Computed Tomography finding of Intraabdominal Ruptured Liver Abscess

Huynh Quang Huy 1*, Le Cong Tri 2 and Pham Hong Duc 3

1 Radiology Department, Pham Ngoc Thach University of Medicine and HCMC Oncology Hospital, Vietnam
2 Surgery Department, Cho Ray hospital, Vietnam
3 Diagnostic Imaging Department, Ha Noi University of Medicine

Received date: May 22, 2019; Published date: June 11, 2019

*Corresponding author: Huynh Quang Huy, Radiology Department, Pham Ngoc Thach University of Medicine and HCMC Oncology Hospital, District 10, Ho Chi Minh city, Vietnam

Abstract

Objectives: The purpose of this study is to describe the computed tomography of intra abdominal ruptured liver abscess.

Patients and Methods: The computed tomography findings of 32 patients who had a confirmed intraabdominal ruptured liver abscess were analyzed retrospectively at Cho Ray hospital between 2014 and 2018.

Results: 32 patients with a median age of 53.3 ± 15.3 years (range, 24–85 years). There were more men than women in the study, with a male-to-female ratio of 1.9:1. Most of the patients were suffering from abdominal pain (96.9%), malaise and anorexia (96.9%), fever (78.1%), peritonitis (78.1%). The mean size of the liver abscess was 8.4 cm (range, 4.0–14 cm). A single abscess was found in 11 patients, and multiple abscesses were seen in 21 patients. Unilobar involvement was seen in 29 patients, with the right lobe affected more commonly (68.8%, 22 of 32). The abscesses were completely liquefied in 25 patients and gas in the abscess cavity in 7 patients. Free intraperitoneal fluid was seen in all patients.

Conclusion: A knowledge of intraabdominal ruptured liver abscess is important for an early diagnosis and appropriate management.

Keywords: Liver; Abscess; Ruptured; Computed Tomography; Clinical

Introduction

Liver abscess is a common condition in tropical countries and is associated with significant morbidity and mortality. Traditionally, there are two major classifications of hepatic abscess; pyogenic and amoebic [1, 2]. There are various complications associated with hepatic abscesses, of which, rupture of the abscess is the most common [3-5]. Intraperitoneal rupture of liver abscess is a rare but potentially fatal disease, often involving the elderly, who are commonly of poor surgical risk with background of significant medical illness [6,7]. Accurate preoperative diagnosis is difficult and often necessitates exploratory laparotomy for peritonitis [8].

Computed tomography (CT) is an ideal tool for diagnosing hepatic abscesses, and the sensitivity of CT for detecting hepatic abscesses is as high as 97% [9]. On CT, an hepatic abscess appears as a single or multiloculated mass with low attenuation [9]. Early diagnosis and prompt therapy are essential to reduce the morbidity and mortality associated with a pyogenic hepatic abscess. The mortality rate is low when the abscess is confined to the liver; however, the mortality rate is increased when the hepatic abscess extends into the chest, peritoneal cavity, or pericardial cavity [10]. Therefore, the early detection of complications associated with hepatic abscesses is important. In hepatic abscess, various complications have been described [11-13], and the rate of complications was reported to be 10.3% [10]. Reports of complications in pyogenic hepatic abscess are rare, however, and the imaging appearance has been studied in only a small number of patients [13,14]. This article presents the CT and clinical findings of our patients with intraabdominal ruptured liver abscess.

Patients and Methods

This is a retrospective observational study of patients with intraabdominal ruptured liver abscess presenting to Cho Ray hospital between 2014 and 2018. The study was approved by the Hospital Ethical Board. All diagnosed cases of ruptured liver abscess based on radiology and laparoscopic investigation were included in the study. Details of demographics (age, sex), clinical features, computed tomography were recorded. Data will be analyzed using SPSS software.
All patients underwent contrast enhanced CT of the liver before laparoscopic drainage of the liver abscess. In some patients, CT studies were also performed during follow-up to assess the size of the abscess cavity, monitor complications. However, we only reviewed the contrast-enhanced CT images obtained before drainage of the liver abscess, for the purpose of this study. The CT examinations were performed using Somatom Sensation 64, Siemens, Germany. The scanning parameters varied during the study period and with different scanners: collimation ranged from 1.25 mm to 7 mm; pitch ranged from 0.75 to 1.5; section thickness ranged from 1 mm to 5 mm. Liver examinations were conducted using 100 ml of intravenous non-ionic iodinated contrast medium (Ultravist, Schering, Berlin, Germany) and dosage was calculated based on the patients’ weight and administered via a power injector at a rate of 3 mL/sec. Axial sections of 3-5 mm thickness were reconstructed, reported, and archived.

