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Case Report

Giant hepatic cyst as a cause of gastric outlet obstruction

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ABSTRACT

We describe the case of a 58-year-old female who presented to her primary care provider with lifelong anorexia, 6-week history of liquid only diet and new onset epigastric abdominal pain radiating to the back accompanied by nausea and abdominal distension. An initial computed tomography scan with contrast demonstrated a massive simple hepatic cyst with mass effect compression of the duodenal sweep. Repetitive treatment with aspiration sclerotherapy using hypertonic saline provided initial resolution of symptoms and led to substantial reduction of cyst diameter. Repeat imaging demonstrated complete drainage of the cyst and decompression of the duodenum. Ultimately, the patient's symptoms returned 6 weeks later at which time she opted for surgical deroofing of the cyst. Surgery provided for complete resolution. This case appears to be the first to document the compression of second portion of the duodenum by a massive simple hepatic cyst causing anorexia and mimicking gastric outlet obstruction.

Introduction

The prevalence of cystic hepatic lesions in the United States is estimated to be as high as 15%-18%. Of these, the simple hepatic cyst is the most common, found in 2.5%-18% of the population [1]. Simple cysts occur as fluid filled structures with a diameter that can range from <1 cm up to 30 cm. They have thin walls and are lined by a cuboidal epithelium [2]. The pathogenesis of most simple hepatic cysts is of congenital origin, thought to be derived from biliary ducts that are not connected to the biliary system, as a consequence of a malformation of the ductal plate during embryonic development [3].

Simple hepatic cysts are most commonly asymptomatic and are identified as an incidental finding on imaging for other reasons [4]. Large cysts may produce abdominal pain, vague discomfort or abdominal fullness, early satiety, palpable mass, or abdominal distention [5]. The symptomology

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Fig. 1 – Contrast-enhanced CT scan, axial projection, on the day of hospital admittance, demonstrating a large liver cyst in a 58-year-old female.

of different types of hepatic cysts often overlaps; therefore, symptoms alone are not enough to establish the diagnosis. However, when combining the symptomology with physical exam, imaging characteristics, and laboratory investigation, a narrow differential can be made.

Here, we describe a truly unique case involving a patient with lifelong anorexia found to have a large simple hepatic cyst. The cyst was large enough to cause mass effect compression of the duodenal sweep, causing digestive stenosis and early satiety and symptoms of gastric outlet obstruction. The patient's symptoms of anorexia were initially relieved following hypertonic saline sclerotherapy leading to massive reduction of the cyst and relief of mass effect on the duodenum. Ultimately, the cyst was refractory to sclerotherapy and required surgical resection. To the best of our knowledge, this is the first report detailing lifelong anorexia as a result of a massive simple liver cyst that caused mass compression at the duodenal sweep.

Case report

A 58-year-old female presented to her primary care physician with 24 hours of severe epigastric pain radiating to her back accompanied by nausea, abdominal distension, and shortness of breath. She had lifelong anorexia and a 6-week history of liquid only diet. On admission, her height was 5 feet 5 inches, weight 113 pounds, and BMI 18:8. On physical exam, she had extreme, sharp pain to palpation of the left and right upper quadrants of the abdomen. She reported lifelong early satiety, bloating, and feeling of abdominal pressure. Chest radiographs identified no findings and she was referred for additional imaging. An initial enhanced computed tomography (CT) scan revealed a large simple hepatic cyst measuring 16.5 cm × 14.2 cm in diameter (Figs. 1 and 2) and compression of the duodenal sweep (Figs. 3 and 4). The Hounsfield measurement of the cyst was between 6.8 and 11.4 HU. Nineteen

Fig. 2 – Contrast-enhanced CT scan, sagittal projection, on the day of hospital admittance, demonstrating the large liver cyst.

