple cysts appear anechoic which no internal echoes, and demonstrate posterior acoustic enhancement. On CT, they appear as a well defined homogeneous hypodense mass with no calcifications or soft tissue component and show no enhancement. On magnetic resonance imaging (MRI), simple cysts show homogeneous low signal intensity on T1-weighted images and high signal intensity on T2-weighted images, with no soft tissue components, internal septae or enhancement. The differential diagnosis for simple liver cysts includes cystadenoma, polycystic liver disease when multiple, and echinococcal cyst in endemic regions.

The management of symptomatic liver cysts has evolved from open surgical to laparoscopic fenestration with deroofing, and percutaneously from simple aspiration to aspiration combined with sclerotherapy [4] (Table. 2).

Dehydrated alcohol (95-99%) has been the most widely used sclerosing agent, although minocycline, tetracycline, and doxycycline are other sclerosants being used to treat hepatic cysts. There is no consensus on the amount of alcohol, exposure time, and number of treatments. But there is general agreement on the maximum amount of alcohol at 200 cc or 20 - 40 percent of the aspirated volume and that the alcohol be aspirated at the end of the procedure [5,6]. Reports have indicated optimal results with single or multiple sessions and an exposure time of 10 to 240 minutes. But all patients should

be closely monitored for local complications related to percutaneous access (bleeding, infection), peritoneal and biliary spillage (intense pain and biliary strictures) and systemic absorption of alcohol leading to systemic hypotension, increased pulmonary vascular resistance and myocardial toxicity [7]. Alcohol absorption in patients with formaldehyde dehydrogenase deficiency may lead to life threatening hypotension requiring prolonged treatment [7]. It is of utmost importance to exclude communication with bile ducts using intra-cystic iodinated contrast.

TEACHING POINT

Percutaneous alcohol ablation of recurrent cyst can be achieved after failed surgical management. Multiple sessions may be required to treat a very large cyst.

REFERENCES

1. Melnick PJ. Polycystic liver disease: analysis of seventy cases. *Arch Pathol* 1955; 59:162-172.
2. Gaines PA, Sampson MA. The prevalence and characterization of simple hepatic cysts by ultrasound examination. *Br J Radiol* 1989; 62:335-337.
3. Lai ECS, Wong J. Symptomatic non parasitic cysts of the liver. *World J Surg* 1990; 14:452-456.
4. Moorthy K, Mihssin N, Houghton PWJ. The management of simple hepatic cysts: sclerotherapy or laparoscopic fenestration. *Ann R Coll Surg Engl* 2001; 83:409-414.
5. Larssen TB, Rosendahl K, Horn A, Jensen DK, Rorvik J. Single-session alcohol sclerotherapy in symptomatic benign hepatic cysts performed with a time of exposure to alcohol of 10 min: initial results. *Eur Radiol* 2003; 13:2627-2632.
6. Yang CF, Liang HL, Pan HB, Lin YH, Mok KT, Lo GH, et al. Single session prolonged alcohol-retention sclerotherapy for large hepatic cysts. *AJR* 2006; 187:940-943.
7. Gleczer RK, Charboneau JW, Hussain S, Brown DL. Complications of percutaneous ethanol ablation. *J Ultrasound Med* 1998; 17:531-533.

