

The Complication of Hepatic Artery Injuries of 1,304 Percutaneous Transhepatic Biliary Drainage in a Single Institute

En-Li Shiau, MD, Huei-Lung Liang, MD, Yih-Huie Lin, MD, Ming-Feng Li, MD, Chia-Ling Chiang, MD, Matt Chiung-Yu Chen, MD, Jer-Shyung Huang, MD, and Huay-Ben Pan, MD

ABSTRACT

Purpose: To determine frequency of and assess risk factors for hepatic artery (HA) injury during percutaneous transhepatic biliary drainage (PTBD) and to discuss the technique and report the clinical outcome of embolization for HA injury.

Materials and Methods: Over a 14-year period (2002–2016), 1,304 PTBD procedures in 920 patients were recorded. The incidence of HA injury was determined, and possible associated risk factors were analyzed. When injury occurred, HA embolization was performed at the site as close to the bleeding point as possible. Clinical outcomes of these patients after embolization were reported.

Results: Of 1,304 PTBD procedures, a left-sided approach was used in 722 procedures (55.4%), and intrahepatic duct (IHD) puncture under ultrasound guidance was used in 1,161 procedures (90.1%). The IHD was nondilated in 124 (9.5%) patients. The punctured ductal entry site was peripheral in 1,181 (90.6%) patients. In this series, 8 procedures (0.61%) were complicated by HA injury. IHD dilatation status was the only risk factor ($P = .017$) for HA injury. Embolization was performed with technical and clinical success in all 8 patients. No recurrent hemobilia, intraabdominal bleeding, or other sequelae of HA injury after embolization was noted during 1 week to 84 months of follow-up.

Conclusions: HA injury is a relatively rare complication of PTBD. IHD dilatation status was the only risk factor for HA injury in this study. When HA injury occurred, embolization therapy was effective in managing this complication.

ABBREVIATIONS

HA = hepatic artery, IHD = intrahepatic duct, PACS = picture archiving and communication system, PTBD = percutaneous transhepatic biliary drainage

Percutaneous transhepatic biliary drainage (PTBD) is now widely adopted for diversion of bile flow in the setting of either malignant biliary obstruction or benign causes of obstruction such as biliary stricture, bile leakage following surgery, and biliary stones. Hepatic artery (HA) injury,

manifesting as hemobilia (bloody bile from the drainage catheter or the occurrence of tarry stool), hemoperitoneum, or subcapsular hemorrhage (1), is an infrequent but serious complication, occurring in 1.3%–8% of PTBD procedures (1–9). Quality improvement guidelines for percutaneous transhepatic cholangiography and PTBD published in 2010 (8) indicated a 2.5% average rate of hemorrhage and suggested an acceptable threshold rate of 5.0%. The risk factors associated with HA injury after PTBD are controversial. Fidelman et al (7) considered the use of large-bore (18-gauge sheathed) needles and placement of 3 drainage catheters on the same day to be associated with HA injury. Choi et al (9), after reviewing 3,110 PTBD procedures, concluded that left-sided PTBD was the only independent risk factor associated with HA injury. As the risk factors for HA injury are still controversial with wide ranges of reported complication rates (1.3%–8%), this study retrospectively evaluated the frequency of and risk factors for HA injury in patients undergoing PTBD. Angiographic

From the Department of Radiology (E.-L.S., H.-L.L., Y.-H.L., M.-F.L., C.-L.C., J.-S.H., H.-B.P.), Kaohsiung Veterans General Hospital, 386 Ta-Chung First Road, Kaohsiung 813, Taiwan; National Defense Medical Center (H.-L.L.), Taipei, Taiwan; School of Medicine (E.-L.S., H.-L.L., M.-F.L., C.-L.C., J.-S.H., H.-B.P.), National Yang-Ming University, Taipei, Taiwan; and Department of Radiology (M.C.-Y.C.), Yuan's General Hospital, Kaohsiung, Taiwan. Received September 12, 2014; final revision received March 3, 2017; accepted March 10, 2017. Address correspondence to H.-L.L.; E-mail: hlliang@vghks.gov.tw

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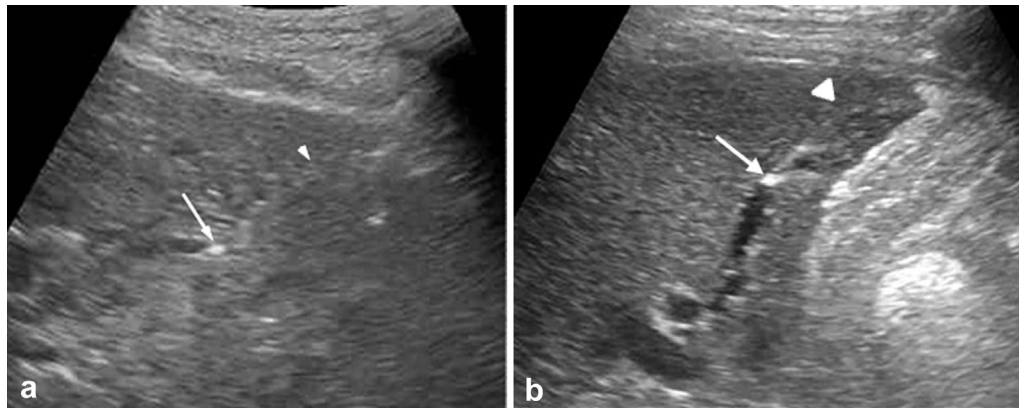


