MULTIPLE HEPATIC ABSCESSES FROM A RUPTURED GALLBLADDER EMPYEMA – A CASE REPORT AND REVIEW OF THE LITERATURE

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ABSTRACT
An unusual complication of gallbladder empyema is its rupture into the liver forming a pyogenic abscess. This condition is rapidly fatal in diabetic and Immuno-compromised patients.
We present a 79-year-old african american woman with diabetes mellitus who presented at the ED with constitutional symptoms and abdominal pain of a week duration. She was tender in the upper right quadrant, had a positive murphy’s sign on clinical examination, tachycardia and a low-grade fever and laboratory findings of leukocytosis, and metabolic acidosis, lactic academia and elevated ketones with moderately deranged hepatic function tests and negative tumor markers. Management consisted of broad spectrum antibiotics, an open cholecystectomy and drainage of two multiloculated hepatic abscesses. A repeat ultrasonogram showed a remnant collection that was drained by interventional radiology and drains left in-situ. She was discharged after four weeks of parenteral antibiotics with repeat sonogram showing complete resolution of hepatic abscess.
Appropriate antibiotic management, laparoscopic or open cholecystectomy or radiology guided cholecystostomy and drainage of hepatic abscesses is the hallmark of management.

KEYWORDS Hepatic; Gallbladder; Pyogenic, Cholecystohepatic; Abscess; Empyema

Introduction
We presented a rare case of simultaneous presentation of multiple hepatic abscesses secondarily to a cholecystohepatic communication from a perforated gallbladder empyema in a 79-year-old woman with diabetes mellitus. The patient was managed successfully by open cholecystectomy and open drainage of the hepatic abscesses. Conservative management by initial percutaneous drainage may be indicated for clinically unstable patients with subsequent cholecystectomy when stable.

Case Report
79-year-old african american woman with diabetes and hypertension, who was brought to the Emergency Room by daughter with complaints of malaise, right upper abdominal pain, anorexia and multiple episodes of vomiting of a week duration. No recent travels. Initial vitals was 118/82 mmHg Pulse of 130/min Temp of 101.2 F and blood sugar of 550 mg/dl. On clinical revealed an elderly lady, anicteric, the abdominal examination showed right upper quadrant tenderness, positive murphy sign, normal chest examination. Leukocytosis-21.3 thousand, neutrophil percentage of 88.7 percent, hemoglobin of 13, Human Immunodeficiency Virus-negative, Hepatic function showed moderately elevated liver enzymes with an Aspartate transaminase-232, alanine transaminase-99, alkaline phosphatase-251, a total bilirubin of 1.3, direct bilirubin of 0.1,
Fig 1: Sagittal CT scan is showing two large hepatic abscesses and enlarged fluid filled gallbladder.

Fig 2: Axial CT slice is showing two hepatic abscesses and enlarged gallbladder with air-fluid levels.

Fig 3: Axial CT slice 72 hours following surgery showing near normal liver parenchyma and drain in situ.

Fig 4: Repeat ultrasound after three weeks showing complete resolution of hepatic collections.

hypoalbuminemia of 1.8 mg/dl, normal amylase and lipase levels. Serum electrolytes - Sodium of 127, potassium was 3.8, chloride was 99, serum lactate on admission was 4.8 and serum bicarbonate was 14mg/dl. Tumor markers -alpha-fetoprotein, Carcinoembryonic antigen and Ca -125 were normal.

Abdominal Computed tomographic (CT) scan (Fig 1 and Fig 2) showed multiloculated complex fluid collections with multiple internal septations and air-fluid levels within the right lobe of the liver measuring 4.9 x 6.6 x 8.8 cm and 6.1 x 3.3cm-highly suggestive of hepatic pyogenic abscesses and a markedly enlarged gallbladder with intraluminal air-fluid levels. There was no free air or evidence of diverticular or metastatic disease. Broad spectrum antibiotics - Ppiperacillin and tazobactam, vancomycin, and metronidazole administered within the first hour of admission, and she admitted to the Surgical Intensive care unit for crystalloid resuscitation, glycemic control. She was taken urgently to surgery for open cholecystectomy with open drainage of the gallbladder and the liver abscesses. 100 milliliters of purulent material was drained multiple gallbladder stones retrieved. Drains left in place.

A repeat sonographic evaluation 24 hours following surgery revealed a persistent abscess collection that was drained by radiology - guided aspiration and drains left in-situ. The significant radiographic resolution noted on repeat imaging (Fig 3). Positive blood cultures and gallbladder cultures grew klebsiella pneumonia, and she was continued antibiotic-specific therapy until repeat cultures were negative. The patient remained on admission for 27 days; respiratory failure complicated her hospital course, a tracheostomy placed and she eventually weaned from the ventilator. Significant resolution of the abscess collection confirmed on ultrasonography (Fig 4), and she successfully discharged to a nursing home for continued rehabilitation.

Discussion

Development of multiple pyogenic hepatic abscesses from a perforated gallbladder empyema in an immunocompetent patient is very unusual with very few documented case reports and case series in the literature. Untreated gallbladder disease may progress to gallbladder empyema, gangrene with subsequent rupture and development of a paracholecystic or a cholecystohepatic abscess. The overall incidence of pyogenic hepatic abscesses is an estimated 10 - 20 cases per 100,000 persons in the United States with a male- to - female ratio of 2:1 and age range of 40 to 60 years [1-3].

