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Pyogenic Liver Abscess Secondary to Appendicitis

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Abstract: **Case Report**

Liver abscess is a rare disease, primarily affecting men around 60 years old with multiple comorbidities, notably diabetes, liver transplantation, and digestive neoplasia. Contamination of the liver parenchyma can occur via the biliary tract or hematogenous route (arterial or portal), or directly by contiguity. It is a bacterial, parasitic, or very rarely fungal infection. Liver abscesses of biliary or portal origin are often polymicrobial. Liver abscesses of systemic origin are generally monomicrobial, while fungal liver abscesses are rarer and affect immunocompromised patients. Treatment is based on drainage of the liver abscess, prolonged antibiotic therapy, and treatment of the entry point. We report here the case of a 55-year-old woman presenting a pyogenic liver abscess, secondary to radiologically confirmed acute appendicitis. The objective of this article is to describe a rare cause of liver abscess and review the literature, to contribute to the diagnosis and management of future similar cases.

Keywords: Liver Abscess, Acute Appendicitis, Image-Guided Drainage, Antibiotic Therapy.

INTRODUCTION

A hepatic abscess can be defined as a suppurative cavity related to the invasion and multiplication of microorganisms at the expense of healthy or pathological liver tissue. Hepatic abscesses can be caused by bacteria, parasites, or more rarely fungi, and contamination of the liver parenchyma can occur via the biliary tract, hematogenously (most often portal), or by contiguity [1]. It is a rare condition but its incidence has been increasing for several years and generally affects men around 60 years old [2, 3]. We report the case of a 55-year-old woman presenting a pyogenic hepatic abscess secondary to acute appendicitis.

Case Report

A 55-year-old female patient with insulin-dependent diabetes presented to the emergency department with right hypochondrium abdominal pain evolving over 4 days and progressively worsening. The pain was described as intermittent, exacerbated postprandially, partially relieved by analgesics, and associated with nausea, general condition deterioration including weight loss, fever, chills, and night sweats. The patient was conscious and hemodynamically and respiratory stable. Abdominal examination revealed a soft abdomen with tenderness localized to the right hypochondrium without guarding or rigidity. Murphy's sign was negative. Given this clinical picture, an abdominopelvic CT scan was performed, showing an inter-hepato-diaphragmatic collection with an air-fluid level and air bubbles measuring 125 x 45 x 252 mm, consistent with a liver abscess. Laboratory tests showed leukocytosis at 15,000/mm³ and a C-reactive protein of 250 mg/L. Liver function tests revealed no cytolysis; alkaline phosphatases were twice the upper normal limit and gamma-glutamyl transferases were eight times the upper normal limit. Blood glucose was 3 g/dL, but the patient was not in diabetic ketoacidosis. The patient underwent radiological drainage; the drain immediately evacuated purulent fluid, with bacteriological analysis revealing the presence of Escherichia coli, and was started on triple antibiotic therapy. Due to lack of clinical

improvement and persistent biological inflammatory syndrome after seven days of treatment, a control CT scan was requested. It showed significant reduction of the collection, now measuring 110 x 44 x 163 mm (Figure 1), with a thickened-walled subhepatic appendix. Surgical intervention was indicated. Exploration revealed an inter-hepato-diaphragmatic abscess and a necrotic appendix (Figure 2). An appendectomy was performed with extensive lavage and drainage, and antibiotic therapy was continued. Postoperative course was uncomplicated, and the patient was discharged on postoperative day 10 after clear clinical and biological improvement.

