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Liver abscess and tracheal fistula induced by transcatheter arterial chemoembolization for hepatocellular carcinoma: A case report

Fu-Long Zhang, Jing Xu, Yu-Hong Jiang, Yuan-Dong Zhu, Qian-Neng Wu, Yan Shi, Fang-Yuan Zhu, Jing-Wen Chen, Liang-Xiao Wu

**Abstract**

**BACKGROUND**

Transarterial chemoembolization (TACE) is a standard treatment for intermediate-stage hepatocellular carcinoma (HCC). The complications of TACE include biliary tract infection, liver dysfunction, tumor lysis syndrome, biloma, partial intestinal obstruction, cerebral lipiodol embolism, etc. There are few reports about tracheal fistula induced by TACE.

**CASE SUMMARY**

A 42-year-old man came to our hospital with cough and expectoration for 1 month after TACE for HCC. Laboratory test results showed abnormalities of albumin, hemoglobin, prothrombin time, C-reactive protein, D-dimer, and prothrombin. Culture of both phlegm and liver pus revealed growth of *Citrobacter flavescens*. Computed tomography showed infection in the inferior lobe of the right lung and a low-density lesion with gas in the right liver. Liver ultrasound showed that there was a big hypoechogenic liquid lesion without blood flow signal. Drainage for liver abscess by needle puncture under ultrasonic guidance was performed. After 1 month of drainage and anti-infection therapy, the abscess in the liver and the infection in the lung were reduced obviously, and the symptom of expectoration was relieved.

**CONCLUSION**

Clinicians should be alert to the possibility of complications of liver abscess and tracheal fistula after TACE for HCC. Drainage for liver abscess by needle puncture under ultrasonic guidance could relieve the liver abscess and tracheal fistula.
Key Words: Tracheal fistula; Liver abscess; Transcatheter arterial chemoembolization; Hepatocellular carcinoma; Drainage; Case report

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Core Tip: Transarterial chemoembolization (TACE) is commonly used for treating hepatocellular carcinoma (HCC). The complications of TACE include liver rupture, liver abscess, etc. We report a patient treated with TACE for HCC who developed liver abscess and tracheal fistula. Drainage for liver abscess by needle puncture under ultrasonic guiding could relieve the liver abscess.


INTRODUCTION

Hepatocellular carcinoma (HCC) ranks as the world's fifth most prevalent cancer and the third leading cause of cancer-related deaths[1]. Transarterial chemoembolization (TACE) is commonly used for treating intermediate-stage HCC[2]. The complications of TACE include liver rupture, liver abscess, femoral artery pseudoaneurysm, cholecystitis, biloma, pulmonary embolism, cerebral lipiodol embolism, tumor lysis syndrome, partial intestinal obstruction, and gallbladder perforation[3]. TACE has been known to cause tracheal fistula in a few patients treated with this procedure.

CASE PRESENTATION

Chief complaints

A 42-year-old man presented with symptoms of cough and expectoration for 1 month.

History of present illness

The patient did not have any previous pulmonary diseases such as coughing.

History of past illness

TACE was performed for HCC 1 month ago. Two years earlier, the patient suffered from hepatitis B liver cirrhosis and was administered oral entecavir daily for antiviral treatment.

Personal and family history

The patient had no history of high blood pressure, diabetes, or heart disease. His family was free from any cancerous conditions.

Physical examination

Clinical assessments revealed a diseased liver, absence of skin or sclera discoloration, clear respiratory sounds during auscultation of both lungs, no signs of dry or wet rales, a heart rate of 76 beats per minute, consistent heart rhythm, a soft abdomen, absence of tenderness or rebound pain, accessible 1 cm beneath the ribs of the right clavicular line of the liver and spleen, and no swelling in either lower extremity.

Laboratory examinations

The stool and urine tests showed no abnormality. Laboratory test results showed that white blood cell count, platelet count, prothrombin time, total bilirubin, alanine aminotransferase, creatinine, alpha-fetoprotein, carcinoembryonic antigen, carbohydrate antigen 19-9, triglyceride, cholesterol, amylase, lipase, and glucose were all within normal range (Table 1). Albumin, hemoglobin, C-reactive protein, prothrombin, and D-dimer were abnormal (Table 1). Hepatitis B surface antigen was positive. Hepatitis C antibody, human immunodeficiency virus antibody, syphilis antibody, and anti-nuclear antibodies were all negative.

Imaging examinations

Culture of both phlegm and liver pus revealed growth of Citrobacter flavescens. Computed tomography showed infection in the inferior lobe of the right lung (Figure 1A) and a low density lesion with gas in the right liver (Figure 1B). Liver ultrasound showed that there was a big hypoechoic liquid lesion (Figure 1C) without blood flow signal (Figure 1D).
### Table 1 Laboratoy results of the patient

