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Case Report

Biliary complications after transcatheter arterial chemoembolization for hepatocellular carcinoma

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ABSTRACT

Transarterial chemoembolization (TACE) is considered an effective procedure for liver malignancy. Although the majority of TACE related complications can be treated conservatively, appropriate therapeutic interventions, such as percutaneous/endoscopic drainage or partial hepatectomy, might be needed in cases of signs of severe infection and/or progressive biloma. Therefore, we herein report a case of TACE induced biliary complications which were treated with a multi-disciplinary approach; intrahepatic progressive biloma was treated with percutaneous drainage, intrahepatic bile duct stricture was treated by endoscopic balloon dilation and plastic stent placement.

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Keywords: Drainage; Endoscopy; Intrahepatic bile ducts; Therapeutic chemoembolization

Introduction

Transarterial chemoembolization (TACE) is one of the effective therapeutic options for hepatocellular carcinoma (HCC) and usually performed with relative safety. However, serious complications could be developed, such as acute liver failure, intrahepatic infarction, pulmonary embolism, tumor rupture, variceal bleeding, and celiac artery perforation.¹ Furthermore, biliary complications including biloma and bile duct stricture also might occur with a variable incidence rate, and it could lead to fatal clinical outcome despite aggressive management.² We herein report a case of TACE induced progressive intrahepatic biloma and biliary stricture which were treated with a multi-disciplinary approach.

Case Report

A 68-year-old man was presented to the emergency room (ER) with chief complaints of acute abdominal pain suddenly developed 12 hours ago. He did not complain of fever and chills. He was diagnosed with HCC about five years ago and had been treated with three times of radiofrequency ablation (RFA) therapy

and two times of TACE. About two months ago he suffered from TACE induced extracapsular biloma although it was successfully treated with percutaneous drainage (PCD).

On physical examination, direct epigastric tenderness was identified whereas his vital signs were stable. Initial laboratory tests at ER were as follows: white blood cell count 12,110/mm³ (range, 4.0–10.0/μL), hemoglobin 9.5 g/dL (range, 13.0–17.0 g/dL), hematocrit 30.3% (range, 38%–52%), platelet count 273,000/mm³ (range, 150,000–400,000/mm³), aspartate aminotransferase 738 IU/L (range, 0–40 IU/L), alanine aminotransferase 473 IU/L (range, 0–40 IU/L), alkaline phosphatase 373 IU/L (range, 40–130 IU/L), total bilirubin 1.16 mg/dL (range, 0–1.20 mg/dL), and C-reactive protein 5.5 mg/dL (range, 0–0.5 mg/dL).

Abdominal computed tomography (CT) scanning revealed multiple, variable-sized necrotic masses in right lobe and irregular intrahepatic bile duct dilation in segment 4 of the liver. Furthermore, a 2.6 cm sized biloma with wall-thickness near segment 4 of the liver was identified (Fig. 1). Therefore, systemic antibiotics were started along with two procedures of PCD to treat large sized two intrahepatic bilomas (Fig. 2). Furthermore, magnetic resonance cholangiopancreatography (MRCP) was performed to eval-

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Fig. 1. Abdominal computed tomography showed multiple, variable-sized bilomas in right lobe and irregular intrahepatic bile duct dilation in segment 4.

Fig. 2. Two procedures of percutaneous drainage were performed to treat 2 large-sized intrahepatic bilomas.

uate the biliary tract since intermittent fever had been sustained, and the amount of bile drainage had not been decreased. MRCP showed segmental stricture of the anterior branch of the right hepatic duct (Fig. 3). Therefore, endoscopic balloon dilation for the stricture site was performed with 8 mm balloon, and endoscopic biliary plastic stent (7 Fr, 12 cm) was placed for the maintenance of biliary dilation (Fig. 4). After the endoscopic and interventional radiologic treatment along with systemic antibiotics treatment, follow-up CT showed the improved state of multiple bilomas and clinical symptoms was also improved. Follow-up cholangiography via the PCD tract was performed to remove the previously inserted PCD catheter. Nonetheless, cholangiography showed bile duct communication with intrahepatic biloma (Fig. 5). Therefore, we decided the internal plastic stent to be continuously placed to drain the intrahepatic biloma, whereas the 2 PCDs were successfully removed. Finally, the patient could be discharged after the PCD removal while internal plastic stent was maintained.

