Unexpected outcome (positive or negative) including adverse drug reactions

Biliary stent migration presenting with leg pain

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Summary

Although the therapeutic benefits of endoscopic retrograde cholangiopancreatography (ERCP) usually outweigh the risks, there can be rare complications, including stent migration leading to perforation, intestinal obstruction or penetration. An 87-year-old woman presented with symptomatic choledocholithiasis. Two previous endoscopic attempts at stone removal were unsuccessful. On repeat ERCP at our institution, multiple large stones were removed, but complete duct clearance could not be achieved. A plastic biliary stent was placed with plans to reattempt in 6 weeks. Postoperatively, she had mild back pain radiating into her right leg that gradually worsened to the point where she was unable to ambulate. An abdominal CT scan showed the distal aspect of the biliary stent extending through the wall of the duodenum with the tip positioned within the right psoas muscle. The stent was successfully removed via a rat-toothed forceps. Our case illustrates an extremely rare complication of biliary stent placement.

BACKGROUND

Endoscopic retrograde cholangiopancreatography (ERCP) has a multitude of diagnostic and therapeutic benefits. As research progresses, the use and indications of ERCP are likely to advance. However, despite its clear benefit, ERCP carries with it several known and accepted complications that fit anywhere on the severity spectrum from minor to life-threatening. In most instances, the therapeutic benefits of ERCP outweigh these risk factors. Despite a wealth of information in the literature, there are still abnormal complications that could remain unrecognised if not for a high index of suspicion. One such complication associated with ERCP and biliary stent placement is stent migration leading to perforation, intestinal obstruction or penetration. We hereby present a case of biliary stent penetration through the small bowel and into the iliopsoas muscle that was successfully treated endoscopically.

CASE PRESENTATION

An 87-year-old woman with a history of diverticulitis and a remote history of cholecystectomy presented to an outside hospital with symptomatic choledocholithiasis. Her medical history was significant for a previous right nephrectomy for leiomyosarcoma. A CT scan of the abdomen revealed extensive common bile duct stones, but no other abnormalities. Two previous endoscopic attempts at stone removal were unsuccessful due to an extrinsic duodenal stenosis that was related to her previous retroperitoneal surgery. She was then referred to our centre.

TREATMENT

After dilation of the area and advancement through the stenotic area using a balloon traction technique with a CRE™ 12–15 mm balloon (Boston Scientific, Natick, Massachusetts, USA), a duodenoscope with an 11.3 mm outer diameter was successfully navigated to the area of the papilla. The major papilla was found in proximity to the stenotic portion making the procedure especially challenging. Multiple large stones

were removed in a conventional fashion but complete duct clearance could not be achieved given the large size of the residual stones. An 8.5 F×15 cm Cotton Huibregste plastic biliary stent was placed to facilitate biliary drainage. Plans were made to recall her in 6 weeks for a reattempt with a therapeutic duodenoscope which would permit cholangioscopic directed electrohydraulic lithotripsy. She did well postprocedure. However, a few days postoperatively, she began to notice a mild pain in her back that travelled down through her hip and into her right leg. This pain gradually worsened to the point where she was unable to ambulate. Hip flexion resulted in increased pain, and she was subsequently readmitted. In the hospital she also complained of nausea and vomiting that was thought to be biliary in cause. She denied any fever or abdominal pain and her bowel movements were regular after undergoing a bowel regimen for constipation 2–3 weeks back. An abdominal CT scan showed the distal aspect of the biliary stent extending through the wall of the duodenum with the tip positioned within the right psoas muscle (figures 1–4). There was no surrounding collection in the psoas muscle. There was still evidence of extensive stone disease within the biliary tree and mild intrahepatic biliary dilation. After a careful review of the risks and benefits of surgical versus endoscopic intervention, our surgical consultant felt our patient was a poor operable candidate due to her comorbidities and thus we elected to proceed endoscopically (figure 5). The stent was removed via a rat-toothed forceps.

OUTCOME AND FOLLOW-UP

Initially, she did very well. Unfortunately, the patient presented 1 week later with haematochezia. She was haemodynamically unstable and was managed in the ICU. The family decided to make the patient comfort care only, and thus the source of bleeding was never evaluated despite our clear interest to further investigate its aetiology. The patient passed away within 48 h of presentation to the hospital.

Figure 1 Scout film: CT abdomen showing the entire pathway of the biliary stent.

