

CASE REPORT

Endobiliary Stent Migration Causing Ileal Perforation – A Case Report

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ABSTRACT

Common bile duct drainage (CBDD) following operative common bile duct exploration (CBDE) is routinely performed. Primary choledochotomy closure with trans-sphincteric endobiliary stent (EBS) is a popular technique. A 72-year-old woman presented with abdominal pain, peritonism, and sepsis a month after an elective right hemicolectomy with concurrent cholecystectomy and CBDE with EBS placement. Radiological investigations implied a detrimental consequence from migrated EBS. Surgical exploration revealed the cause to be ileal perforation by the EBS. She had a resection of the aggravated bowel segment and a double-barreled stoma was matured from the resected ends. The stoma was reversed 6 weeks after the laparotomy and the patient is currently under regular surveillance for colon cancer. Migration of EBS precipitating enteric perforation are uncommon, recognised complications. Natural, congenital, and acquired luminal and mural causes have been documented. Primary choledochotomy closure without CBDD, alternative EBS which are smaller or softer, and the utilization of T-Tube CBDD are valid options when treating patients with recognised increased risk of EBS-related bowel perforation.

Malaysian Journal of Medicine and Health Sciences (2022) 18(SUPP13):18-20. doi:10.47836/mjmhs18.s13.6

Keywords: Common bile duct drainage, Endobiliary stent, T-Tube, Bowel perforation, Common bile duct exploration

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INTRODUCTION

Common bile duct drainage (CBDD) following operative common bile duct exploration (CBDE) is routinely performed to reduce the risk of bile leak due to increased intraductal pressure caused by oedema, sludge, or retained bile duct stones. More recently, primary choledochotomy closure (PCC) with trans-sphincteric endobiliary stent (EBS) placement has gained popularity over the traditional T-tube CBDD, based on improved patient's convenience and reduced morbidity (1). The complication rate from the use of T-tube as CBDD could be more than 10% (1). However, the use of a stent does come with its own set of complications such as cholangitis, pancreatitis, stent fracture, stent occlusion, and stent migration. The complication rates observed are about 8-10% (2). This is a case report of a rare complication of EBS migration leading to ileal perforation.

CASE REPORT

We present a case of a 72-years old woman with severe right sided pain, abdominal distension, vomiting, and fever a month after her discharge from the hospital's surgical ward. The patient had an elective open right hemicolectomy for an ascending colon tumour with concurrent cholecystectomy and CBDE for choledocholithiasis a month prior to her current acute presentation. The decision for simultaneous surgery was made after a multidisciplinary team meeting as the patient was admitted several times with ascending cholangitis and the tumour was confirmed to be malignant. Numerous attempts to remove the impacted biliary duct stone endoscopically were futile. Subjecting the patient to separate surgeries may risk metastasis, delay in adjuvant treatment, or another severe episode of cholangitis. The treatment options and risks involved were counselled to the patient.

Routine prophylactic intravenous antibiotic (Cefipime and Metronidazole) was given prior to surgery commencement. The ascending colon tumour was removed first by the colorectal team. Colonic dissection

was routine without any complications nor spillage of bowel content. A side-to-side stapled anastomosis was created. The CBDE was performed by the hepatobiliary team. The impacted biliary stones were removed using Desjardin forceps. Biliary tree clearance was confirmed using choledoscopy. Direct visualisation of the proximal common hepatic ducts and the distal common biliary ducts (up to duodenum) were achieved. The PCC was closed using interrupted Polydioxone (PDS) 4/0 sutures and a straight plastic EBS (size 10F) was placed in situ as CBDD. A drain was placed at the gallbladder bed. Post-operative recovery was unremarkable, with the patient commencing oral intake on the day after surgery and discharged well 3 days after her operation.

The patient started experiencing right-sided abdominal pain five days prior to her presentation to the emergency department. The pain gradually worsened along with abdominal distension, bilious vomiting, and fever.

Apart from her multiple presentation with ascending cholangitis and two previous endoscopic retrograde cholangiopancreatography (ERCP) to relieve the bile duct obstruction, she does not have any other significant past medical or surgical history.

Clinically, the patient was dehydrated and in sepsis. She had a temperature of 37.8 °C. The abdomen was distended with generalised tenderness, and evidence of peritonism in the right lower abdomen. There was a vague mass in the right iliac fossa.

Full blood count showed leukocytosis (total white cell count 16x10⁹/L). Biochemistry tests revealed mild electrolyte derangement, with a blood urea nitrogen level of 7.5 mmol/L and a creatinine level of 101umol/L. All other blood parameters including coagulation profile and liver function test were within normal range.