The scans were reviewed by two radiologists who reached agreement between them. The following features were recorded: (a) lobe involvement (unilobar [right or left] or bilobar); (b) number of abscesses (single or multiple); (c) maximal abscess diameter, with the largest abscess measured when there were multiple abscesses; (d) unilocular or multilocular (presence of ≥1-mm-thick septations), multilocular abscess; (e) solid or cystic appearance (>50% of the abscess cavity appears hypodense or liquefied, with an attenuation value of ≤20 HU) in most of the sections showing the abscess cavity, cystic abscess; (f) gas within the abscess cavity; and (g) spontaneous rupture of the abscess (based on CT and clinical symptoms).

**Results**

The study group consisted of 32 patients with a median age of 53.3 ± 15.3 years (range, 24–85 years). There were more men than women in the study, with a male-to-female ratio of 1.9:1. Most of the patients were suffering from abdominal pain (96.9%), malaise and anorexia (96.9%), fever (78.1%), peritonitis (78.1%), and other positive clinical signs showed in Table 1.

**Table 1:** Clinical presentations of intraabdominal ruptured liver absces.

<table>
<thead>
<tr>
<th>Clinical Presentations</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal pain</td>
<td>31</td>
<td>96.9</td>
</tr>
<tr>
<td>Malaise and anorexia</td>
<td>31</td>
<td>96.9</td>
</tr>
<tr>
<td>Nausea / vomiting</td>
<td>20</td>
<td>62.5</td>
</tr>
<tr>
<td>Fever &gt; 38°C</td>
<td>25</td>
<td>78.1</td>
</tr>
<tr>
<td>Jaundice</td>
<td>5</td>
<td>15.6</td>
</tr>
<tr>
<td>Peritonitis</td>
<td>25</td>
<td>78.1</td>
</tr>
<tr>
<td>Hepatomegaly</td>
<td>4</td>
<td>12.5</td>
</tr>
</tbody>
</table>

The mean time interval between the onset of fever and CT was 8.3 days (range, 1–30 days). The mean size of the liver abscess was 8.4 cm (range, 4.0–14 cm). A single abscess was found in 11 patients, and multiple abscesses were seen in 21 patients. Unilobar involvement was seen in 29 patients, with the right lobe affected more commonly (68.8%, 22 of 32). The abscesses were completely liquefied in 25 patients and gas in the abscess cavity in 7 patients. Free intraperitoneal fluid was seen in all patients. The liver CT characteristics of intraabdominal ruptured liver abscess was showed in Table 2, Figures 1 & 2.

**Table 2:** CT characteristics of intraabdominal ruptured liver absces.

<table>
<thead>
<tr>
<th>CT Findings</th>
<th>All Patients (n=32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscess size (cm)</td>
<td>8.4 (4.0–14)</td>
</tr>
<tr>
<td>No. of abscesses</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>11 (34.4)</td>
</tr>
<tr>
<td>&gt;1</td>
<td>21 (65.6)</td>
</tr>
<tr>
<td>Lobar involvement</td>
<td></td>
</tr>
<tr>
<td>Unilobar</td>
<td>29 (90.6)</td>
</tr>
<tr>
<td>Bilobar</td>
<td>3 (9.4)</td>
</tr>
<tr>
<td>Abscess appearance</td>
<td></td>
</tr>
<tr>
<td>Completely liquefied</td>
<td>25 (78.1%)</td>
</tr>
<tr>
<td>Gas in the abscess cavity</td>
<td>7 (21.9)</td>
</tr>
<tr>
<td>Peritoneal effusion</td>
<td>32 (100%)</td>
</tr>
</tbody>
</table>

**Figure 1:** A 71-year-old woman with rupture of a pyogenic hepatic abscess into the peritoneal cavity resulting in peritonitis. The abscess is located in the right hepatic lobe with gas inside.

**Figure 2:** A 62-year-old man rupture of a pyogenic hepatic abscess forming a perihepatic abscess. An enhanced helical computed tomography scan shows a heterogeneously hypodense abscess in the left hepatic lobe.
How to cite this article: Huynh Quang Huy, Le Cong Tri, Pham Hong Duc. Computed Tomography finding of Intraabdominal Ruptured Liver Abscess. Current Trends in Clinical & Medical Imaging. 2019; 3(2): 555610. DOI: 10.19080/CTCMI.2019.03.555610

Discussion

Liver abscess is an important tropical gastrointestinal disorder [15,16]. Liver abscess can be classified into pyogenic and amebic, both having its serious implications, especially when presented late. In developing countries, it forms a major cause for mortality and morbidity [17,18]. With the advent of modern radiological modalities, diagnosis of hepatic abscess is possible in early stages resulting in nonsurgical management; however, fraction of patients either due to late presentation or refractory disease presents with ruptured liver abscess thereby increasing the mortality, presents with fatal disease course, and requires surgical intervention at the earliest [8,19].