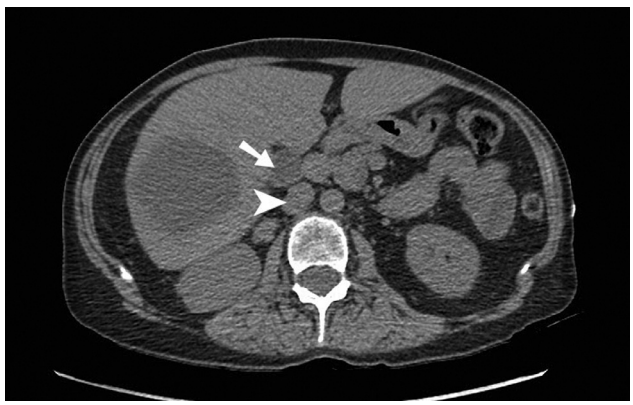

Fig. 3 – Unenhanced CT image, axial projection, on the day of hospital admittance, showing the second portion of the duodenum (arrow) shifted in position and lying anterior to the inferior vena cava (arrowhead).

days later, the patient underwent CT guided aspiration of the simple hepatic cyst. 1800 cc of cloudy brownish cystic fluid was drawn off and sent to pathology. Sclerotherapy using 240 cc of 3% hypertonic saline was initiated and a Jackson-Pratt drainage catheter was placed. CT imaging at this time showed complete drainage of a liver cyst (Fig. 5). One week later, the patient returned for repeat imaging and sclerotherapy treatment. At this point, compression of the second portion of

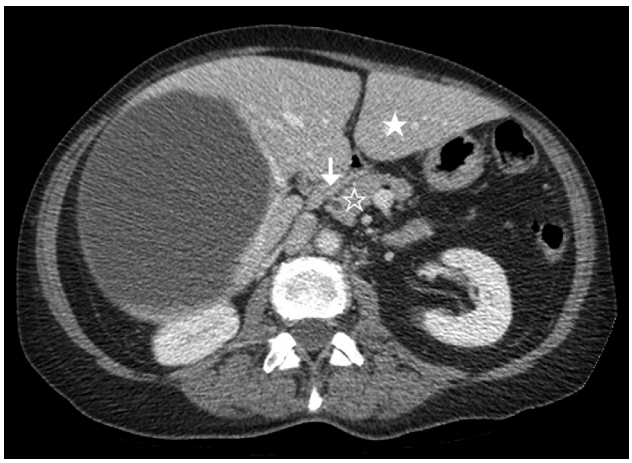

Fig. 4 – Contrast-enhanced CT scan, axial projection, on the day of hospital admittance, showing the duodenum (arrow) wedged between the pancreas (open arrow) and left hepatic lobe (solid star).

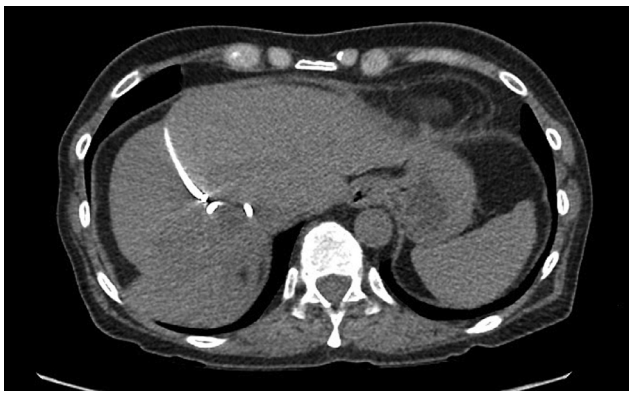

Fig. 5 – Unenhanced CT image, following the first round of aspiration of the simple liver cyst and sclerotherapy with 3% hypertonic saline. The procedure was performed 19 days after the original date of hospital admittance. Note complete drainage of the cyst.

