Journal of Surgical Research **141,** 171–175 (2007)
doi:10.1016/j.jss.2006.07.012

A Single Center Experience in Minimally Invasive Treatment of Postcholecystectomy Bile Leak, Complicated With Biloma Formation

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Submitted for publication April 12, 2006

Background. **Bilomas are localized collections of bile occurring usually post-operatively from an injured cystic or bile duct. Our study aims to evaluate the efficacy of minimal access endoscopic and percutaneous modalities in treating symptomatic bile leak and biloma formation.**

Patients and methods. **Sixteen patients with biloma after open or laparoscopic cholecystectomy underwent assessment of the site and extent of the bile leak via endoscopic retrograde cholangiography (ERC). Endoscopic sphincterotomy was performed in all patients who were managed non-operatively, any retained duct stones were removed, and an endoprosthesis was inserted in a selected basis. Percutaneous drainage of the bile collection, under ultrasound or computed tomography guidance, followed ERC.**

Results. **ERC supplemented by computed tomography or ultrasound guided percutaneous biloma drainage was successful in 15 patients. One patient having major ductal injury was treated surgically. Thirteen patients had leakage from the cystic duct, one from the right hepatic duct, and one from an aberrant right hepatic duct. Bile duct stones were removed from seven patients an endoprosthesis was inserted in six and a nasobilary catheter in one. Bilomas resolved and bile leakage was treated successfully in all 15 patients with no further complications.**

Conclusion. **ERC accurately diagnoses the cause of postcholecystectomy bile leakage and biloma formation. Furthermore, endoscopic sphincterotomy and selective stent insertion in coordination with percutaneous drainage procedures represents in the majority of cases the corner stone of a definitive treatment.**

Key Words: **bile leak; biloma; ERC; percutaneous drainage.**

INTRODUCTION

Bilomas are defined as loculated collections of bile located outside the biliary tree and represent one of the most common and serious complications after cholecystectomy. In recent years the adoption of laparoscopic cholecystectomy has dramatically changed the approach to gallstone disease. However, the laparoscopic technique has been associated with a slight increase in the incidence of biliary leak, particularly in the early years of its introduction. Bile leak and biloma formation may be associated with serious biliary complications resulting in raised morbidity, and mortality, and added expense. Moreover, the bile serves as a culture medium, which could cause intra-abdominal abscess, sepsis, and death [1].

Bile leak after open or laparoscopic cholecystectomy is usually a result of minor biliary complication, although it can sometimes herald a major duct injury. It is estimated that biloma originates from the cystic duct in more than 50% of the cases [2]. In addition several series have reported bile leakage rates of 1.2 to 4% after laparoscopic cholecystectomy that is higher than the incidence in open cholecystectomy [3–5].

Non-surgical treatment has been regarded as the first choice in the management of postoperative bile leakage in the majority of the cases. Endoscopic retrograde cholangiography (ERC) plays a definite role in establishing the diagnosis and can also act as a therapeutic modality when combined with percutaneous procedures. To further evaluate the role of ERC and

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0022-4804/07 $32.00

percutaneous drainage in the treatment of bilomas this retrospective study was undertaken.

PATIENTS AND METHODS

From January 1997 to December 2002 a total of 16 patients, including 10 males and 6 females, were managed for symptomatic bile collection by means of ERC with percutaneous drainage. The mean age of the patients was 54 years ranging from 26 to 76 years. Twelve patients were referred to our endoscopic unit from other Hospitals 5 to 12 days after cholecystectomy, after a mean period of 7 days. Four patients had undergone open and 12 laparoscopic cholecystectomy. In 10 patients who had their surgical drain *in situ*, the average bilious discharge was 300 to 400 mL, daily.

Baseline investigations were performed and revealed elevated white cell count in 12 patients (12 out of 16), and abnormal liver function tests in 14 out of 16. The bilomas were identified in all patients by ultrasonography (US) or computed tomography (CT), or both. Three patients had additionally undergone magnetic resonance cholangiography Scan and two percutaneous fistulography (Fig. 1). The bilomas were sharply demarcated by the under surface of the diaphragm, mesenteries, liver contour, and other adjacent anatomical structures. They were also well marginated, although in most cases they did not have an identifiable capsule on CT or US imaging.

Percutaneous drainage was performed under ultrasound or CT guidance by a radiologist using 8 Fr pigtail catheters. The aspirated fluid was measured and routinely sent for culture and smear.