FIGURES

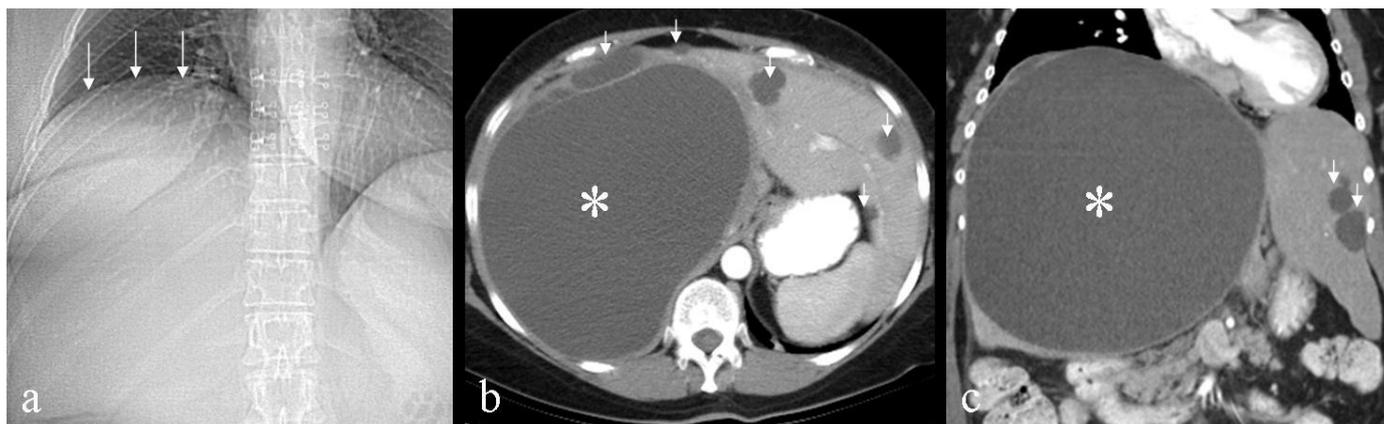


Figure 1: 61-year-old female patient presented with recurrent fullness in her right upper abdominal quadrant following laparoscopic deroofing of a large liver cyst. Scout (a), Axial and coronal contrast enhanced (IV and PO) CT image through the liver obtained in the equilibrium phase (b,c), show marked elevation of the right hemi-diaphragm (long white arrows) secondary to a giant liver cyst occupying the right upper abdominal cavity (asterisk). Note the presence of several other smaller cysts seen in the right and left lobes of the liver (short white arrows). [Technique: KVp = 120; mA = 280; Slice Thickness = 5.00 mm; Dose of intravenous contrast: Iopamidol (Isovue-300), 100 ml].

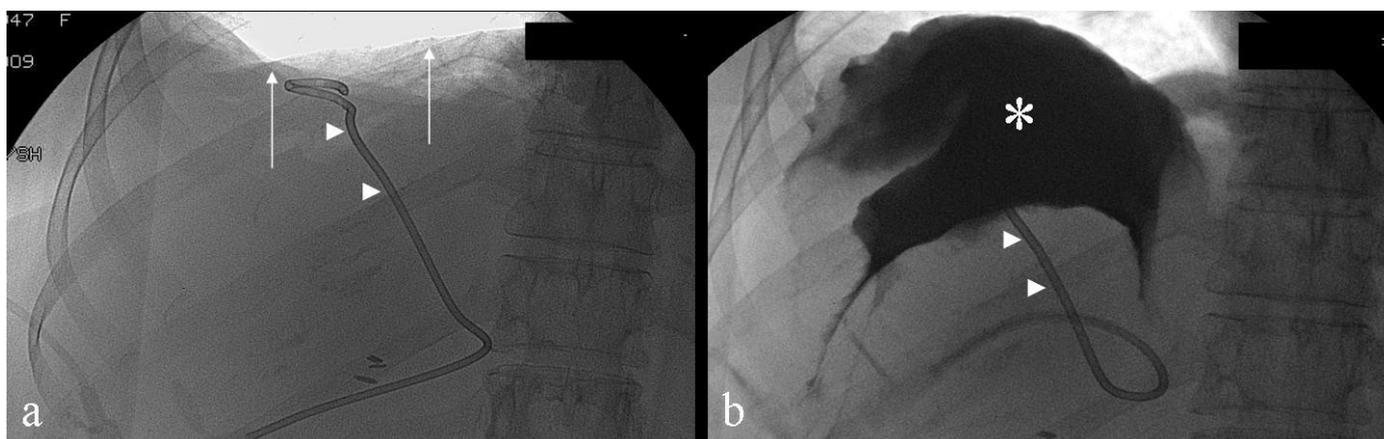


Figure 2: 61-year-old female patient presented with recurrent fullness in her right upper abdominal quadrant following laparoscopic deroofing of a large liver cyst. Spot radiographic images, part of initial cyst aspiration and alcohol sclerotherapy procedure. a: spot image over the right upper quadrant demonstrates a pigtail catheter (arrowheads) draining the giant liver cyst. Note the collapse of the cranial contour of the cyst following drainage (long white arrows). b: 150 ml of hydrosoluble iodinated contrast (Iopamidol, Isovue-370) were infused inside the cyst cavity (asterisk) through the pigtail catheter (arrowheads) under fluoroscopic guidance. Note the rise of the cranial contour of the cyst as well as of the diaphragm.