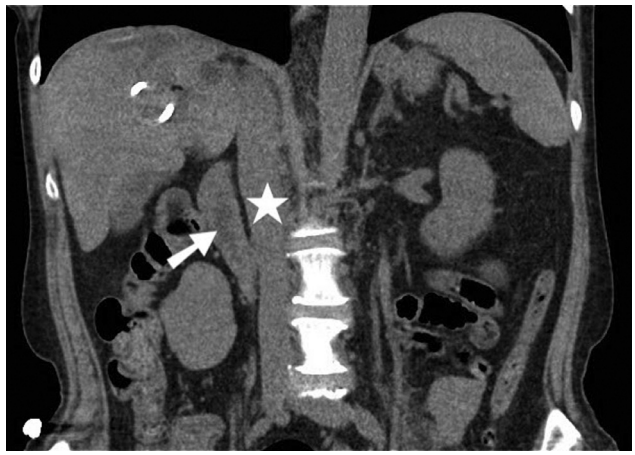

Fig. 6 – Unenhanced CT image, coronal projection, following the second round of aspiration and sclerotherapy. The procedure was performed 7 days after the first round of sclerotherapy. Note the duodenum (arrow) shifted to the right of the inferior vena cava (star) following complete drainage of liver cyst.

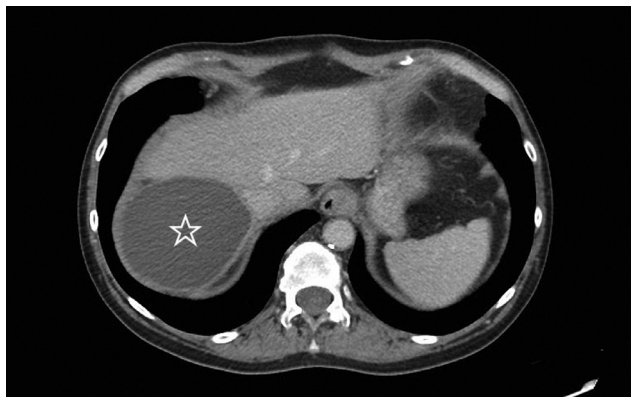

Fig. 7 – Contrast-enhanced CT image, axial projection, revealing a recurrent but much smaller liver cyst (star) 6 weeks after the second round of sclerotherapy.

the duodenum had been relieved (Fig. 6). After a third and final round of sclerotherapy performed 9 days after the second round, the patient reported total resolution of her symptoms. The patient maintained total resolution of symptoms, was able to eat, and reported frequent hunger pains and weight gain. However, approximately 6 weeks later her symptoms returned, and she again complained of abdominal fullness, boating, and anorexia. Enhanced CT imaging revealed a recurrent but much smaller cyst 8.2 cm × 6.6 cm in diameter (Figs. 7 and 8) and decompression of the duodenum. The duodenal sweep was found to have shifted approximately 3-4 cm from the left to the right as a result of the earlier drainage and sclerotherapy (Fig. 8). At this time, the patient opted for surgical resection. The pathology report confirmed the diagnosis of a benign hepatic cyst. The postoperative period was uneventful and on follow-up 6 weeks later, the patient reported no signs or symptoms of recurrence.

Discussion

The patient presented in this report is a 58-year-old female who was diagnosed with a massive simple liver cyst. Most hepatic cystic lesions are benign, asymptomatic lesions, diagnosed incidentally, and require no intervention. A total of 15%-16% patients with hepatic cysts will become symptomatic [6]. Large symptomatic cysts require further evaluation, and an accurate diagnosis is essential for selecting the appropriate treatment. Imaging represents a primary modality for establishing the diagnosis of a simple hepatic cyst. Typically, cyst size is not helpful as the various types of cystic lesions can all vary dramatically in size. Cyst fluid is usually acellular and cannot be used to differentiate simple cysts from other cysts [7]. Ultrasound is most often used as the first choice for characterization of hepatic cystic lesions. Simple hepatic cysts

Fig. 8 – Contrast-enhanced CT image, axial projection, showing duodenum (solid arrow) shifted 3-4 cm to the right of inferior vena cava (open arrow) as a result of treatment but also revealing the recurrent, smaller liver cyst (star). Image collected 6 weeks after the second round of sclerotherapy.

are smooth, anechoic, and without septations. They have a well-defined tissue-fluid interface with surrounding hepatic parenchyma, producing a characteristic acoustic posterior enhancement [8]. Ultrasound has a sensitivity and specificity of roughly 90% for diagnosing simple liver cysts. While CT and magnetic resonance imaging may improve this sensitivity, due to radiation load and cost, ultrasound remains the primary diagnostic tool [9].

