Treatment of a huge biloma complicating curative radiofrequency ablation of hepatocellular carcinoma: a case report

Haochen Wang, Ziguang Yan, Jian Wang and Yinghua Zou

Abstract
Development of a huge intrahepatic biloma after radiofrequency ablation (RFA) is a rare complication. We report a patient with hepatocellular carcinoma (HCC) who had been treated by RFA and was complicated by a huge biloma. The biloma was cured by percutaneous catheter drainage and endoscopic retrograde cholangiopancreatography. A plastic stent was placed from the duodenal ampulla to the common bile duct to lower the pressure. The catheter and the stent were removed within 1 month after the biloma had disappeared. There was no recurrence of the biloma and HCC lesions with a follow-up time of 2 years. The present case is one of the best reported outcomes after development of a huge biloma.

Keywords
Radiofrequency ablation, biloma, hepatocellular carcinoma, percutaneous catheter drainage, endoscopic retrograde cholangiopancreatography, stent

Date received: 27 April 2019; accepted: 7 August 2019

Introduction
Biloma was first reported in 1979 to describe abnormal bile accumulation outside the biliary tree. Biloma is considered to result from abdominal trauma, biliary surgery, endoscopic retrograde cholangiopancreatography (ERCP), and laparoscopic
cholecystectomy,2–4 and it can occur spontaneously.5 Percutaneous radiological procedures, such as transcatheter arterial chemoembolization,4 percutaneous ethanol injection,4 microwave ablation,6 and percutaneous biliary drainage,7 can also be complicated by biloma. We report here a patient with hepatocellular carcinoma (HCC) who was treated by radiofrequency ablation (RFA) and complicated by a huge biloma. However, after treatment of approximately 1 month, his biloma was completely released. In the ensuing 2 years, the patient has been free from recurrence of the biloma and HCC. We also discuss our experience about the treatment process of the biloma and HCC.

Case report
This study was approved by the Ethics Committee of Peking University First Hospital. Written informed consent for all therapeutic procedures that were performed was obtained from the patient before the procedures.

A 50-year-old man with two confirmed small HCC nodules was admitted to our department (Figure 1). The two lesions could not be operated on through one puncture. The patient developed intolerable pain during RFA. He received RFA two times for curative treatment of the HCC lesions. The first day after the second RFA, the patient suffered from fever, chills, and abdominal pain. A computed tomography (CT) scan showed low-attenuated areas under the liver capsule (Figure 2). Hemostatic measures were provided according to the imaging finding and a simultaneous drop in the hemoglobin level. One week later, his symptoms were relieved and he was discharged from our hospital.

Figure 1. Computed tomography shows two hepatocellular carcinoma nodules (arrow).
Two weeks after discharge, the patient had fever, chills, and abdominal pain again. A CT scan showed 18 × 13-cm fluid collection under the liver capsule (Figure 3). Percutaneous catheter drainage was performed with an 8-French catheter. The contents were bilious fluid (approximately 2000 mL). The bilirubin level in the fluid was 52.8 μmol/L. Drainage was continued with a volume of 600 to 800 mL of bile fluid per day, without any sign of reduction. Magnetic resonance cholangiopancreatography (MRCP) was performed and showed stenosis in the right hepatic bile duct (Figure 4). By contrast, ERCP showed no stenosis in the hepatic bile ducts. However, spasm of the duodenal ampulla was found to be persistent and a guidewire encountered resistance when passing through the duodenal ampulla and common bile duct. A plastic stent was placed from the duodenal ampulla to the common bile duct (Figure 5). A considerable decrease in bile drainage was encountered in the following days of the stent placement. The percutaneously placed drainage catheter was removed 1 week after the biloma had totally disappeared on a follow-up CT scan. The patient was discharged home with no more abdominal pain, but sometimes experienced a slight fever. Three weeks later, the plastic stent was removed. The patient did not feel any discomfort and entered the out-patient follow-up procedure. CT scans after 6 months, and 1 and 2 years showed no recurrence of the biloma and HCC lesions, while the distal branch of the right upper bile ducts was slightly distended (Figure 6).

Discussion

Chang et al. reported that 109 (3.3%) bilomas occurred in 3284 sessions of RFA. In other large groups of patients, symptomatic biloma occurred in 0.2% to 1.3% of them after RFA. Development of a large intrahepatic biloma after RFA, which is rare, was first reported in 2003. In that case, the biloma was cured in more than 2 months after percutaneous catheter drainage for the biloma and ERCP stenting. However, the patient died 6 months later with the internal stent still in place. In our patient, the biloma was cured within only 1 month and the drainage catheter and ERCP stent were then removed. To the
best of our knowledge, this is the shortest time for treatment among any patient who has suffered from a huge biloma after RFA. Diagnosing and treating a biloma as early as possible are important for patients. Ultrasonography, CT, MRI, MRCP, and ERCP are useful for diagnosing a biloma. If a lesion is observed is association with an injured biliary tree, or the contents are bilious fluid (the bilirubin level in the fluid must be much higher than that in the blood), a biloma can be confirmed. Hepatic subcapsular hemorrhage, which can also occur after RFA, is an important differential diagnosis. Rupture of the bile duct is considered as the first important reason for formation of a biloma. Additionally, increased

Figure 4. Magnetic resonance cholangiopancreatography shows stenosis in the right hepatic bile duct

Figure 5. (a) Spasm of the duodenal ampulla (arrow). (b) A plastic stent was placed from the duodenal ampulla to the common bile duct (arrow)
intraductal pressure, which is usually caused by spasm of the sphincter of Oddi, obstruction by a tumor or stone, or necrosis of a portion of the bile duct wall, is another precondition for leaking bile accumulating in the cavity. MRCP or ERCP can be used to observe stenosis or obstruction in the bile duct.

