Endoscopic management is the treatment of choice for bile leaks after liver resection

Alexander Dechêne, MD,[1] Christoph Jochum, MD,[1] Christian Fingas, MD,[1,2] Andreas Paul, MD, Prof,[2] Dominik Heider, PhD,[3] Wing-Kin Syn, MBChB, Prof,[4] Guido Gerken, MD, Prof,[1] Ali Canbay, MD, Prof,*[,1] Thomas Zöpf, MD*[,1,5]

Essen, Karlsruhe, Germany; London, United Kingdom

Background: Despite improvements in surgical techniques and postoperative patient care, bile leaks still occur postoperatively in as many as 15% of liver resections (LRs) and are associated with high mortality. There is a paucity of outcome data on endoscopic treatment of complex bile leaks.

Objective: The aim of this retrospective study was to evaluate the efficacy of interventional endoscopy in the treatment of bile leaks after LR.

Design: Retrospective interventional study.

Setting, Patients, and Interventions: Sixty patients with bile leaks after LR were treated endoscopically with or without implantation of endoprostheses by using ERCP. The characteristics of LR, effects of surgical and other nonendoscopic treatment measures, clinical and endoscopic presentation of bile leaks, and outcomes after stent placement were recorded.

Main Outcome Measure: Main outcome measure was resolution of leakage or termination of unsuccessful endoscopic leakage therapy.

Results: The median age of the observed cohort was 58 years. Sixty-five percent of patients had central and 35% peripheral bile leaks; 55% had resection of an entire hepatic lobe, and 45% underwent segmental resection. The overall success rate of endoscopic therapy was 77%. Although endoscopic therapy was performed in all patients with a mean of 2.6 interventions, 28% underwent additional percutaneous drainage. Success of endoscopic treatment was related to stent implantation. Thirteen patients with unsuccessful endoscopic treatment underwent surgical reintervention, and 1 patient died before surgical intervention.

Limitations: No standardized protocol for stent placement due to retrospective nature of the study. Small sample number with uneven distribution of outcome.

Conclusions: Endoscopic therapy with sphincterotomy and insertion of endoprostheses is effective, even in large postoperative bile leaks and particularly for leaks proximal to the common hepatic duct. Complete resolution of the leakage often necessitates multiple treatment sessions. (Gastrointest Endosc 2014;80:626-33.)

Liver resection (LR) is an established surgical procedure in the management of benign and malignant liver diseases. Despite the constant improvements in surgical techniques and postoperative patient care over the past decade, bile leaks still occur in approximately 15% of all LRs.[1-7] Bile leaks are serious adverse events with mortality rates as high as 40%.[4] The leakage of bile and blood into the peritoneal cavity impairs host defense mechanisms

Abbreviations: CHD, common hepatic duct; LR, liver resection.

DISCLOSURE: *All authors disclosed no financial relationships relevant to this publication.*

*Drs Canbay and Zöpf contributed equally to this article.

0016-5107/$36.00
http://dx.doi.org/10.1016/j.gie.2014.02.1028

Received August 9, 2013. Accepted February 27, 2014.

Current affiliations: Departments of Gastroenterology and Hepatology (1), General Surgery and Transplantation (2), University Hospital, University Duisburg-Essen, Essen, Germany, Department of Bioinformatics, Center for Medical Biotechnology, University of Duisburg-Essen, Essen, Germany (3), Regeneration and Repair Group, The Institute of Hepatology, London, United Kingdom (4), Department of Internal Medicine and Gastroenterology, Diakonissen-Krankenhaus Rüppurr, Karlsruhe, Germany (5).

Reprint requests: Ali Canbay, MD, Department of Gastroenterology and Hepatology, University Hospital, University Duisburg-Essen, Hufelandstr. 55, 45122 Essen, Germany.

