



Liver Abscess Management in a Complex Oncologic Case

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Abstract

Liver abscesses pose a significant clinical challenge, particularly when complicated by underlying conditions such as cholangiocarcinoma. This case report describes the management of a complex, multiloculated liver abscess in a 50-year-old patient with a multifaceted medical history.

A 50-year-old female with a history of cholangiocarcinoma and associated complications presented with progressive odynophagia and chest pain amidst a backdrop of multiple comorbidities, including diabetes mellitus, gastrointestinal disorders, and a complex surgical history. On admission, she exhibited tachycardia, hypertension, and laboratory findings indicative of microcytic anemia, electrolyte imbalances, and potential systemic hypoperfusion. Imaging did not reveal acute cardiopulmonary issues. Treatment for *E. coli* bacteremia and suspected liver abscess included antibiotics and percutaneous drainage with substantial purulent discharge. The patient's care was further complicated by oral thrush and esophagitis managed successfully with antifungals. Palliative care was consulted. On day 34, the patient was discharged to home hospice.

This case supports the use of percutaneous drainage as a frontline treatment for multiloculated liver abscesses and underscores the need for individualized treatment approaches. It also emphasizes the role of interventional radiology in managing complex intra-abdominal infections.

Keywords

Multiloculated Liver Abscess, Cholangiocarcinoma, Interventional Radiology

Introduction

Liver abscesses present a significant clinical challenge, often leading to serious health consequences. The incidence of liver abscesses has changed over time, influenced by factors such as regional medical practices, the prevalence of underlying medical conditions, and advancements in healthcare systems [1]. While liver abscesses are relatively uncommon in the broader population, there has been an increase in occurrences among individuals at greater risk. Those at higher risk of developing liver abscesses include individuals with compromised

immune systems, chronic alcohol use, diabetes, liver cirrhosis, retroviral disease, neutropenia, and advanced age. Other risk factors may include biliary tract disorders and liver injury. These factors can contribute to the development of liver abscesses and increase the susceptibility of individuals to this condition [2].

Liver abscesses, from a pathological standpoint, can be classified into pyogenic, amebic, or fungal types. Pyogenic abscesses, which are the most common in clinical practice, often originate from bacterial

infections associated with the biliary system, portal vein, or hepatic artery. The causative bacteria can include a range of aerobic and anaerobic species such as *Escherichia coli*, *Klebsiella pneumoniae*, *Streptococcus* species, *Staphylococcus aureus*, and anaerobes like *Bacteroides*. In addition to these bacterial agents, certain conditions like diabetes mellitus and immunosuppression can predispose individuals to the development of liver abscesses. The pathogenesis is multifaceted, encompassing bacterial invasion, the body's immune response, and the influence of any underlying hepatic conditions [3,4].

When diagnosing liver abscesses, a wide range of potential causes must be considered. This includes various infectious and non-infectious conditions such as hepatic neoplasms, both primary and secondary, liver cysts of different complexities, and vascular anomalies within the liver. Liver conditions can range from benign cysts to complex neoplasms. Primary hepatic neoplasms, such as hepatocellular carcinoma, originate within the liver, often linked to underlying liver diseases. Secondary neoplasms, or metastases, are cancers that have spread to the liver from other organs [4]. Liver cysts vary from simple, asymptomatic fluid-filled sacs to complex cysts that may be infectious or have malignant potential [4]. Vascular anomalies include benign hemangiomas and arteriovenous malformations, which are abnormal connections between blood vessels [5]. Conditions not related to the liver that present with similar symptoms, like subphrenic abscesses or thoracic ailments, should also be ruled out [6].

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Grasping the subtleties associated with liver

abscesses is crucial for prompt and effective diagnosis and treatment, both of which are vital for improving patient prognosis. The purpose of this case report is to shed light on the symptomatic expression, diagnostic processes, and treatment methodologies for a hepatic abscess, thereby enriching the existing knowledge base concerning this intricate medical issue.

