Laparoscopic Management of Difficult Recurrent Choledocholithiasis

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ABSTRACT
The management of common bile duct stones has traditionally required open laparotomy and bile duct exploration. With the advent of endoscopic and laparoscopic technology in the latter half of the last century, endoscopic retrograde cholangiopancreatography and laparoscopic common bile duct exploration has become the mainstream treatment for common bile duct stones in most medical centers around the world. However, in some patients, endoscopic retrograde cholangiopancreatography is difficult and laparoscopy is challenging because of previous surgery. These facts are highlighted in this report.

Key Words: Laparoscopic common bile duct exploration, Recurrent choledocholithiasis, Difficult choledocholithiasis.

INTRODUCTION
The management of stones in the common bile duct (CBD) is currently under much debate within the medical literature.1–5 The 3 main approaches are endoscopic retrograde cholangiopancreatography (ERCP), open surgery, and increasingly laparoscopic exploration of the common bile duct (LECBD).1–6 However, the surgical management of difficult and recurrent choledocholithiasis in patients who have had cholecystectomy in the “open” era poses a challenge, first because of the potential difficulty of significant adhesions after open surgery and second because patients often present later in life with the inherent increased risks of age and comorbidity.7,8 Difficult choledocholithiasis is defined as failure of endoscopic stone retrieval for the following reasons: access and cannulation difficulty, the difficult nature of common bile duct stones, and the presence of ERCP-related complications.9 Common bile duct stones are defined as recurrent if they are detected more than 2 years after cholecystectomy.9–12

We present 3 such patients who were successfully managed by LECBD, which has not previously been reported.

METHODS
ERCP was successful in the diagnosis of choledocholithiasis in all the patients (Figure 1). LECBD was performed because CBD stones could not be retrieved during ERCP because (a) 2 patients had large and impacted stones and (b) 1 patient had incomplete stone extraction despite multiple endoscopic sessions.

Port sites were placed as for routine laparoscopic exploration of CBD. Significant adhesions were found that were taken down by using diathermy scissors to facilitate access (Figure 2). An extra 5-mm port was used for placement of a Nathanson retractor to elevate the liver, thus enhancing exposure to the operative field (Figure 3). The CBD was localized by aspiration of bile using a long spinal needle directly through the anterior abdominal wall. The needle was grasped intraperitoneally 5mm from the tip before localization, thus minimizing the risk of the posterior CBD wall by excessive puncture (Figure 4). The overlying peritoneum was carefully dissected, and a longitudinal incision was made in the anterior CBD wall by using an...
Espiner knife and Potts scissors (Figure 5). Free stones were removed by using appropriate graspers (Figure 6), and choledochoscopy was performed to identify and remove residual stones, using either a Dormia basket or a Fogarty catheter. After clearance, the choledochotomy was closed primarily by using interrupted 2/0 Vicryl in 2 patients. In 1 patient, a t-tube was placed and removed 3 weeks later. A drain was placed adjacent to the repair in each case and removed at 48 hours.

RESULTS

Three patients have had the procedure over the past year. The demographics and clinical details are presented in Table 1. None of the patients had any complications during or after surgery. The analgesia requirements excluded simple analgesia, such as paracetamol. Postoperative stay was not prolonged except in 1 patient who required delayed discharge (7 days) because of social circumstances.

CONCLUSION

With the advances in laparoscopic surgery, LECBD is being practiced worldwide. It has been proven not only

Figure 1. Multiple impacted stones in the CBD, could not be retrieved by ERCP.

Figure 2. Adhesions due to previous surgery, divided with diathermy scissors.
feasible but also effective in dealing with CBD stones.\textsuperscript{7,13} LCBDE for difficult recurrent stones is a safe technique provided appropriate surgical experience and equipment are available,\textsuperscript{6–8,13} which is emphasized in this report. Despite the potentially increased risk in this group of patients, it is associated with acceptable operative times, and minimal morbidity and duration of hospital stay.

\textbf{Figure 3.} Photograph showing exposure with the help of Nathanson retractor.

\textbf{Figure 4.} Technique for minimising the chances of injury to posterior wall of CBD while aspiration.

\textbf{Figure 5.} Incision made on anterior wall of CBD using an Espiner\textsuperscript{TM} knife.

\textbf{Figure 6.} Stones being removed using graspers.
Table 1.
Patient Demographics and Treatment

| Patient | Age | Sex | ASA | Time Since Open Cholecystectomy (Years) | Operative Time (Minutes) | Analgesia                        | Hospital Stay (Days) |
|---------|-----|-----|-----|----------------------------------------|--------------------------|----------------------------------|---------------------|
| 1       | 81  | F   | 2   |                                        | 80                       | Diclofenac (150 mg)             | 3                   |
| 2       | 74  | F   | 2   |                                        | 55                       | Morphine (20 mg)                | 2                   |
| 3       | 78  | F   | 2   |                                        | 105                      | Diamorphine (5 mg) Tramadol (150 mg) | 7                   |

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