Impacted common bile duct stone managed by hepaticoduodenostomy: a case report.

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Abstract

We present herein a hepaticoduodenotomy performed for a retained, impacted distal CBD stone in a low resource setting with a good outcome. This impacted stone had complicated an open cholecystectomy for acute cholecystitis by causing the dehiscence of the cystic duct stump as a result of distal biliary obstruction.

Key Clinical message

A bypass procedure such as a hepaticoduodenotomy may be an alternative to the traditional choledochoduodenostomy in the management of the retained, impacted distal CBD stone especially in the presence of sepsis.

Introduction

The management of common bile duct (CBD) stones is well established. An algorithm showing the available strategies for the management of CBD stones following a routine or selective per-operative cholangiogram or a pre-operative endoscopic retrograde cholangiopancreatogram is illustrated in figure 1[1]. Although the laparoscopic exploration for CBD stones has gained grounds over endoscopic retrograde cholangiography (ERCP) and sphincterotomy and duct clearance, there is no consensus as to the ideal approach [2, 3]. The management strategy chosen will depend on personal experience, equipment availability, time and the availability of other departmental expertise [3]. For a distally impacted CBD stone in a low resource setting, an open approach will entail either leaving the stone where it is and carry out a choledochoduodenostomy, or removing the stone through a transduodenal sphincteroplasty [4]. We present herein a hepaticoduodenostomy performed for an impacted distal CBD stone. This retained and impacted stone had complicated an open cholecystectomy for acute cholecystitis by causing biliary leakage from the dehisced ligated cystic duct stump due to back pressure of bile. We present the following case in accordance with the CARE reporting checklist.

Case Presentation

A 40-year-old fit black African farmer was admitted as an emergency with a 3-week history of gradual onset epigastric pain which was burning in nature, constant and radiated to the back and chest. There were no exacerbating or relieving factors. He had recurrent abdominal pain in the past 6 years which was managed conservatively. On this occasion he complained of fever and there was jaundice with a dark urine but no pale stool. He had no relevant past medical history nor risk factors for chronic liver disease. On examination, he had a blood pressure of 153/92 mmHg, heart rate of 81 beats/min, respiratory rate of 22 breaths/min and a temperature of 37.2^0 C. He had an icteric sclera and a tender right hypchondrial mass with a positive Murphy's sign consistent with an acute cholecystitis. An abdominal ultrasound scan demonstrated an acute cholecystitis with a distally impacting CBD stone. A full blood count and renal function tests were normal.

Hepatitis and HIV screen were negative. Liver function tests showed an obstructive picture with raised alkaline phosphatase 763.52ui/l (n: 38-126ui/l), ALAT 80ui/l (n: 0-41), ASAT 32ui/l (n: 0-42). Following resuscitation with Intravenous fluids , broad spectrum antibiotics and intramuscular vitamin K , he consented to a cholecystectomy and a transduodenal sphincterotomy/plasty. At operation, there was an acutely inflamed, intrahepatic, gangrenous gallbladder impacting on the CBD. There was no palpable gallbladder nor common bile duct stone and, the CBD was not dilated. As the patient was unstable anaesthetically, the decision for a staged approach was made to initially treat the gallbladder sepsis followed by post-operative observation for the possible spontaneous passage of the distal CBD stone, or the exploration of the CBD if the patient remained symptomatic. A difficult retrograde cholecystectomy was performed. On the 9th post operative day he developed basal pneumonia which was treated aggressively with intravenous antibiotics, oxygen therapy and chest physiotherapy. On the 20^{th} post operative day there was a sudden biliary leakage via the healing midline abdominal wound. A contrast computed tomography (CT) scan revealed a voluminous right hypochondrial and perihepatic peritoneal purulent collection measuring 682 cc and, an impacted calculi at the base of the CBD. The pancreas was normal. A difficult emergency laparotomy revealed severe biliary leak from the dehisced cystic duct stump with dense adhesions. This was doubly resutured with 2.0 vicryl. Full Kocherisation of the duodenum, allowed the upper aspect of the duodenum (duodenal bulb) to lie comfortably against the dilated CBD. This changed our decision from performing a transduodenal sphincterotomy/plasty to a more straight forward bypass procedure (a cholechoduodenostomy or a hepaticoduodenostomy). Because of the inflamed cystic duct stump and adhesions surrounding the CBD, we opted for a more proximal approach in a hepaticoduodenostomy. A vertical incision was made in the CHD, and a longitudinal incision made in the adjacent duodenum which was then sutured transversely. This side- to side anastomosis was performed in a one layer of continuous sutures of 3/0 absorbable material (vicryl). At completion the anastomosis was diamond- shaped with a stoma diameter of at least 2.5 cm. Following this procedure, a T-tube drainage of the CBD was not necessary. A sub-hepatic drain was inserted. The surgery was complicated by severe biliary leak from the anastomosis which subsided in about 2 weeks. The symptoms of jaundice, pain and fever resolved and the patient was discharged a month after the initial operation. But for the patient's financial difficulties, a follow-up contrast CT scan was planned to assess the nature of the extrahepatic biliary tree and ascertain if the calculi had spontaneously passed.