<table>
<thead>
<tr>
<th>Laboratory result</th>
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<tr>
<td>WBC (× 10⁹/L)</td>
<td>3.4-9.5</td>
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<tr>
<td>Hb (g/L)</td>
<td>120-150</td>
</tr>
<tr>
<td>Platelets (× 10⁹/L)</td>
<td>125-350</td>
</tr>
<tr>
<td>PT (s)</td>
<td>9.7-12.6</td>
</tr>
<tr>
<td>D-dimer (mg/L)</td>
<td>0.00-0.55</td>
</tr>
<tr>
<td>ALT (U/L)</td>
<td>9-50</td>
</tr>
<tr>
<td>TB (µmol/L)</td>
<td>3-20</td>
</tr>
<tr>
<td>ALB (g/L)</td>
<td>40.55</td>
</tr>
<tr>
<td>Cr (µmol/L)</td>
<td>40-80</td>
</tr>
<tr>
<td>CA19-9 (kU/L)</td>
<td>0-35</td>
</tr>
<tr>
<td>CEA (µg/L)</td>
<td>0.5</td>
</tr>
<tr>
<td>AFP (µg/L)</td>
<td>0.9</td>
</tr>
<tr>
<td>ABP (mAU/mL)</td>
<td>10-14</td>
</tr>
<tr>
<td>CRP (mg/L)</td>
<td>0-10</td>
</tr>
<tr>
<td>Triglyceride (mmol/L)</td>
<td>0.17</td>
</tr>
<tr>
<td>Cholesterol (mmol/L)</td>
<td>2.86-5.98</td>
</tr>
<tr>
<td>Amylase (U/L)</td>
<td>35-135</td>
</tr>
<tr>
<td>Lipase (U/L)</td>
<td>0-190</td>
</tr>
<tr>
<td>Glucose (mmol/L)</td>
<td>3.0-6.1</td>
</tr>
<tr>
<td>Culture of phlegm</td>
<td><em>Citrobacter flavescens</em></td>
</tr>
<tr>
<td>Culture of liver pus</td>
<td><em>Citrobacter flavescens</em></td>
</tr>
<tr>
<td>HbsAg</td>
<td>Positive</td>
</tr>
<tr>
<td>HIV Ab</td>
<td>Negative</td>
</tr>
<tr>
<td>Sp Ab</td>
<td>Negative</td>
</tr>
<tr>
<td>ANA</td>
<td>Negative</td>
</tr>
<tr>
<td>HC Ab</td>
<td>Negative</td>
</tr>
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WBC: White blood cell count; PT: Prothrombin time; TB: Total bilirubin; ALT: Alanine aminotransferase; Cr: Creatinine; AFP: Alpha-fetoprotein; CEA: Carcinoembryonic antigen; CA19-9: Carbohydrate antigen 19-9; ALB: Albumin; Hb: Hemoglobin; CRP: C-reactive protein; ABF: Abnormal prothrombin; HbsAg: Hepatitis B surface antigen; HC Ab: Hepatitis C antibody; HIV Ab: Human immunodefciency virus antibody; Sp Ab: Syphilis antibody; ANA: Anti-nuclear antibodies.

Drainage for liver abscess by needle puncture under ultrasonic guidance was performed (Figure 1E). After 1 month of drainage and systemic antibiotic treatment, the abscess in the liver (Figure 1F) and the infection in the lung (Figure 1G) were reduced obviously, and the symptom of expectoration was relieved.

### FINAL DIAGNOSIS

Liver abscess and tracheal fistula.

### TREATMENT

Drainage of the liver abscess and systemic antibiotic treatment were performed for 1 month.
Zhang FL et al. Tracheal fistula induced by TACE for HCC

Figure 1 Drainage for liver abscess by needle puncture under ultrasonic guidance relieves the liver abscess and tracheal fistula (pulmonary infection). A: Computed tomography showed infection in the inferior lobe of the right lung; B: Computed tomography showed a low density lesion with gas was in right liver; C: Ultrasound showed that there was a big hypoechoic liquid lesion in the right liver; D: Liver ultrasound showed that the hypoechoic liquid lesion had no blood flow signal; E: Drainage for the liver abscess by needle puncture under ultrasonic guiding was performed; F: Magnetic resonance imaging showed that the abscess in the right liver was reduced obviously; G: Computed tomography showed that the infection in the right lung was relieved obviously.

OUTCOME AND FOLLOW-UP

The abscess in the liver (Figure 1F) and infection in the lung (Figure 1G) were reduced obviously, and the symptom of expectoration was relieved.

DISCUSSION

Multiple complications have been linked to TACE, such as postembolization syndrome, liver failure, liver infarction, liver abscess, biliary necrosis, cholecystitis, skin injuries, and adrenal bleeding[4-6]. Of these complications, liver abscess is known to be able to lead to a severe illness, extended hospital stays, and a high risk of death[7,8]. The occurrence of liver abscesses following liver chemoembolization is uncommon, yet it has been documented in earlier research. Reed et al[9] documented that out of 227 patients, 6 (2.6%) developed liver abscesses post-chemoembolization. Liver abscesses have the potential to burst into the gastrointestinal, pericardial, and peritoneal spaces[10-12]; yet, the occurrence of fistula in the trachea is uncommon, with only a handful of hepatogastric fistula cases documented[13,14]. The combination of percutaneous catheter drainage and systemic antibiotics stands as the predominant method for treating hepatic abscesses [15,16].

In this case, after 1 month of drainage and systemic antibiotic treatment, the abscess in the liver and the infection in the lung were reduced obviously, and the symptom of expectoration was relieved. The reasons for the abscess and tracheal fistula induced by TACE may be as follow: (1) Necrosis and liquefaction of the tumor occur after TACE; (2) the normal cells in the liver were injured and accompanied with inflammatory exudation; (3) the location of TACE was near the diaphragm, and the chemoembolization may injure the diaphragm; and (4) the abscess may gradually invades the diaphragm and trachea.
CONCLUSION

Clinicians should be alert to the possibility of complications of abscess and tracheal fistula after TACE for HCC. Drainage for liver abscess by needle puncture under ultrasonic guidance could relieve the liver abscess and tracheal fistula.

FOOTNOTES

Author contributions: Zhang FL and Zhu YD contributed equally to this work; Zhang FL and Zhu YD designed the research study; Xu J, Jiang YH, Wu QN, Shi Y, Zhu FY, Chen JW, and Wu LX performed the research; Xu J contributed new reagents and analytic tools; Zhang FL and Xu J analyzed the data and wrote the manuscript. All authors have read and approved the final manuscript.

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