Hepatic abscesses may be primary or secondary in origin. They may arise primarily from blunt or penetrating hepatic trauma or hepatic tumor necrosis or secondarily from biliary perforation or contiguous spread from a perforated appendicular, diverticular or inflammatory bowel disease. Septic hepatic abscesses rarely may complicate biliary strictures, choledocholithiasis or procedures such as Endoscopic Retrograde Cholangiopancreatography for biliary stones with cholangitis [1-3]. The blood-borne spread of septic emboli from an infectious cardiothoracic or abdominal foci has also been described [1]. Predisposing factors include age, medical conditions such as diabetes mellitus, immunosuppressed states such as solid or hematologic malignancies, cancer chemotherapy, Tumor necrosis factor inhibitor treatment, hemoglobinopathies, HIV/AIDs and chronic Kidney disease patients on hemodialysis.

Gallbladder empyema and gangrene arises as a result of gallbladder wall distension and necrosis from impaired venous and lymphatic drainage from accumulation of purulent bile in the setting of cystic duct obstruction from gallstones – or a calcu-
losus cholecystitis [1-3]. Neimer described three classes of gal-
bladder perforation in 1934, class one is described as an acute
free gallbladder rupture, classes two and three describe chronic
percholecystic abscess and chronic cholecystenteric fistulation
respectively [4]. A fourth class of cholecystobiliary fistulation
has been proposed by Anderson and Nazem [4,5].

Multiple pyogenic hepatic collections present more acutely.
The interval of presentation may range from 5 to 120 days be-
tween the onset of symptoms of gallbladder disease and dis-
covery of hepatic collections as a complication [1]. Our patient
presented simultaneously with the hepatic abscesses and a gan-
grenous gallbladder and a short (1 week) duration of symp-
toms. Most patients present with constitutional symptoms such
as fever and malaise coupled with right upper quadrant pain.
They may present with septic shock coupled with features of
end-organ damage such as altered mental status or acute kid-
ney injury. There is typically a delayed presentation of hepatic
abscesses occurring following surgical intervention for acute
cholecystitis or biliary tree disease [1].

Hepatic pyogenic cultures are very dependent on the origin
of infection are often poly-microbial. The most frequent bac-
teria isolated from cultures are Escherichia coli and Klebsiella
pneumonia. Parasites such as Ascaris lumbricoides and Enta-
moeba histolytica may be an etiology following visits to endemic
regions [1-3]. Abnormal hepatic profile reflects the deranged
liver physiology from the hepatic collection or the secondary
cholestatic effect of compression of the distended gallbladder
empyema sac against the common bile duct or hepatic ducts
[1-4]. Ultrasound and an abdominal computed tomographic
(CT) scan typically guide therapeutic management [6, 7]. CT
may show a fluid-filled distended gallbladder with an adjacent
circumscribed hepatic collection with surrounding contrast en-
hancement coupled with lack of hepatic continuity with the
gallbladder wall [1, 2] There may be evidence of biliary tree
malignancy or hepatic metastasis [1, 2].

Management of concomitant liver and gallbladder abscesses
is mostly dependent on the clinical state of the patient and could
either be a surgical or percutaneous image - guided drainage.
Heneghan et al. (2011) recommend open drainage of hepatic
abscesses following non-radiographic or non-clinical resolution
72 hours following radiologic - guided drainage or serial as-
piration. Large multi-loculated and thick-walled collections
with viscid pus would be more appropriately managed surgi-
cally [1]. In our case, we opted for open drainage because the
patient was clinically stable for surgical intervention and the
radiographic findings of large dual thick-walled hepatic abscesses
and a concomitant gallbladder empyema met the criteria for
open drainage [1-3]. Some small case series have also advocated
laparoscopic drainage of solitary small liver abscesses [1].

Parenteral antibiotics must be abroad spectrum of anaerobic
coverage and modified to positive cultures and consideration
for unusual organisms such as fungi and protozoans such as
Entamoeba histolytica especially in the immunocompromised and
travelers to endemic regions. Complete clinical and radiographic
resolution is expected to three weeks of bacterial-specific par-
enteral antibiotics. Successful parenteral antibiotic management
alone has been described in patients with abscesses smaller than
3cm in diameter; such patients will probably benefit from a sub-
sequent course of oral antibiotic coverage following conclusion
of 3 weeks of parenteral antibiotics [1-4].

Conclusion
Management modality of multiple complex hepatic abscesses
secondarily to a ruptured gallbladder empyema is dependent on
factors such as the patient’s ability to tolerate surgery, the avail-
ability of radiology - guided drainage and abscess characteristics
such as size and wall thickness. Open surgical drainage should
be first line for low surgical risk patients followed by repeat
sonogram or CT imaging 24- 48 hours after surgical drainage
to evaluate abscess resolution and need for adjunctive interven-
tional catheter drainage.

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Competing Interests
The authors declare no conflict of interest.

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