Percutaneous catheter drainage is preferred for treating a huge biloma, and this can promote the bile duct to heal. However, in some cases, huge bilomas cannot be treated only by drainage. Although ERCP has been incriminated in the occurrence of biliary tract rupture, endoscopic management can be simultaneously used to lower pressure in the biliary tree. Drainage and ERCP management are an effective method of treating bilomas. In our patient, ERCP showed spasm of the sphincter of Oddi, while MRCP showed that there may be stenosis in the right hepatic bile duct. Once a stent was placed in the common bile duct to lower the pressure, the amount of drainage was greatly reduced.

Our experience suggests that decompression treatment by both drainage and endoscopic means should be considered in patients with huge bilomas. Additionally, we consider that the ERCP stent should be removed in several weeks after complete resolution of a huge biloma.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ORCID iD

Jian Wang https://orcid.org/0000-0002-7653-9577

References

1. Gould L and Patel A. Ultrasound detection of extrahepatic encapsulated bile: “biloma”. AJR Am J Roentgenol 1979; 132: 1014–1015.
2. VanSonnenberg E, D’Agostino HB, Easter DW, et al. Complications of laparoscopic cholecystectomy: coordinated radiologic
3. Esensten M, Ralls PW, Colletti P, et al. Posttraumatic intrahepatic biloma: sonographic diagnosis. *AJR Am J Roentgenol* 1983; 140: 303–305.

4. Koda M, Murawaki Y, Mitsuda A, et al. Combination therapy with transcatheter arterial chemoembolization and percutaneous ethanol injection compared with percutaneous ethanol injection alone for patients with small hepatocellular carcinoma. *Cancer* 2001; 92: 1516–1524.

5. Fujiwara H, Yamamoto M, Takahashi M, et al. Spontaneous rupture of an intrahepatic bile duct with biloma treated by percutaneous drainage and endoscopic sphincterotomy. *Am J Gastroenterol* 1998; 93: 2282–2284.

6. Shimada S, Hirot a M, Beppu T, et al. Complications and management of microwave coagulation therapy for primary and metastatic liver tumors. *Surg Today* 1998; 28: 1130–1137.

7. Winick AB, Waybill PN and Venbrux AC. Complications of percutaneous transhepatic biliary interventions. *Tech Vasc Interv Radiol* 2001; 4: 200–206.

8. Chang IS, Rhim H, Kim SH, et al. Biloma formation after radiofrequency ablation of hepatocellular carcinoma: incidence, imaging features, and clinical significance. *AJR Am J Roentgenol* 2010; 195: 1131–1136.

9. Curley SA, Mar ra P, Beat y K, et al. Early and late complications after radiofrequency ablation of malignant liver tumors in 608 patients. *Ann Surg* 2004; 239: 450–458.

10. Rhim H, Yoon KH, Lee JM, et al. Major complications after radio-frequency thermal ablation of hepatic tumors: spectrum of imaging findings *Radiographics* 2003; 23: 123–134; discussion 134-6.

11. Akahane M, Koga H, Kato N, et al. Complications of percutaneous radiofrequency ablation for hepatocellular carcinoma: imaging spectrum and management. *Radiographics* 2005; 25: S57–S68.

12. Shankar S, vanSonnenberg E, Silverman SG, et al. Diagnosis and treatment of intrahepatic biloma complicating radiofrequency ablation of hepatic metastases. *AJR Am J Roentgenol* 2003; 181: 475–477.

13. Tana C, D’Alessandro P, Tartaro A, et al. Sonographic assessment of a suspected biloma: a case report and review of the literature. *World J Radiol* 2013; 5: 220–225.

14. Trivedi PJ, Gupta P, Phillips-Hughes J, et al. Biloma: an unusual complication in a patient with pancreatic cancer. *World J Gastroenterol* 2009; 15: 5218–5220.

15. Urbain D, Muls V, Kiromera A, et al. Nontraumatic intrahepatic rupture of the biliary tree with biloma: the place of ERCP. *Gastrointest Endosc* 1992; 38: 379–381.

16. Peterson IM and Neumann CH. Focal hepatic infarction with bile lake formation. *Am J Roentgenol* 1984; 142: 1155–1156.

17. Brown S, Giuseppucci P and Esper C. Rare reported left hepatic subcapsular biloma and management. *Case Rep Surg* 2017; 2017: 8609185.

18. Dupas JL, Mancheron H, Sevenet F, et al. Hepatic subcapsular biloma. An unusual complication of endoscopic retrograde cholangiopancreatography. *Gastroenterol* 1988; 94: 1225–1227.

19. Mizuno O, Kawamoto H, Fukatsu H, et al. An iatrogenic hepatic subcapsular biloma successfully treated by percutaneous drainage and endoscopic biliary stenting. *Endoscopy* 2008; 40: e42–e43.