Preliminary abdominal radiograph (Fig. 1) showed malposition of the EBS in the lower right abdomen leading to a suspicion of its migration. There was no evidence of extraluminal air on the erect chest radiograph nor the abdominal radiograph. Subsequent computed tomography scan of the abdomen confirmed the suspicion of a migrated EBS causing bowel perforation. The final diagnosis is small bowel perforation caused by migrated biliary stent.

An emergency laparotomy was performed. The EBS was visualized upon entering the peritoneal cavity (Fig. 2). Its failure to pass through the acute angle created by the side-to-side ileocolic anastomosis led to a perianastomotic ileal perforation by the proximal end of the stent. There was significant faecal contamination. Segmental resection was performed and the bowel ends were exteriorised as double barrel stoma. The patient's recovery was slow due to ileus, but she was tolerating oral feeds five days after the operation. The patient was discharged 2 weeks after her surgery.



Figure 1: Abdominal radiograph showing the endobiliary stent in the right lower quadrant of the abdomen, suggestive of migration



Figure 2: Exploratory laparotomy revealing the proximal end of the endobiliary stent perforating the perianastomotic ileum.

The patient's colon cancer final staging based on histopathological examination of the resected bowel was stage 2. Hence, adjuvant chemotherapy treatment was not necessary. She had her stoma reversed 6 weeks after her laparotomy. She is currently under regular surveillance for colon carcinoma.

DISCUSSION

The rationale for CBD drainage after CBDE was to allow for a path of least resistance for trans-sphincteric bile flow, hence avoiding bile leakage from PCC site. Post-operative biliary pressure can increase due to retained stone or sludge, or mucosal and papillary oedema (3). In the past, this was achieved by using T-tube drain placement prior to closure of the choledochotomy. However, several studies have shown that using an EBS with primary closure of the choledochotomy instead of a T-tube is as safe, resulting in shorter hospitalisation and less morbidity (3).

The use of EBS however brought its own set of complications. The EBS is a long, stiff, and narrow hollow plastic which prone to becoming stuck at luminal narrowings and mural abnormalities (4). These include natural fixity of a bowel segment (such as duodenum and colonic hepatic flexure), congenital bands, adhesions, abdominal wall hernias, and surgical visceral reconfiguration such as the patient's side-to-side ileocolic anastomosis along with intramural bowel abnormalities such as diverticulosis, strictures, and tumours. Migration of EBS is well documented and occurs at the rate of about 6% (2). However, bowel perforation caused by a migrated EBS is rare and account for less than 1% of EBS complications (4). The type and calibre of EBS also influence the risk of migration, thus risk of bowel perforation. Straight plastic stent and 10F sized stents are more prone to migrate (2).

The patient had dual pathology which were judged to be amenable for surgical therapy concurrently via a laparotomy. While the chief indication was her cancer, cholecystectomy and CBDE at a later date would not be the ideal scenario for the patient. She has had repeated admissions due to the complication from the choledocholithiasis. The risk of cholangitis during her post-operative period was high. In addition, a later elective date for cholecystectomy and CBDE, or another episode of cholangitis will delay her adjuvant therapy hence risking her cancer survival. CBDD with EBS was chosen for its familiarity by the operating team and was hoped to minimize the risk of bile leak from the PCC site.

The choice of CBDD with EBS in this case was made after some perioperative considerations. The rate of adverse outcomes with EBS is low overall. However, in hindsight, perhaps other options could be given extra deliberations. Primary closure of choledochotomy after

CBDE without an indwelling stent has been proven to be a safe option (1). However, a few criteria must be fulfilled. The surgeon must be proficient with choledochotomy closure and has excellent CBD clearance rate. Post CBD clearance cholangiogram is mandatory to show complete clearance and there should not be any delay in contrast flow to the duodenum. Finally, a primary closure without an EBS can be considered if less than 5 stones were removed or the CBDE was performed in patients without active cholangitis (1,3). If the expertise is lacking, or an EBS is required, the choice of stent can be considered. Size 7 Fr pigtail stent or an infant feeding catheter (size 8 or 10 Fr) have been shown to be safe alternatives and lack the rigidity to puncture bowel wall (2,5). Finally, the time-honored T-tube CBDD should not be overlooked. It has been the standard insurance policy adopted after CBDE in the past and has been used as the rescue option should problems encountered after primary closure of CBD, with or without an EBS (1). Selective use of T-tube should be considered if the benefit outweighs the possible morbidity encountered in cases such as the one presented here.

CONCLUSION

Careful considerations should be given pertaining to the modality of CBDD after CBDE. EBS is a good popular low risk form of biliary decompression. EBS migration and enteric perforation are recognised uncommon complication from EBS placement following CBDE. Natural, congenital, and acquired luminal and mural causes of migrated EBS enteric impingement have been documented. PCC without CBDD in ideal CBDE cases, alternative EBS which are smaller or softer, and the utilization of T-Tube CBDD are valid options.

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