Figure 1. Fine-needle puncture of IHD under US guidance. **(a)** US image (transverse view) of the left lobe of the liver demonstrated the echogenic needle tip (arrow) in the mildly dilated left IHD and the needle tract in the liver parenchyma (arrowhead). **(b)** US image (intercostal view) of the right lobe of the liver demonstrated the echogenic needle tip (arrow) in the dilated segment 5 IHD and the needle tract in the liver parenchyma (arrowhead).

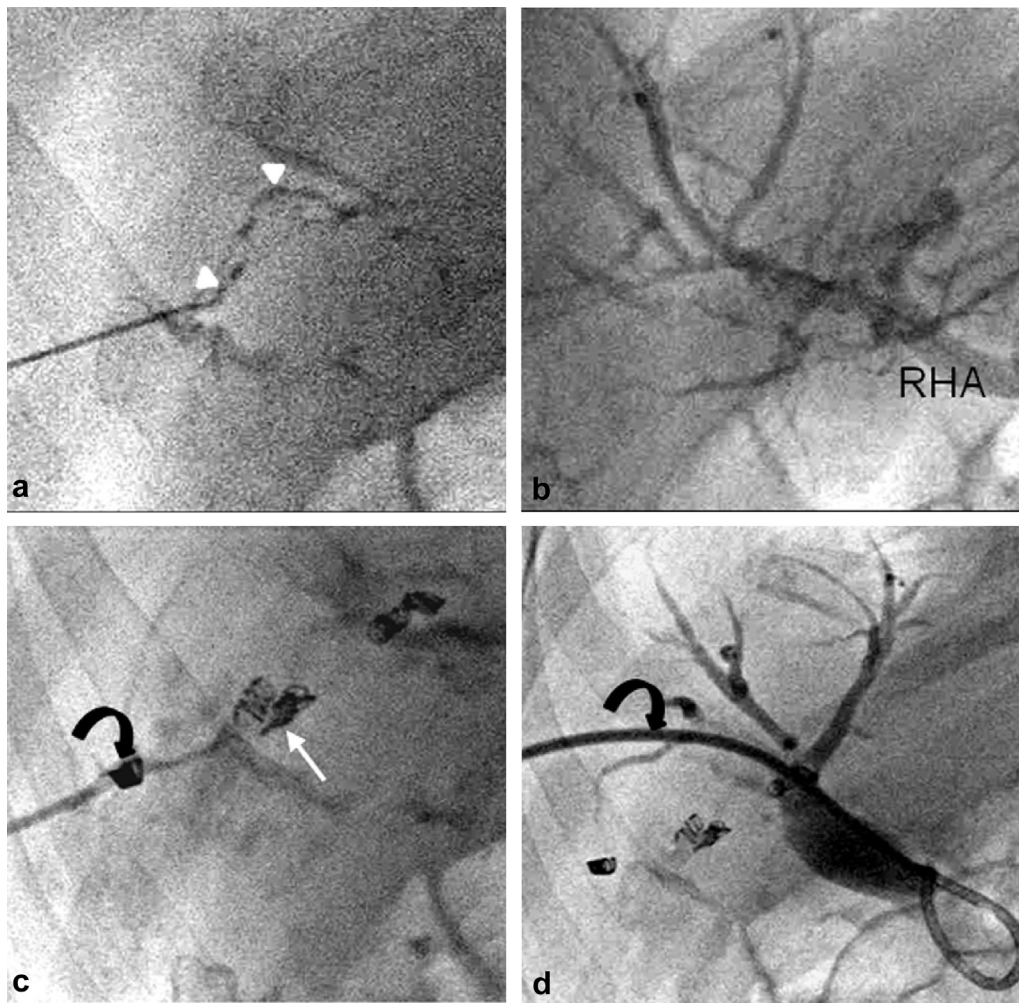


Figure 2. A 67-year-old male patient with pancreatic head carcinoma. **(a)** Cholangiogram obtained via fine-needle contrast injection showed minimally dilated right IHD (arrowhead). **(b)** Contrast medium injection after Neff Percutaneous Access Set insertion opacified the HA, which was inadvertently entered. RHA = right hepatic artery. **(c)** Embolization of the right peripheral HA (arrow) and liver parenchyma tract (curved arrow) was achieved by metallic coils. **(d)** Another puncture of a right peripheral IHD (curved arrow) was performed, and an 8-F pigtail drainage catheter was inserted.

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