Case Presentation

A 50-year-old female with a past medical history of cholangiocarcinoma with a CBD stent (diagnosed in 2022) presented with progressive odynophagia and chest pain superimposed on a complex medical history. The patient also faces housing insecurity and recently experienced intractable abdominal pain due to a rapidly enlarging liver lesion suspected of being metastatic cholangiocarcinoma. During her last hospitalization, she considered chemotherapy but was deemed unsuitable due to poor functional status. She declined hospice care, opting for discharge to her residence with a focus on spiritual beliefs.

Her other significant past health issues include anxiety, bilateral tinnitus, biliary and common bile duct strictures, chronic GERD managed with Protonix and Maalox, untreated depression, diabetes mellitus (IDDM), dyspepsia, gastritis, *H. pylori* infection resistant to triple therapy necessitating quadruple therapy, median arcuate ligament syndrome, menopause, new daily persistent headache, and peptic ulcer disease. Her surgical history is notable for multiple interventions including a diagnostic laparoscopy with celiac artery decompression and median arcuate ligament transection, a colonoscopy, ERCP with sphincterotomy and stent placements, and an upper GI endoscopy for GERD with esophagitis.

Current medications include ertapenem, fluconazole, insulin lispro, lidocaine viscous, melatonin, nystatin, potassium chloride, senna, and sodium chloride. She reports allergies to aspirin, bismuth subsalicylate, ibuprofen, and vitamin C. Her immunizations are current, including annual influenza vaccines, a complete Pfizer SARS-CoV-2 vaccination series, pneumococcal polysaccharide vaccine, and Tdap vaccine.

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Socially, she has no history of smoking, alcohol or drug use. Family history is with no history of Cancer.

On admission to the emergency department on January 23, 2024, the patient presented with tachycardia and hypertension. The physical examination found her to be alert and cooperative, with no signs of acute distress. Laboratory results were significant, revealing microcytic anemia with a hemoglobin level of 7.8 g/dL and a mean corpuscular volume (MCV) of 77.5 fL. Electrolyte imbalances were noted, including hyponatremia with a sodium level of 135 mmol/L and hypokalemia with a potassium level of 3.2 mmol/L. Hemoglobin A1c is elevated at 10.8%. Additionally, an elevated alkaline phosphatase level, lactate at 6.1mmol/L, and an iron panel showing elevated ferritin at 700 ng/mL, normal serum iron, low transferrin at 87 mg/dL, and low albumin at 2.6 g/dL were observed. The international normalized ratio (INR) is 1.5. CT scan of the abdomen done 10 days prior to this admission showed multilocular and thick-walled cystic lesions occupying most of the right liver



Fig-1:

CT of the abdomen with contrast 10 days before this admission showed multilocular and thick-walled cystic lesions occupying most of the right liver lobe. The largest cystic component has increased in size now measuring 7.5 cm in maximum dimension (axial 34), previously it measured up to 6.4 cm. A common bile duct stent is seen with a small amount of pneumobilia. A moderate amount of stool is seen in the colon and rectum.

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During her hospital course, she was diagnosed with *E. coli* bacteremia and treated according to the sepsis protocol initially cefepime with a transition to ertapenem after culture sensitivities were available. The infectious disease team considered the possibility of a liver abscess, taking into account the patient's history of an evolving liver cyst from a previous hospitalization, as well as the current imaging findings and presentation of bacteremia. Interventional radiology placed a drain in the lesion with significant purulent output. Follow-up CT on day 20 of admission showed improvement of the cystic mass / abscess (**Fig-2**).



Fig-2:

CT scan on hospital day 20 shows a notable reduction in the size of multifocal fluid collections from 7.5 cm to 4.67 cm within the right lobe of the liver, leaving only trace amounts of residual fluid. The extrahepatic common bile duct stent is visualized extending into the duodenum. There is a decreased presence of intrahepatic ductal dilatation and pneumobilia compared to previous imaging.

Concurrently, she developed oral thrush and esophagitis for which she received an antifungal regimen with noted improvement in oral intake.

Cardiac monitoring showed no Qtc prolongation after fluconazole initiation.

Given the severity of her condition, palliative care was consulted. She requested to change her code status to do not resuscitate (DNR) and the goal of care changed to comfort care. Patient was discharged to home hospice on hospital day 34 with the drain removed.

