



Case report

Duodenal perforation due to migrated biliary stent: Case report



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ABSTRACT

Introduction: Biliary stents are frequently associated with various complications; however biliary stent migration causing duodenal perforation is rare and has only been reported in few cases.

Presentation of case: We present a case of 33 years old male with pain abdomen and fever for 2 days came to Emergency department. He had undergone open common bile duct exploration (CBD), clearance of stone and placement of CBD stent. In X-ray abdomen, biliary stent migration was suspected. CECT abdomen was done for the confirmation of diagnosis which showed migrated stent with duodenal perforation. Patient underwent exploratory laparotomy and Thal patch repair, pyloric exclusion, retrograde duodenostomy and feeding jejunostomy. Post-operative period was uneventful.

Discussion: Biliary stents are used to relieve biliary obstruction. There is increasing use of endoscopic retrograde drainage via plastic endoprosthesis and so the related morbidities. One of the rare but serious complications is intestinal perforation and duodenal perforation is seen in most of the cases, explanation being the relative fixed position of the duodenum.

Conclusion: Although intestinal perforation is an uncommon complication following CBD stenting, we should suspect it in patients presenting with pain and fever.

1. Introduction

Biliary stents are used to treat bile duct obstruction either due to malignant or benign strictures, or choledocholithiasis. By improving biliary drainage, stents help in relieving symptoms like jaundice, pruritus and pain as well as improves liver function parameters. Cholecystojejunostomy and choledochojejunostomy were the primary surgical modalities for treatment of biliary obstruction previously. In early 1980s use of endoscopic placement of biliary stent was done [1]. In both distal and hilar malignant obstructions palliative endoscopic stent placement is useful [2]. Endoscopic placement of biliary stents may be complicated by stent occlusion, potentially leading to cholangitis. In addition, plastic stent migration is regularly encountered.

Although the majority of migrated stents pass spontaneously in stool or can be retrieved using endoscopy and fluoroscopy, few of them can cause perforation and peritonitis necessitating an emergency laparotomy. The work has been reported in line with the SCARE criteria [3].

2. Case report

A 33 years' old male presented in Emergency Department, Tribhuvan University Teaching Hospital with complaints of pain abdomen for 2 days associated with bilious vomiting. He had undergone open CBD exploration with cholecystectomy and biliary stent placement for choledocholithiasis as well as primary repair of umbilical hernia 2 months back. There was no history of jaundice or other known co-morbidities. One year back, he underwent ERCP, extraction of CBD stone and stenting for choledocholithiasis but he was lost follow up since 1 year due to Covid-19 pandemic. He later visited our center after 1 year for stent exchange and he was planned for open CBD exploration. Just 1 day prior to his scheduled follow up at OPD, he presented to our emergency department. On examination, he was febrile. Per abdominal examination revealed generalized guarding and rigidity, more on left iliac fossa and rebound tenderness was also present. Routine blood investigations and further work up was done.

Laboratory examination showed hematocrit 45.9 %; white blood cell count 10,900/cm³; platelets 249,000/cm³; sodium 142 mEq/L;

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Fig. 1. X-ray showing migrated biliary stent.