Treatment of symptomatic hepatic cysts is aimed at cystic volume reduction and involves either percutaneous aspiration or surgical intervention. Aspiration alone is not recommended for definitive therapy as there is a nearly 100% recurrence rate [10]. As such, aspiration with the addition of a sclerosing agent is used as a treatment modality [4,11–12]. A multicenter study of 86 patients with hepatic cysts greater than 5 cm found that aspiration sclerotherapy is highly efficacious [13]. The authors report reduction or complete resolution of symptoms in 89.6% of cases. Different treatment protocols for aspiration sclerotherapy have been published, all with the goal of destroying the secretory epithelium [14]. These differ in terms of sclerosing agent, volume instilled, and exposure time [15–19]. Ethanol is the most common sclerosing agent as it is cost effective, safe, and widely available. Unfortunately, ethanol sclerotherapy has its downfalls and has been associated with pain and the potential of intoxication [20]. Due to the large size and volume of the cyst in the patient we report here, the nonstandard therapy of hypertonic saline [16] was utilized to avoid intoxication with ethanol and therefore for the safety of the patient.

In regard to the success of sclerotherapy, there are 2 components to consider: the clinical response and the technical response defined by size of cyst reduction. For aspiration sclerotherapy of large symptomatic hepatic cysts, Wijnands et al [21] report that strong hepatic cyst reduction is the best predictor of clinical response. Additionally, these authors found that hemorrhagic cyst aspirate and a limited cyst size reduction at 1 month predicted suboptimal long-term cyst size reduction but did not affect clinical response [21]. That cyst diameter reduction should not be a primary outcome is corroborated by Neijenhuis et al [22]. They emphasize the dissociation between morphological response and patient reported outcomes. Patient reported outcomes are gaining acceptance as valid primary endpoints in studies of patients with symptomatic conditions [23].

Surgical intervention is an alternative to sclerotherapy for the treatment of symptomatic hepatic cysts. Options include laparoscopic or open fenestration as well as resection. In a fenestration procedure the cyst is opened to the peritoneal cavity, and a portion of the wall is excised flush with the adjacent liver parenchyma [3]. A benefit of this approach as compared to sclerotherapy is that a portion of the cyst wall can be pathologically examined. This approach is best suited for cysts located superficially and in the anterior segments of the liver. Surgical intervention is indicated when a cyst recurs after percutaneous sclerotherapy with concomitant increase in abdominal complaints. Due to the absence of controlled trials comparing sclerotherapy to fenestration, no firm recommendations can be made between the 2. Sclerotherapy is a reasonable alternative to those at higher risk of surgical complication or cysts that are not amenable to fenestration [24]. In the patient we present here, the simple hepatic cyst was refractory to hypertonic saline sclerotherapy and ultimately required surgical unroofing.

This case is notable for the highly unusual and clinically significant mass effect produced by a massive simple hepatic cyst on the duodenum. The resulting symptoms mimicked those of gastric outlet obstruction. The differential diagnosis for gastric outlet obstruction commonly involves duodenal or extraluminal disease. The identification of *Helicobacter pylori*, and the use of proton pump inhibitors, has shifted the majority of gastric outlet obstructions from benign to malignant processes [25]. Up to 25% of patients with pancreatic cancer will present with obstruction. Distal gastric cancer accounts for up to 35% of gastric outlet obstructions [26]. Rarer extrinsic causes of gastric outlet obstruction include Bouveret syndrome and large gastric polyps [27].

Broadly, this case helps underscore the potential adverse effects hepatic cysts may have on adjacent structures. Cysts within the liver parenchyma are in contact with both the vascular and biliary systems. The resulting compression is usually well tolerated but it may lead to inferior vena cava obstruction, Budd Chiari syndrome, obstructive jaundice, and portal hypertension [28]. To the best of our knowledge, clinically significant external compression of the duodenal sweep by a simple hepatic cyst has not been reported.

Conflicts of interest

None.

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