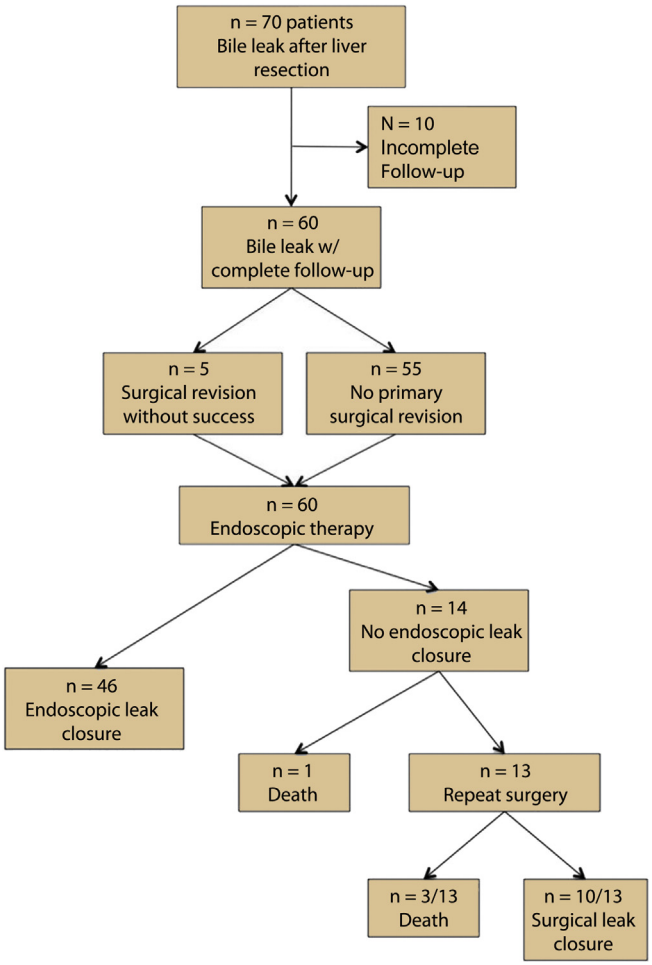

Figure 1. Clinical course of treated patients.

and predisposes to sepsis, liver failure, and death. Surgical reinterventions in these cases are associated with comparable mortality rates as high as 38%.[6] Postoperative bile leaks can be classified into peripheral bile leaks resulting from the surface of resection and central bile leaks from the hilum or the common hepatic duct (CHD). Compared with peripheral bile leaks, central bile duct leakage is usually associated with a larger volume of bile flow and may be associated with a worse prognosis. In LR for peripheral cholangiocarcinoma, it has been shown that advanced age, high preoperative white blood cell count, prolonged operation time, left-sided hepatectomy, and segment IV resections are risk factors for bile leakage.[4,8,9]

Although endoscopic treatment for bile leaks of the cystic stump after cholecystectomy shows promising results, the optimal interventional endoscopic approach is still a matter of debate.[10-15] Until now, treatment efficiency has not been compared between endoscopic sphincterotomy alone, nasobiliary drainage, endoscopic sphincterotomy in combination with a sphincter-bridging endoprosthesis, or endoprosthesis spanning the actual leak site. Recently, it was reported that differential therapy according to leak size may be favorable to limit the number of endoscopic treatment sessions.[16]

Take-home Message

- Endoscopic treatment of bile leaks after liver resection is safe and efficient. Treatment should consist of sphincterotomy and stent implantation.
- Patients with leaks from the common bile duct are most likely to require surgical reintervention.

Bile leaks frequently occur after LR, but few studies on the efficacy of endoscopic treatment are available.[4,17,18] Therefore, the primary aim of this observational study was to determine the efficacy of interventional endoscopy in the treatment of complex bile leaks after LR. We also sought to identify patient- and procedure-specific factors that could influence the outcomes of endoscopic therapy.

PATIENTS AND METHODS

Patient cohort and interventions

Seventy consecutive patients with bile leaks after LR treated by endoscopic therapy at the University Hospital Essen (Germany) were identified between January 2001 and October 2012. Ten of these patients were subsequently excluded from analysis because of incomplete follow-up data (a detailed flow diagram of study participants is given in Fig. 1).

All 60 recruited patients presented with significant biliary leakage after LR (leak flow >50 mL/d via intraoperatively placed drainage catheters with bilirubin >2.4 mg/dL in the drain fluid). For patients with clinical and radiological signs of infected bilomas or abscesses, additional percutaneous drains were inserted under CT guidance. All ERCP procedures were performed by experienced endoscopists. Before endoscopic intervention, wire-guided cannulation of the biliary tract was achieved, and complete cholangiograms were obtained. Endoscopic therapy in all patients consisted of wire-guided endoscopic sphincterotomy to reduce intraductal pressure and facilitate transpapillary bile flow. Nonexpanding plastic endoprostheses with a diameter of 7F or 10F were inserted, as determined by the operator. Stent placement was performed to cover or span the bile leakage if possible (ie, not in patients with peripherally located leakage sites or terminal leaks).

Bile leakage classification

During cholangiography, bile leak size was estimated by filling the biliary tract with contrast medium. Bile leaks were classified as small if leakage from the biliary tract was observed only after complete filling of the intrahepatic bile ducts with contrast agent (ie, with higher intraductal pressure). The leakage was classified as large if there was