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A novel endoscopic treatment of major bile duct leak

Aiman Al Wahaibi^a, Khalid AlNaamani^{b,c,d,*}, Ahmed Alkindi^{e,f}, Issa Al Qarshoubi^{g,h,i}^a Department of Medicine, Oman Medical Specialty Board, Muscat, Oman^b Department of Medicine, Armed Forces Hospital, Muscat, Oman^c Division of Gastroenterology, Armed Forces Hospital, Muscat, Oman^d Division of Therapeutic Endoscopy, Armed Forces Hospital, Muscat, Oman^e Department of Surgery, Armed Forces Hospital, Muscat, Oman^f Division of Hepatobiliary Surgery, Armed Forces Hospital, Muscat, Oman^g Department of Medicine, Sultan Qaboos University Hospital, Muscat, Oman^h Division of Gastroenterology, Sultan Qaboos University Hospital, Muscat, Omanⁱ Division of Therapeutic Endoscopy, Sultan Qaboos University Hospital, Muscat, Oman

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ABSTRACT

INTRODUCTION: Bile leak is a serious complication of hepatobiliary surgery. The incidence has remained the same over the last decade despite significant improvement in the results of liver surgery.

PRESENTATION OF CASE: A 21-year-old man was a passenger in a motor vehicle and sustained a blunt abdominal trauma in a high-speed collision leading to major liver laceration. He had right lobe hepatectomy complicated by major bile leak. He was not fit for further surgery and he, therefore, had ERCP and obliteration of the leaking bile duct using a combination of metallic coil and N-butyl cyanoacrylate.

DISCUSSION: Endoscopic therapy has become the modality of choice in the treatment of biliary tract injuries. Different modalities of management of persistent bile leak such as sphincterotomy, plastic biliary stents, and nasobiliary drainage have been described. Obliteration of bile duct leak using N-butyl cyanoacrylate and coil embolization has been described but most of these reports used the percutaneous transhepatic approach.

CONCLUSION: In this paper, we describe the second reported case in English literature of a novel endoscopic technique using a combination of metallic coil embolization and N-butyl cyanoacrylate in a patient with major bile leak who was not a candidate for surgery as well as a third report of the late complication of coil migration to the common bile duct.

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1. Introduction

A major blunt abdominal trauma is the leading cause of hepatic injury and significant damage to the biliary tract causing intrahepatic biloma, intraperitoneal bile leak and hemobilia.^{1–3} Partial liver resection has been widely used as an effective treatment for severely injured liver.⁴ Bile leak is a serious complication that may lead to sepsis and peritonitis and, therefore, has high mortality rate if left untreated. The incidence of bile leak posthepatobiliary surgery varies and ranges from 3.6 to 12%.⁴ This incidence has remained the same over the last decade despite a significant improvement in the results of liver surgery.^{5–7}

Endoscopic therapy has become the predominant modality of choice used in both the diagnosis and treatment of biliary tract injuries.⁸

In this paper, we describe a novel endoscopic treatment used in a patient who underwent right hepatectomy for severe liver injury complicated by a major bile leak who was not a candidate for further surgery.

2. Case report

A 21-year-old man was the driver of a motor vehicle and sustained a blunt abdominal trauma in a high-speed collision leading to major liver laceration. The patient was initially managed at a secondary care hospital where he underwent liver packing. He received 20 units of packed red blood cells (PRBC) with fresh frozen plasma (FFP) and was transferred to the Armed Forces Hospital (AFH) for further management. At AFH he required more blood and FFP. However, he continued to bleed from the site of the liver laceration and underwent emergency right hepatectomy.

He remained intubated with mechanical ventilation in the intensive care unit (ICU) for three months. His prolonged ICU course was complicated by pneumothorax, sepsis, bed sores, renal failure, coagulopathy, and cardiac arrest on day 15 of his ICU admission. He had deranged liver enzymes and abnormal liver function associated with abdominal distension and drain of bile from the abdominal drainage.

* Corresponding author at: Armed Forces Hospital, P.O. Box 1438, PC 121 Seeb, Muscat, Oman. Tel.: +968 99100517; fax: +968 24331682.

E-mail address: noumani73@gmail.com (K. AlNaamani).