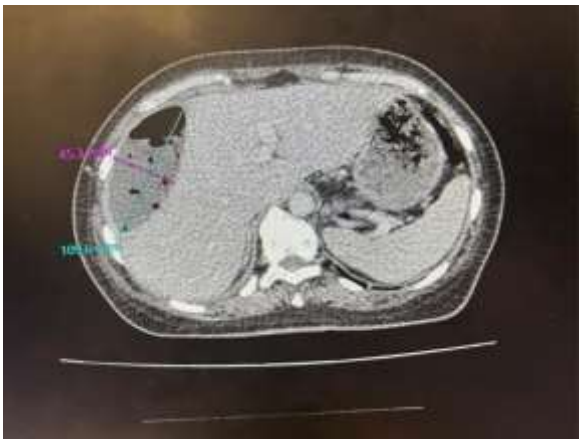

Figure 1: Axial section showing the hepatic abscess

Figure 2: Intraoperative image showing the base of the digested appendix

DISCUSSION

A liver abscess is a purulent collection located within the liver parenchyma [2]. It is a rare disease, but its incidence is increasing in Europe and the United States (1.1 to 3.6 per 100,000 inhabitants), with a median age at diagnosis of 60 years and a male-to-female sex ratio of 2:1 [2, 4]. The most frequent risk factors are diabetes, chronic renal failure, chronic alcoholism, and undergoing invasive medical procedures. It is estimated that 70% of bacterial liver abscesses are related to a preceding infection, while 30% have no identified primary focus [3, 5]. Our patient was younger than the average age of liver abscess occurrence and had only one risk factor, which is diabetes. Liver abscesses can be bacterial, parasitic (mainly amebic), mixed (parasitic secondarily infected by pyogenic bacteria), or more rarely fungal. The frequency of causes varies according to geographical areas. In Southeast Asia and Africa, the amebic origin is the most common. In Western countries, 80% of liver abscesses are bacterial in origin. They may occur during intra-abdominal infections, biliary or non-biliary, via the portal vein (appendicitis, sigmoiditis). Liver abscesses can complicate surgery (duodeno-pancreatectomy or liver transplantation) or hepatobiliary interventional procedures. More rarely, liver abscesses occur after trauma. Some liver abscesses are secondary to extra-abdominal infections that contaminate the parenchyma mostly by hematogenous spread and are most often monomicrobial with positive blood cultures [1, 3]. According to one study, only 1% had a pyogenic abscess secondary to appendicitis. Our patient had an underlying acute appendicitis, diagnosed several days after admission on follow-up imaging given the absence of typical signs and symptoms of appendicitis in this patient. The clinico-biological signs revealing liver abscesses are nonspecific and may include abdominal pain, fever, and biological inflammatory syndrome. Liver function tests may be more or less disturbed depending on the extent of the abscess and its cause (presence of underlying biliary pathology, with cholestasis with or without hyperbilirubinemia, increased transaminases in case of hepatic parenchymal ischemia). Diagnosis relies essentially on imaging studies. Ultrasound and CT scan allow diagnosis in over 90% of cases, as well as orientation toward etiology. The appearance

and evolution of liver abscesses over time are variable, but two phases can be schematically distinguished: a pre-suppurative phase and a suppurative phase. In the pre-suppurative phase, there are heterogeneous, hypodense lesions with irregular, poorly defined contours that can mimic tumor lesions, especially if they are multiple and small. In the suppurative phase, the lesions have hypo- or anechoic content, sometimes multi-loculated. It is at this phase that "target" images can be visualized on ultrasound. After contrast injection, the enhancement is peripheral, taking the form of a hyperdense rim called the "ring sign," while the lesion center does not enhance. Sometimes this rim itself is surrounded by a hypodense ring, creating a "target" appearance. The only nearly pathognomonic sign of a liver abscess is the presence of internal gas lucencies. Imaging must search for biliary pathology, collections, signs of intra-abdominal infections with or without porto-mesenteric septic thrombosis (pylephlebitis). In cases of biliary disease and/or hepatic vein involvement, MRI is useful to complete the assessment. Colonoscopy should be associated with imaging to detect a digestive cause [1, 4, 6]. Management relies on radiological drainage and antibiotic therapy, which must be started urgently after blood cultures are drawn and before drainage to limit the effects of possible systemic bacterial release. We propose empirical antibiotic therapy covering enteric Gram-negative bacilli (E. coli, K. pneumoniae), Streptococcus sp., and anaerobic germs. For example, cefotaxime and metronidazole. Antibiotic therapy must be adapted according to blood culture results and deep pus cultures from the liver abscess [2, 3]. The overall prognosis of patients with pyogenic liver abscess has improved: older studies reported mortality rates of 11% to 31%, whereas recent studies show a rate of 2.5% to 5.6%. The risk of mortality was higher in patients of advanced age and with comorbidities.

CONCLUSION

Pyogenic liver abscesses represent a rare condition that can be secondary to several pathologies, particularly biliary or gastrointestinal. A small number of cases of liver abscess secondary to appendicitis have been reported in the literature. Common manifestations include fever, chills, abdominal pain, leukocytosis, hypoalbuminemia, elevated alkaline phosphatase, as well as variable imaging findings [3]. Treatment is based on percutaneous abscess drainage and broad-spectrum antibiotic therapy until the underlying source of infection is identified [1, 2]. The aim of this case report is to review the literature on this rare clinical picture and to improve the diagnostic criteria of pyogenic liver abscesses by defining this pathology as a possible complication of appendicitis.

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