Intraperitoneal rupture is one of the serious complication of liver abscesses [5-21]. The frequency of intraperitoneal rupture of an liver abscess varies from 2.5% to 17% [22]. Clinically, increasing hepatic tenderness should indicate an impending rupture [22]. Computed tomography may provide important information regarding the extent of intraperitoneal spread of the liver abscess. Dal Mo Yang et al. [23] study 81 patients who had a confirmed pyogenic hepatic abscess, the complication was encountered in 3 patients (3.7%), and 2 types could be recognized: a loculated perihemat abscess (n = 2) and diffuse peritonitis (n = 1). In diffuse peritonitis secondary to rupture of a hepatic abscess, a large amount of ascites and diffuse thickening of the parietal peritoneum could be seen on CT. Although an amebic peritonitis secondary to rupture of a hepatic amebic abscess showed a poor survival rate despite surgical intervention, all the patients with intraperitoneal rupture of the pyogenic hepatic abscess could be treated with percutaneous drainage and antibiotic treatment.

The most common presentation was abdominal pain (96.9%), malaise and anorexia (96.9%), fever (78.1%), peritonitis (78.1%), nausea/vomiting (62.5%), jaundice and hepatomegaly (15.6% and 12.5%, respectively). This results were comparable to study by Hind S. Alsaf et with the most common presentation was abdominal pain (96.9%), fever (78.1%), jaundice and hepatomegaly (15.6% and 12.5%, respectively). Results were comparable to study by Hind S. Alsaf with the most common presentation was abdominal pain (96.9%), malaise and anorexia (96.9%), fever (78.1%), peritonitis (78.1%), nausea/vomiting (62.5%), jaundice and hepatomegaly (15.6% and 12.5%, respectively). In diffuse peritonitis secondary to rupture of a hepatic abscess, a large amount of ascites and diffuse thickening of the parietal peritoneum could be seen on CT. Although an amebic peritonitis secondary to rupture of a hepatic amebic abscess showed a poor survival rate despite surgical intervention, all the patients with intraperitoneal rupture of the pyogenic hepatic abscess could be treated with percutaneous drainage and antibiotic treatment.

Liver abscess is an important tropical gastrointestinal disorder [15,16]. Liver abscess can be classified into pyogenic and amebic, both having its serious implications, especially when presented late. In developing countries, it forms a major cause for mortality and morbidity [17,18]. With the advent of modern radiological modalities, diagnosis of hepatic abscess is possible in early stages resulting in nonsurgical management; however, fraction of patients either due to late presentation or refractory disease presents with ruptured liver abscess thereby increasing the mortality, presents with fatal disease course, and requires surgical intervention at the earliest [8,19].

Intraperitoneal rupture is one of the serious complication of liver abscesses [5-21]. The frequency of intraperitoneal rupture of an liver abscess varies from 2.5% to 17% [22]. Clinically, increasing hepatic tenderness should indicate an impending rupture [22]. Computed tomography may provide important information regarding the extent of intraperitoneal spread of the liver abscess. Dal Mo Yang et al. [23] study 81 patients who had a confirmed pyogenic hepatic abscess, the complication was encountered in 3 patients (3.7%), and 2 types could be recognized: a loculated perihemat abscess (n = 2) and diffuse peritonitis (n = 1). In diffuse peritonitis secondary to rupture of a hepatic abscess, a large amount of ascites and diffuse thickening of the parietal peritoneum could be seen on CT. Although an amebic peritonitis secondary to rupture of a hepatic amebic abscess showed a poor survival rate despite surgical intervention, all the patients with intraperitoneal rupture of the pyogenic hepatic abscess could be treated with percutaneous drainage and antibiotic treatment.

The most common presentation was abdominal pain (96.9%), malaise and anorexia (96.9%), fever (78.1%), peritonitis (78.1%), nausea/vomiting (62.5%), jaundice and hepatomegaly (15.6% and 12.5%, respectively). This results were comparable to study by Hind S. Alsaf with the most common presentation was abdominal pain (96.9%), fever (78.1%), jaundice and hepatomegaly (15.6% and 12.5%, respectively). In diffuse peritonitis secondary to rupture of a hepatic abscess, a large amount of ascites and diffuse thickening of the parietal peritoneum could be seen on CT. Although an amebic peritonitis secondary to rupture of a hepatic amebic abscess showed a poor survival rate despite surgical intervention, all the patients with intraperitoneal rupture of the pyogenic hepatic abscess could be treated with percutaneous drainage and antibiotic treatment.

Liver abscess is an important tropical gastrointestinal disorder [15,16]. Liver abscess can be classified into pyogenic and amebic, both having its serious implications, especially when presented late. In developing countries, it forms a major cause for mortality and morbidity [17,18]. With the advent of modern radiological modalities, diagnosis of hepatic abscess is possible in early stages resulting in nonsurgical management; however, fraction of patients either due to late presentation or refractory disease presents with ruptured liver abscess thereby increasing the mortality, presents with fatal disease course, and requires surgical intervention at the earliest [8,19].

