Endoscopic management of biliary leak following gunshot wound to the liver

Atif Saleem¹, Todd H. Baron²

¹East Tennessee State University, Johnson City, TN, USA; ²Division of Gastroenterology, Mayo Clinic, Rochester, MN, USA

Key words: biliary leak, liver laceration, biliary sphincterotomy, biliary stent

Biliary leaks can be due to blunt trauma (seat belt injuries), penetrating trauma (gunshot wound) or iatrogenic (post-cholecystectomy or hepatobiliary surgery). We present a case of bile leak after surgical repair of a grade 3 liver lacerations from a gunshot wound which was managed endoscopically.

Case report

An 18 year-old male underwent emergent exploratory laparotomy after sustaining a gunshot wound to right upper abdomen resulting in grade 3 right liver lobe laceration and massive hemoperitoneum. Initially bleeding was controlled with Gelfoam followed by laparotomy pad packing and temporary abdominal closure (**Fig.1**). The patient was hemodynamically resuscitated; multiple blood transfusions were given and he was managed in the intensive care unit. The following day angiography showed active bleeding from the right posterior hepatic artery which was successfully embolized. Repeat exploratory laparotomy was performed and with repair of a right hepatic vein injury and the abdominal wall was closed and a surgical drain remained in place.

One week later abdominal CT scan showed irregularly shaped enhancing fluid collections in the upper abdomen with the largest components located in the right sub-diaphragmatic space (11 cm×4 cm×12 cm) and left of midline (9 cm×15 cm×10 cm). Percutaneous drainage was performed. Following resolution of these collections, one of the drains continued to leak bile.

ERCP was performed and cholangiography showed extravasation of contrast from the right intrahepatic ducts (**Fig. 2**). A biliary sphincterotomy was performed and a 10 Fr plastic biliary stent (10 Fr×5 cm) was placed across the major papilla. The patient was discharged home several days later without subsequent adverse events.

One week after ERCP the bile output ceased and the percutaneous drains were removed. The patient was lost to follow-up for two years but during this time he remained asymptomatic. He eventually returned for elective biliary stent removal, which was uncomplicated.

Figure 1. Intraoperative photograph taken during emergent laparotomy showing severe liver laceration after gunshot wound to the right abdomen.

Figure 2. Cholangiogram shows extravasation of contrast in the right intrahepatic system which communicated with the known subdiaphragmatic collection. Note the presence of a percutaneous drain and coils from prior hepatic artery embolization (arrow).

*Correspondence to: Todd H. Baron; Email: baron.todd@mayo.edu
Submitted: Dec/11/2011; Revised: Dec/16/2011; Accepted: Dec/26/2011
Previously published online: www.landesbioscience.com/journals/jig
DOI: 10.4161/jig.22204

Discussion

Management of biliary leaks after penetrating liver injuries is challenging. High-grade biliary leaks after severe liver laceration are amenable to endoscopic treatment. A biliary sphincterotomy with large diameter endobiliary stent placement relieves the pressure gradient between the bile duct and the duodenum, resulting in increase the flow from high resistance (biliary tree) to low resistance (duodenum), thereby allowing closure of the leak. In the setting of bile leaks involving the common duct crossing the leak site is preferred¹, but this is not possible with intrahepatic leaks. In addition, our patient had small diameter ducts throughout

and thus we elected to place a short length stent. Although biliary sphincterotomy does not add additional drainage, data from our institution shows a reduced rate of pancreatitis when large-bore plastic stents are placed for bile leaks when sphincterotomy is performed.²

References

1. Bridges A, Wilcox CM, Varadarajulu S. Endoscopic management of traumatic bile leaks. *Gastrointest Endosc* 2007; 65:1081-5.
2. Simmons DT, Petersen BT, Gostout CJ, Levy MJ, Topazian MD, Baron TH. Risk of pancreatitis following endoscopically placed large-bore plastic biliary stents with and without biliary sphincterotomy for management of postoperative bile leaks *Surg Endosc* 2008; 22:1459-63.