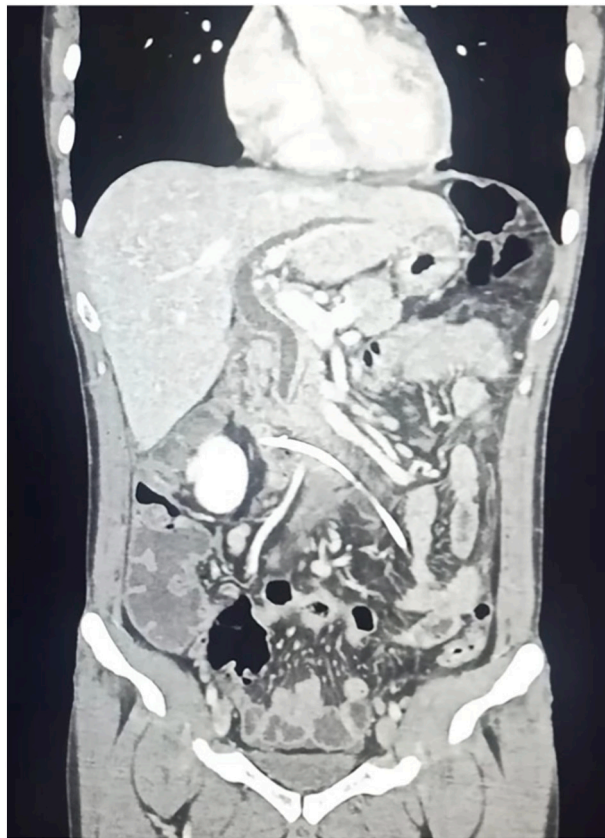


Fig. 2. CECT abdomen showing stent penetrating 3rd part of the duodenum (D3) into the peritoneal cavity.

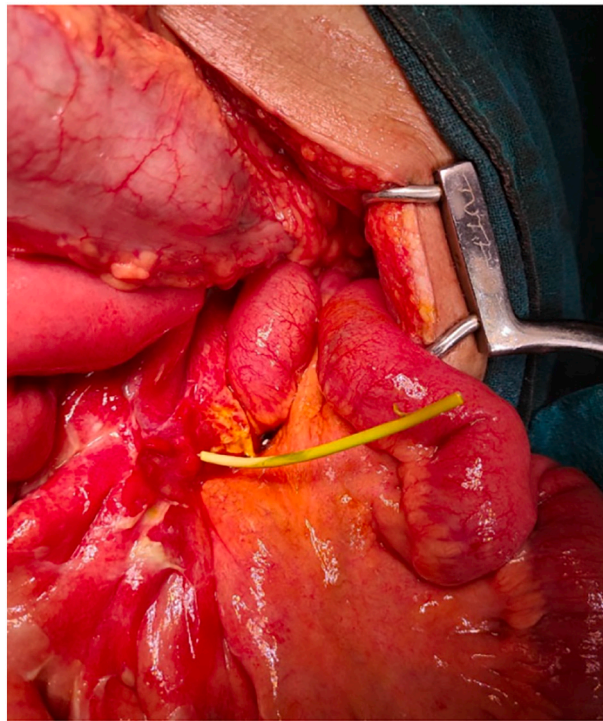


Fig. 3. Stent protruding from the perforation of D2-D3.

potassium 3.9 mEq/L; blood urea nitrogen 5.5 mmol/l; creatinine 83 $\mu\text{mol/L}$; RBS 8 mol/l; lipase 27.5 IU/L; total bilirubin 22 $\mu\text{mol/L}$ direct bilirubin 11 $\mu\text{mol/L}$; SGPT 80 U/L; ALP 125 U/L. USG abdomen showed CBD diameter of 5.4 mm with normal bilateral IHBD caliber however distal CBD not visualized.

X-ray abdomen (Fig. 1) revealed stent displaced more distally and no free gas was seen under the diaphragm. USG abdomen showed dilated CBD and mild dilatation of intrahepatic bile duct. Contrast Enhanced CT abdomen and pelvis (Fig. 2) also showed stent penetrating 3rd part of the duodenum (D3) into the peritoneal cavity. He underwent exploratory laparotomy. Intra-operative findings confirmed approximately 1×0.5 cm perforation at duodenum (D3-D4 junction) with purulent pelvic collection of about 100 ml with stent tip protruding from the

defect (Fig. 3). The patient underwent Thal's patch repair of perforation (Fig. 4), pyloric exclusion, gastrojejunostomy, feeding Jejunostomy and retrograde tube duodenostomy (Fig. 5).

Post-operatively, the patient experienced good overall recovery. He was discharged on 9th postoperative day without any complication.