ERC was performed to delineate the biliary tree anatomy and document the problem and for therapeutic intervention when appropriate (Fig. 2A). Before the procedure, written informed consent was obtained from the patients. During the procedure, sedation and analgesia were achieved with intravenous midazolam and fentanyl titrated to suit age and tolerance. Bowel relaxation was achieved with intravenous hyoscine butylbromide. The patients were monitored with pulse oximetry during the procedure. All of the ERCs were performed by the same endoscopist using the same technique with a

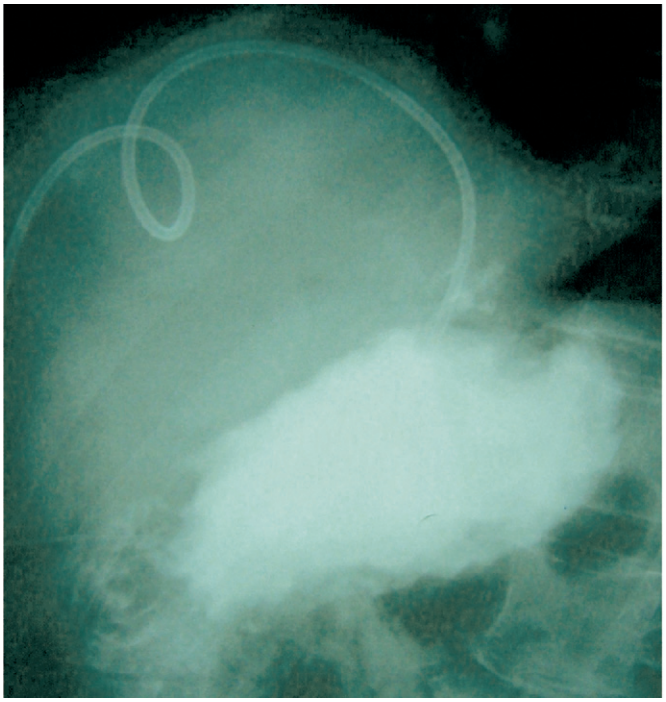
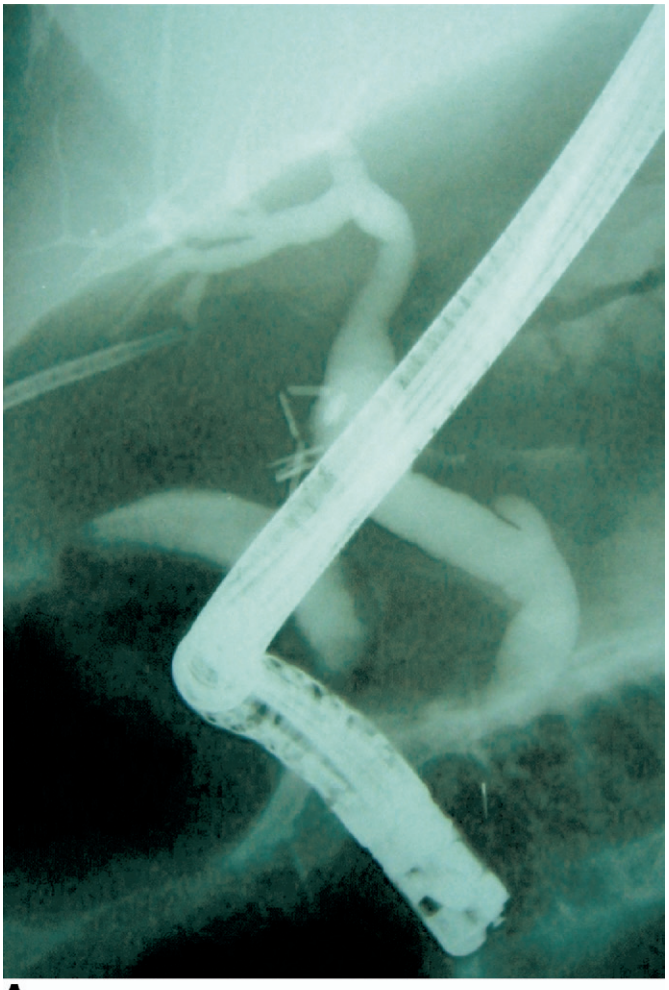
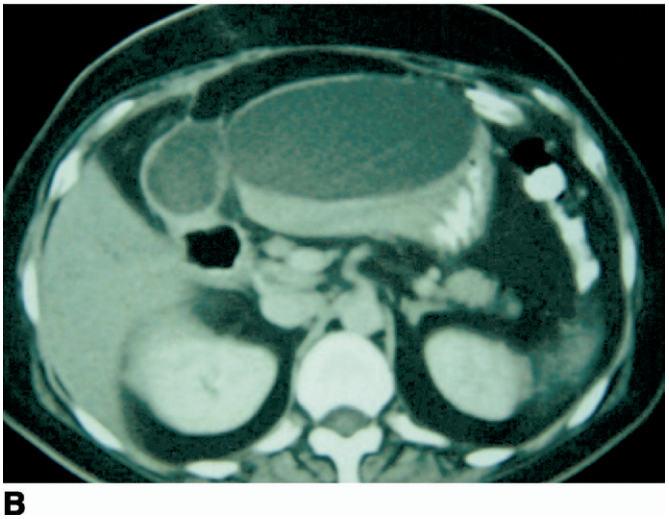


FIG. 1. Percutaneous fistulography via the draining catheter depicting a biloma. (Color version of figure is available online.)



A



B

FIG. 2. (A) Endoscopic retrograde cholangiography made after continued injection of contrast showing complete opacification of the biliary tree and leakage of contrast from the cystic stump. (B) Contrast-enhanced abdominal CT scan demonstrates a sharply demarcated biloma localized at both right and left upper quadrants. The biloma appears well marginated with no identifiable capsule. (Color version of figure is available online.)