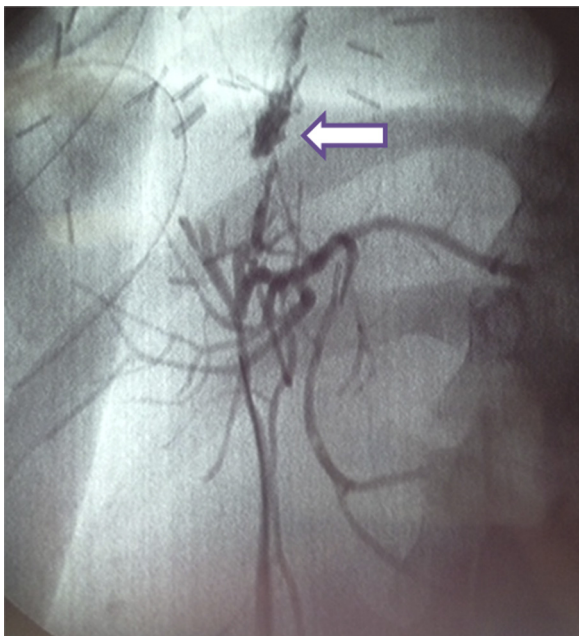


Fig. 1. Major bile leak from one of the main branches of left main bile duct.

Endoscopic retrograde cholangiopancreatography (ERCP) was performed which confirmed a major bile leak from one of the main branches of the left main bile duct on the resected edge (Fig. 1). A 10 Fr 5 cm plastic stent was inserted with good biliary drainage. Sphincterotomy was not performed due to coagulopathy.

There was an improvement in the abdominal distension, bile drainage and liver function for about three weeks. He started to have abdominal distension some days later with deranged liver chemistry, mainly high bilirubin and alkaline phosphate. Blocked or migrated stent was anticipated and he underwent a second ERCP for stent replacement. However, the previous stent was in place with good drainage. Injection of contrast into the biliary tree beside the stent revealed a major leak from the right hepatic duct stump (Fig. 2).

The patient was considered high risk for any further surgical intervention. The plastic stent was removed and the leaking bile

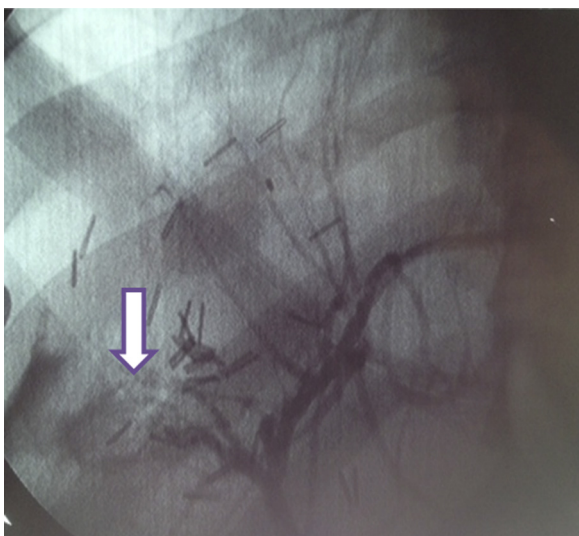


Fig. 2. Major leak from right hepatic duct stump.

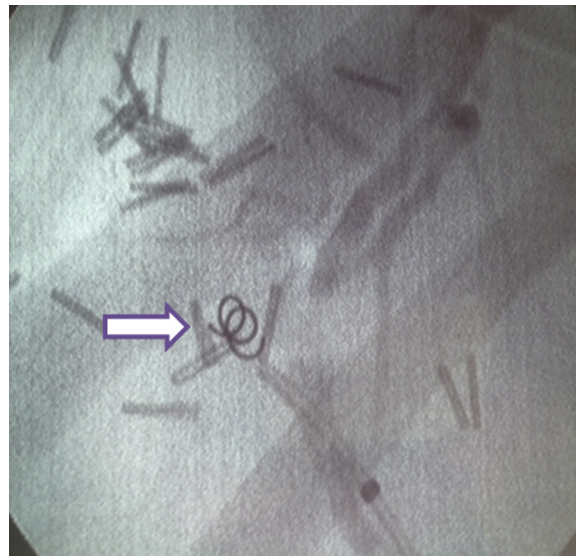


Fig. 3. Embolization of metallic coil into the leaking duct.

branch was selectively cannulated using a 0.035 mm Boston Scientific guide wire. A metallic endovascular coil (3/30 mm), (Boston Scientific) was deployed in the terminal end of the leaking bile duct followed by an injection of 1.5 ml of a mixture of NBCA and lipidol at a ratio of 2:1 (Fig. 3).

There was marked improvement in his liver enzymes and bile drainage postendoscopic intervention. His general condition improved and he was discharged home (Fig. 4).

The endovascular coil remained in place on CT abdomen done three months postendoscopic intervention (Fig. 5).

Six months postdischarge, he presented with abdominal pain and low grade fever. He had mild elevation in his liver enzymes with preserved function. CT abdomen revealed mildly dilated CBD with a radio-opaque object most likely migrated endovascular coil at the distal CBD causing biliary obstruction (Fig. 6)

He was treated initially with antibiotics. ERCP was performed three days after his presentation. However, the CBD was found to be patent; most likely he passed the endovascular coil.



Fig. 4. Postdeployment cholangiogram revealed no bile leak.

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