Intraperitoneal rupture is one of the serious complication of liver abscesses [5-21]. The frequency of intraperitoneal rupture of an liver abscess varies from 2.5% to 17% [22]. Clinically, increasing hepatic tenderness should indicate an impending rupture [22]. Computed tomography may provide important information regarding the extent of intraperitoneal spread of the liver abscess. Dal Mo Yang et al. [23] study 81 patients who had a confirmed pyogenic hepatic abscess, the complication was encountered in 3 patients (3.7%), and 2 types could be recognized: a loculated perihemat abscess (n = 2) and diffuse peritonitis (n = 1). In diffuse peritonitis secondary to rupture of a hepatic abscess, a large amount of ascites and diffuse thickening of the parietal peritoneum could be seen on CT. Although an amebic peritonitis secondary to rupture of a hepatic amebic abscess showed a poor survival rate despite surgical intervention, all the patients with intraperitoneal rupture of the pyogenic hepatic abscess could be treated with percutaneous drainage and antibiotic treatment.

The most common presentation was abdominal pain (96.9%), malaise and anorexia (96.9%), fever (78.1%), peritonitis (78.1%), nausea/vomiting (62.5%), jaundice and hepatomegaly (15.6% and 12.5%, respectively). This results were comparable to study by Hind S. Alsaf with the most common presentation was abdominal pain (96.9%), fever (78.1%), jaundice and hepatomegaly (15.6% and 12.5%, respectively). In diffuse peritonitis secondary to rupture of a hepatic abscess, a large amount of ascites and diffuse thickening of the parietal peritoneum could be seen on CT. Although an amebic peritonitis secondary to rupture of a hepatic amebic abscess showed a poor survival rate despite surgical intervention, all the patients with intraperitoneal rupture of the pyogenic hepatic abscess could be treated with percutaneous drainage and antibiotic treatment.

Liver abscess is an important tropical gastrointestinal disorder [15,16]. Liver abscess can be classified into pyogenic and amebic, both having its serious implications, especially when presented late. In developing countries, it forms a major cause for mortality and morbidity [17,18]. With the advent of modern radiological modalities, diagnosis of hepatic abscess is possible in early stages resulting in nonsurgical management; however, fraction of patients either due to late presentation or refractory disease presents with ruptured liver abscess thereby increasing the mortality, presents with fatal disease course, and requires surgical intervention at the earliest [8,19].

Intraperitoneal rupture is one of the serious complication of liver abscesses [5-21]. The frequency of intraperitoneal rupture of an liver abscess varies from 2.5% to 17% [22]. Clinically, increasing hepatic tenderness should indicate an impending rupture [22]. Computed tomography may provide important information regarding the extent of intraperitoneal spread of the liver abscess. Dal Mo Yang et al. [23] study 81 patients who had a confirmed pyogenic hepatic abscess, the complication was encountered in 3 patients (3.7%), and 2 types could be recognized: a loculated perihemat abscess (n = 2) and diffuse peritonitis (n = 1). In diffuse peritonitis secondary to rupture of a hepatic abscess, a large amount of ascites and diffuse thickening of the parietal peritoneum could be seen on CT. Although an amebic peritonitis secondary to rupture of a hepatic amebic abscess showed a poor survival rate despite surgical intervention, all the patients with intraperitoneal rupture of the pyogenic hepatic abscess could be treated with percutaneous drainage and antibiotic treatment.

The most common presentation was abdominal pain (96.9%), malaise and anorexia (96.9%), fever (78.1%), peritonitis (78.1%), nausea/vomiting (62.5%), jaundice and hepatomegaly (15.6% and 12.5%, respectively). This results were comparable to study by Hind S. Alsaf with the most common presentation was abdominal pain (96.9%), fever (78.1%), jaundice and hepatomegaly (15.6% and 12.5%, respectively). In diffuse peritonitis secondary to rupture of a hepatic abscess, a large amount of ascites and diffuse thickening of the parietal peritoneum could be seen on CT. Although an amebic peritonitis secondary to rupture of a hepatic amebic abscess showed a poor survival rate despite surgical intervention, all the patients with intraperitoneal rupture of the pyogenic hepatic abscess could be treated with percutaneous drainage and antibiotic treatment.
Conclusion

A ruptured hepatic abscess is more life-threatening than an unruptured one. A rapid and accurate diagnosis and prompt surgical intervention are essential. Computed tomography is an ideal tool for diagnosing hepatic abscesses and its complications. The authors are grateful to physicians, administrative staff at Cho Ray Hospitals for allowing us to undertake this research.

References