Discussion

This case demonstrates an open hepaticoduodenostomy procedure being used to rescue the adverse sequelae of an impacted distal CBD stone in a low resource setting. A choledochoduodenostomy (CDD) had traditionally been indicated for palliation in patients with CBD obstruction caused by malignancy, or in elderly patients with impacted stones [5]. A recent prospective study demonstrated CDD as highly effective treatment for choledocholithiasis (CBD stones) in the presence of a dilated CBD, in all age groups with low morbidity and mortality provided a wide anastomosis was accomplished [6]. It has been reported as a more effective treatment of CBD stones than T-tube drainage but regarded as an obsolete therapeutic method due to fears of higher morbidity, reflux cholangitis, hepatic abscess, stone recurrence, pancreatitis and "sump" syndrome [7]. 'Sump' syndrome is theorized to occur from bile stasis and reflux of duodenal contents into the terminal CBD with bacterial overgrowth, resulting in cholangitis or hepatic abscess. The side- to-side CDD is a safe and definitive procedure for the decompression of lower CBD obstruction and has good long-term results with infrequent complications including the 'sump' syndrome [8]. Because of the re-sutured dehisced cystic duct stump and, the inflammation and adhesions below, a higher approach (hepaticoduodenostomy) was utilized (Figure 2). It is essential to ensure that the choledocho/hepaticoduodenostomy is at least 2.5 cm long in order to avoid stenosis, recurrent cholangitis and further stone formation [9]. Except for significant post-operative biliary leakage which was managed conservatively, the outcome was successful as the jaundice, pain and rigors resolved. Biliary anastomoses do not seal easily as intestinal anastomoses and, thus the indication for a sub-hepatic drain [10]. A hepaticoduodenostomy for obstructive common bile duct stone has not been reported in the English literature. Hepaticoduodenostomy (HD) is becoming an alternative to the Roux-en-Y hepaticojejunostomy (HJ) in reconstruction after excision of a choledochal cyst because of fewer complications such as adhesive bowel obstruction, anastomotic leakage and peptic ulcer. Apart for higher

postoperative reflux/gastritis it has a shorter hospital stay and similar operative benefits and outcome [11]. The utilization of HD for type IV Mirizzi's syndrome has also recently been reported [12]. Approximately 12% of patients undergoing surgery for symptomatic gallbladder stones will also have stones in the CBD [13]. It is appropriate that most patients with CBD stones are treated at the time of cholecystectomy. Thus the importance of performing intra-operative cholangiography during a cholecystectomy and exploring the CBD to retrieve any stone. The lack of fluoroscopy (image intensifier), fibreoptic instruments (choledoscope) or radiologically guided wire baskets or balloons in our setting did not make this possible. The operative hazards in blindly exploring the common bile duct for retrieving an impacted distal stone using a Desjardin (stone-grasping) forceps, or a Bake's dilator that can be passed down the CBD to allow division of the papilla and biliary sphincter in a transdudenal sphincteroplasty include damage to the biliary tree and the production of a false passage by overzealous instrumentation [14]. There is also the risk of damage to the hepatic artery or portal vein [1, 13]. A post- ERCP and sphincterotomy for retrieval of the impacted stone if available would have been useful in this case, but if it failed an open exploration is indicated (Figure 1) [1].Currently, the rational utilization of laser lithotripsy and an appropriate basket in laparoscopic common bile duct exploration (LCBDE) may avoid conversion to open procedures in patients with impacted CBD stones [3, 15]. Generally, the laparoscopic approach has the advantage for the patient over ERCP and sphincterotomy by being able to deal with the gallbladder and CBD stone/s simultaneously (i.e. laparoscopic cholecystectomy and laparoscopic intra-operative CBD exploration). This is corroborated by the fact that the standard treatment for symptomatic gallstones is laparoscopic and there are few exceptions to a trial of a laparoscopic approach. However, open bypass procedures such as a hepaticoduodenotomy may be an alternative to the traditional choledochoduodenostomy in the management of the retained, impacted distal CBD stone especially in the presence of sepsis and adhesions around the supraduodenal common bile duct and, in a low resource setting [16].

Declarations

Ethical statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee/s and wth the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient.

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Footnote

Reporting Checklist: The authors have complieted the CARE checklist

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16. Leckie PA, Schmidt N, Taylor R. Impacted common bile duct stones. The American J Surgery 1982;143(5):540-541**Legend**

Figure 1: Algorithm showing the available strategies for management of common bile duct stones (1) {with permission}

Figure 2: Schematic diagram of hepaticoduodenostomy

Failure

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`Fig1.pdf` available at https://authorea.com/users/352246/articles/484639-impacted-common-bile-duct-stone-managed-by-hepaticoduodenostomy-a-case-report