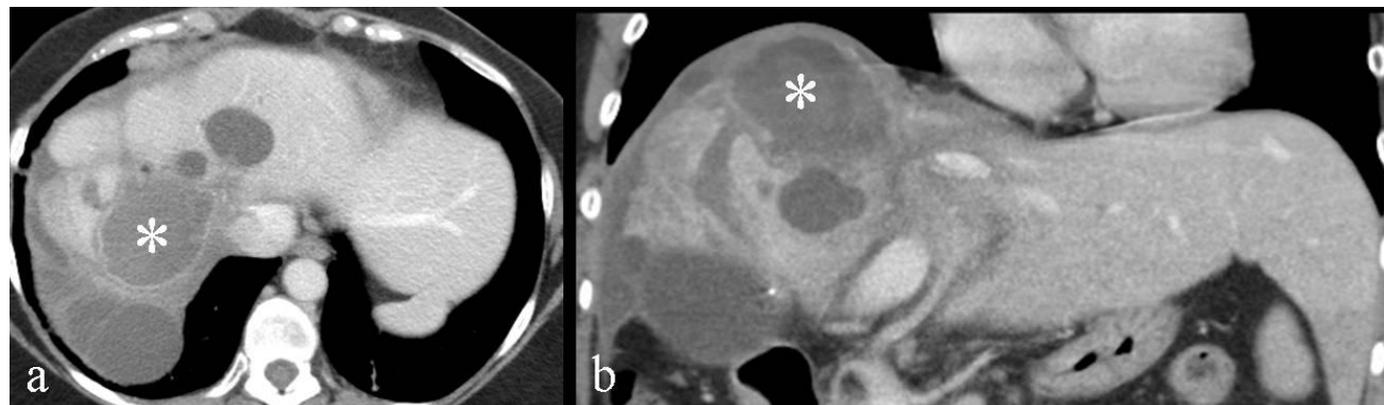


Figure 3: 61-year-old female patient following sclerotherapy of a large liver cyst. Axial (a) and coronal (b) contrast enhanced (IV and PO) CT images through the liver obtained in the equilibrium phase demonstrate stable residual cyst cavity measuring 6 cm and contains internal solid material most likely from adhesions. Note the presence of scarring and anatomical distortion of the surrounding right lobe liver parenchyma, likely related to inflammatory reaction secondary to alcohol ablation. [Technique: KVp = 120; mA = 356; Slice Thickness = 4 mm; Dose of intravenous contrast: Iopamidol (Isovue-370), 100 ml].

	Ultrasound	CT	MRI T1	MRI T2	Pattern of contrast enhancement
Simple hepatic cyst	- Anechoic - Posterior acoustic enhancement - Thin walled	- Thin walled - Homogenous - Water attenuation.	Low (homogenous)	High (homogenous)	None
Cystadenoma	- Anechoic mass - Echogenic internal septations	- Multiloculated with water attenuation - Calcifications	Low (homogenous)	High (homogenous)	Wall enhancement
Hydatid cyst	- Internal septations +/- Daughter cysts - Calcifications	- Thick walled - Calcifications - Internal septations +/- Daughter cysts	Hypointense rim	Hypointense rim	Wall may enhance
Polycystic liver disease	Innumerable simple cysts	Innumerable simple cysts	Low	High	None

Table 1. Differential diagnosis of liver cysts

Etiology of simple hepatic cyst	Congenital, arising from aberrant bile ducts isolated from the main biliary tree.
Incidence	Occur in up to 5% of population. Only 15-16% are symptomatic. Women over 50 years of age more commonly have symptomatic cysts.
Clinical manifestations	Depend on size. Usually abdominal pain or mass.
Imaging findings	Ultrasound: simple anechoic cysts which lack internal echoes. CT: Well defined homogeneous hypodense mass with no calcifications or soft tissue component.
Treatment	Asymptomatic: Observation Symptomatic: Laparoscopic fenestration and deroofing, or percutaneous aspiration and sclerotherapy.
Prognosis	Extremely rare complications include rupture, infection, hemorrhage, and development of malignancy within the cyst. Often recur following treatment.

Table 2. Summary table for simple hepatic cyst

ABBREVIATIONS

CT = Computed tomography
MRI = Magnetic resonance imaging
US = Ultrasound
cm = Centimeters
ml = Milliliters
mg = Milligrams
mcg = Micrograms

KEYWORDS

Alcohol sclerosis; hepatic cyst sclerosis; liver cyst sclerosis; Alcohol ablation

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