Discussion

Since the concept of arterial embolization with a chemotherapeutic agent was introduced by Doyon et al³ in 1974 and

Fig. 3. Magnetic resonance cholangiopancreatography showed segmental stricture of the anterior branch of the right hepatic duct (arrow).

Fig. 4. (A) Endoscopic retrograde cholangiography (ERC) showed intrahepatic biliary segmental stricture of anterior branch of right hepatic duct. (B) Endoscopic balloon dilation for the stricture site was performed with 8 mm balloon. (C) ERC showed improved state of previous biliary stricture. (D) Endoscopic biliary plastic stent (7 Fr, 12 cm) was placed for the maintenance of biliary dilation.

Fig. 5. Follow-up cholangiography via the percutaneous drainage tract showed bile duct communication with intrahepatic biloma.

Yamada et al.^{4,5} in 1983, TACE has gained popularity worldwide. The liver is a unique organ because it receives dual blood supplies with about 75% from the portal vein and 25% from the hepatic artery. However, most liver tumors regardless of the tumor origin (primary and metastatic neoplasm), receive almost of their blood flow through the hepatic artery.⁶ Therefore, ischemic necrosis and membrane damage caused by transarterial embolization leads to increase absorption of the anticancer drug.⁷ It is one of the reasons for the effectiveness of TACE for hypervascular tumors, thereby widely used for HCC and hepatic metastases from colorectal and neuroendocrine tumor.^{8,9} Conversely, the conditions of reduced blood supply to the hepatic parenchyma would be the main risk factor of TACE induced complications, such as portal vein obstruction, hepatic function impairment, biliary tract obstruction, previous hepatobiliary surgery, excessive lipiodol injection, and non-selective arterial embolization.¹

In terms of biliary complications after TACE, the incidence was reported with a wide range between 0.9% and 12.5%.^{10,11} Unlike the hepatic parenchyma, the blood flow to intrahepatic bile ducts receives only from the hepatic artery branches, which form a vascular plexus known as peribiliary capillary plexus. Peribiliary capillary plexus is usually hypertrophied in patients with liver cirrhosis and known to have a protective effect on bile ducts for the ischemic insults.¹² Yu et al.¹³ reported that the biliary complications were more frequently developed in patients with non-HCC and relatively good liver function (Child-Pugh class A) than with advanced cirrhotic liver. Moreover, repeated treatment of TACE is also considered important risk factors to bile duct complications.^{1,13-15} This is because recurrent vasculitis and repeated thrombosis caused by repeated TACE may predispose the bile ducts to ischemic insult.¹³ Furthermore, the total amount of iodized oil, chemotherapeutic agents, microspheres, gelfoam, and drug-eluting beads are reported as other risk factors.¹³⁻¹⁵ In this case report, repeated RFA and TACE might have a role for the development of bile duct complications (multiple severe biloma and bile duct stricture).

Although biliary complications including intrahepatic biloma, bile duct necrosis, acute cholecystitis, and a hepatic abscess, can be treated conservatively, percutaneous or endoscopic drainage and partial hepatectomy might be needed in cases of a severe sign

of infection and/or progressive biloma.² If appropriate therapeutic intervention is not performed on time, life-threatening clinical outcomes could be incurred, such as bronchobiliary or biliopleural fistula, progressive biloma, septic shock, and multiple organ failure.^{2,16} PCD is well established interventional therapy to treat intrahepatic biloma. However, the clinical effect of endoscopic balloon dilation or stenting for intrahepatic bile duct stricture is still unclear while the endoscopic role of malignant biliary stricture or anastomotic benign biliary stricture after liver transplantation has been well established.^{17,18}

We herein report a case of TACE induced biliary complications which were treated with a multi-disciplinary approach; intrahepatic progressive biloma was treated with PCD, intrahepatic bile duct stricture was treated by endoscopic balloon dilation and plastic stent placement.

Conflicts of interest

No potential conflict of interest relevant to this article was reported.

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