DISCUSSION

Despite its clear benefits, there is always the risk of complications with invasive procedures like ERCP. Advanced endoscopists should be able to recognise and convey these risks and their probabilities to their patients. There are reproducible complication rates that are found in the literature which include a cumulative risk rate of 5–10% of cases; haemorrhage in 2–3%, pancreatitis in 1–4%, cholangitis in 1–3% and retroduodenal perforation in $\leq 1\%$, and an overall mortality of 0.5–1%.¹ A multivariate analysis by Cotton *et al*,² which included 11 497 ERCP procedures, found 462 complications (4.0%), of which 42 were severe (0.36%), and 7 were fatal (0.06%). The risk of pancreatitis was found to be 2.6% and bleeding was 0.3%. Nearly all the bowel perforations (1.3% vs 0.1%) occurred in patients with previous biliary diversions such as a Billroth II gastrectomy, Roux-en-Y diversion, or a Whipple procedure.² In general, there are known risk factors that increase the likelihood of these complications, including suspected sphincter of Oddi dysfunction, percutaneous

Figure 3 Coronal view: CT abdomen showing the biliary stent tracking down through the bowel.

biliary access, cirrhosis, difficult cannulation of the papilla, a pre-cut sphincterotomy and an endoscopist with a low ERCP case volume.³

Internal drainage of the biliary tract by placement of an endoprosthesis via ERCP is a well-established treatment option for biliary tract obstruction. This method is preferred over surgical drainage because of its significantly lower complication rate.² However, ERCP with biliary stent placement has well-known complications such as cholangitis, cholecystitis, pancreatitis, bile duct erosion and mechanical complications related to stents. Mechanical complications include stent occlusion, stent fracture and stent migration leading to perforation, intestinal obstruction or penetration. Although these complications range from mild to severe and even life-threatening, they are usually accepted because of the great therapeutic potential of the procedure.

Migration of plastic biliary stents is reported in 4.9% of cases for proximal migration and 5.9% for distal

Figure 2 Sagittal view: CT abdomen showing penetration of the biliary stent into the psoas muscle.

Figure 4 Coronal view: CT abdomen showing penetration of the biliary stent into the psoas muscle.

Figure 5 Endoscopic image showing perforation of the biliary stent through the duodenal wall.

migration.¹ Usually, stents that migrate distally do not cause complications and are expelled in stool. Endoscopic methods of migrated stent retrieval (snare or baskets) and replacement provide successful treatment in the majority of cases.¹ The complication that causes concern to most clinicians is bowel perforation. High suspicion and early diagnosis of a procedure-related perforation can be facilitated greatly by clinical findings (pain or fever) and radiographic imaging with contrast such as a CT scan or MRI. The literature suggests that papillary stenosis, intraabdominal adhesions, diverticulosis, local anatomical variations, any prior abdominal surgery and radiation and other conditions associated with altered bowel motility can hinder the passage of a distal migrated stent and increase the risk of mechanical complications.^{4–7} Our patient had many of these risk factors.

Penetration of migrated biliary stents, as described in this case, typically occurs in situations where the affected intestine is attached to a surrounding structure. Typically, this leads to a contained extra-abdominal collection, internal or external fistula instead of a diffuse peritonitis or intraabdominal abscess. Cases from prior publications include penetration into the pancreas, enterocutaneous, bilioenteric, colocolic, colovesical and duodenocolic fistulas.^{4–7} The management approach in this type of mechanical complication is dictated by the severity of the situation and may include early endoscopic or percutaneous removal. Losenoff *et al*⁸ described the only reported case to date of a biliary stent penetration through the small bowel and into the iliopsoas muscle. In that case, the stent was

removed percutaneously. As previously mentioned, we were successful in endoscopically removing the biliary stent that was penetrating the duodenum and iliopsoas muscle. Our case illustrates an extremely rare complication of biliary stent placement and clearly highlights the essential need to have a high index of suspicion for post-ERCP stent placement complications, especially if they present with such atypical symptoms as our patient with leg pain.

Learning points

- ▶ Although the therapeutic benefits of endoscopic retrograde cholangiopancreatography (ERCP) usually outweigh the risks, there can be rare complications, including stent migration leading to perforation, intestinal obstruction or penetration.
- ▶ Our case illustrates an extremely rare complication of biliary stent placement, in which the biliary stent penetrated through the small bowel and into the iliopsoas muscle.
- ▶ There should be a high index of suspicion for post-ERCP stent placement complications, especially if they present with atypical symptoms.

Competing interests None.

Patient consent Obtained.

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