Discussion

The management of liver abscesses requires a multidisciplinary approach that addresses both the causative factors and the abscess itself. Treatment typically involves antimicrobial therapy, percutaneous drainage, and in some cases, surgical intervention.

Antimicrobial therapy is the cornerstone of treatment for liver abscesses. Broad-spectrum antibiotics are initiated empirically and later tailored based on culture sensitivities [8]. In our case, the patient was started on ertapenem following the identification of *E. coli* bacteremia.

Percutaneous Drainage is the initial management of liver abscesses, especially those exceeding 5 cm or resistant to antibiotics, percutaneous drainage is now the treatment of choice [9]. This technique is less invasive than surgical options and brings multiple benefits such as diminished morbidity for the patient, reduced lengths of hospital stay, and overall decreased costs for the healthcare system [9].

Recent studies have shown that over 90% of patients with single-chambered abscesses experience successful outcomes following drainage assisted by ultrasound or CT [9]. Although success rates for complex, multi-chambered abscesses are modestly lower, they are still preferable to surgical outcomes. In the case presented, the patient with a complex abscess in the liver's right inferior lobe saw significant recovery post CT-guided drainage, confirmed by reduced abscess dimensions in follow-up scans.

The efficacy of percutaneous drainage relies on the skill of the interventional radiology team and the specific features of the abscess. Septations within an

abscess may pose challenges, but with new catheter designs, notably those with multiple side holes, drainage efficiency has been enhanced, even in intricate cases [10]. The use of such a catheter in our patient's procedure facilitated effective management of the septated abscess.

A recent meta-analysis (2024) demonstrated that percutaneous drainage is not only as effective as surgical drainage but may also offer advantages, including reduced post-procedure complications and faster recovery times. It is important to acknowledge, however, that should percutaneous techniques prove unsuccessful or a patient's condition deteriorates, surgical intervention serves as an alternative strategy [11].

The choice between percutaneous drainage and surgical drainage involves considering patient-specific factors, including the size and location of the abscess, the presence of septations, and the patient's overall condition. Percutaneous drainage is less invasive and is associated with lower morbidity compared to surgery, but it may be less effective for multiloculated or thick-walled abscesses [12]. Surgical drainage may be reserved for cases where percutaneous drainage is unsuccessful or not feasible [10].

The prognosis for patients with liver abscesses has improved with advances in diagnostic imaging and interventional techniques. The majority of patients respond well to combined antibiotic and percutaneous drainage treatment, with a low rate of recurrence [13].

Potential complications include superinfection of the abscess, rupture into the peritoneal cavity or adjacent organs, and sepsis. Long-term follow-up is necessary to monitor for these complications [14].

Conclusion

This case report highlights the intricate challenges of treating a multiloculated liver abscess within a patient's broader complex health context, including underlying cholangiocarcinoma. The successful employment of percutaneous drainage stands out as a primary treatment modality, offering an effective, minimally invasive alternative to traditional surgical

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methods. This strategy, along with targeted antibiotic therapy, led to marked clinical improvements and a significant reduction in the size of the abscess, verified through follow-up imaging.

The interventional radiology team's expertise was crucial to the favorable outcome, proving that percutaneous techniques can be effectively utilized in managing complex abscesses with septations. The evaluation of different treatment options further confirms the advantages of percutaneous drainage, particularly its association with reduced morbidity and faster patient recovery.

Personalizing treatment plans is essential in the management of liver abscesses, ensuring that decisions are informed by a comprehensive assessment of risks and benefits tailored to the patient's clinical condition and preferences. This approach aligns with a patient-centric model of care that accommodates individual health goals and considerations.

The insights from this case enhance the body of evidence supporting percutaneous drainage as a preferred option for liver abscess management. It is imperative that research continues to focus on long-term outcomes and the integration of advanced interventional radiology techniques to improve care standards.

Vigilance for potential complications and a structured follow-up process are critical in managing liver abscesses. This case emphasizes the need for a collaborative, multidisciplinary strategy, immediate intervention, and consistent evaluation to achieve the best outcomes for patients with complex intra-abdominal infections.

Conflict of Interest

The authors have read and approved the final version of the manuscript. The authors have no conflicts of interest to declare.

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