3. Discussion

Biliary stents are used to relieve biliary obstruction. Biliary obstruction can occur from both malignant and benign conditions including pancreatic cancer, cholangiocarcinoma, metastatic disease, chronic pancreatitis, choledocholithiasis, and postoperative strictures. Various factors related to patients as well as stents determine biliary

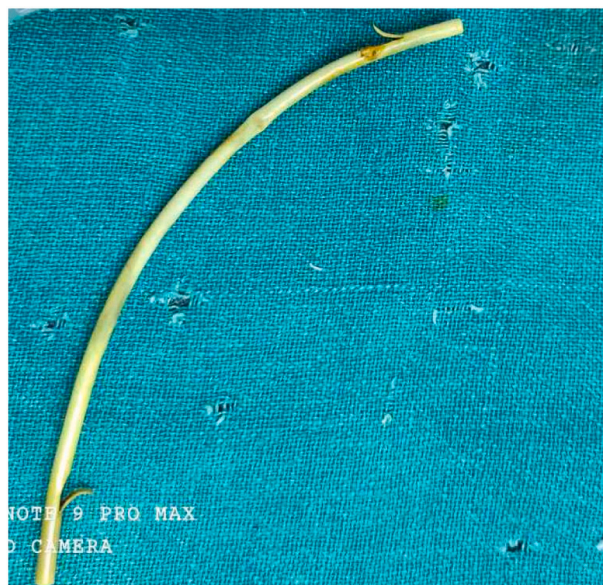


Fig. 4. Retrieved stent.



Fig. 5. Feeding jejunostomy and retrograde tube duodenostomy.

migration.

In general, treatment options for the biliary obstruction may be surgery, percutaneous transhepatic biliary drainage and endoscopic or percutaneous placement of a plastic or metallic stent. Surgery can be palliative or therapeutic, however with considerable morbidity or mortality [4]. Similarly, in percutaneous transhepatic approach the complication rate is higher [5]. Nowadays, there is increasing use of endoscopic retrograde drainage via plastic endoprosthesis and so the related morbidities. One of the rare but serious complications is intestinal perforation and duodenal perforation is seen in most of the cases, explanation being the relative fixed position of the duodenum. Diverticula, abdominal wall hernias and adhesions are some risk factors [6].

CBD stone removal fails 5–10 % of the time after ERCP, even after the use of lithotripsy or large balloon dilatation technique. If these techniques fail or if an alternative to these approaches is needed, a stent may be an option. The stent can help in drainage of bile and stone dissolution, which can result in eventual successful endoscopic stone removal [7]. Migration is a common complication with plastic stents. Five percent of plastic stents, 1 % of pcSEMS, and 35 % of fully covered stents have been shown to migrate [8]. Migration may be proximal i.e. into the duct or distal i.e. out of the duct with later accounting for up to 6 % of the inserted biliary duct stents. Papillary stenosis appears as a risk factor for the distal migration of the biliary stent [6,9]. Fortunately, cases of intestinal perforation due to migrated stent are seen in less than 1 %. Many cases of bowel perforation including duodenum, jejunum, ileum, caecum or colon has been reported, however most common site of perforation is duodenum. Migrated stent may cause intramural or transmural intestinal perforation. In duodenum, the perforation is usually retroperitoneal causing bilioma and if other parts of bowels like jejunum and ileum are included may cause peritonitis [10]. In our case the migrated stent caused duodenal perforation and peritonitis. Most of the migrated biliary stent pass spontaneously. If not so, various intervention options include percutaneous extraction, endoscopic extraction of stent with clip closure of the perforation and operative extraction [10–12].

4. Conclusion

Patients with biliary stent insertion may present with perforation of the bowel, necessitates suspicion in patients who had had CBD stenting. It is possible to diagnose and localize stent migration or other complications radiologically using X-ray or CT scan. Risk factors like previous surgery, adhesions or abdominal wall hernia should always be looked for.

Surgical extraction of the stent and repair of perforation is one of the choices of treatment.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

The study is exempt from ethical approval in our institution.

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Guarantor

Dr Prarthana Pachhai, MS resident.

Research registration number

This is a case report so it does not require registration.

CRedit authorship contribution statement

Full name of authors	Research concept	Research design	Literature review	Data collection	Data analysis	Statistical analysis	Manuscript preparation
Prarthana Pachhai	✓	✓	✓	✓	✓	✓	✓
Rabi Khadka	✓	✓	✓	✗	✓	✓	✗
Deepak Sharma	✓	✓	✓	✗	✓	✓	✗
Narendra Maharjan	✓	✓	✓	✗	✓	✓	✗
Ramesh Singh Bhandari	✓	✓	✗	✗	✗	✗	✗

Declaration of competing interest

None.

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