Reminder of important clinical lesson

Duodenal perforation secondary to migration of endobiliary prosthesis

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Summary

A 27-year-old woman presented to the emergency department with abdominal pain, four days post endoscopic retrograde cholangiopancreatography (ERCP) and insertion of an endobiliary stent. A plain abdominal film highlighted the stent in an atypical position within the abdomen. As such, the patient progressed to a CT scan, confirming a retroperitoneal perforation of the duodenum by the stent. Laparotomy returned the stent to the duodenum with a primary duodenal repair. This case highlights the high index of suspicion required in patients who present with acute abdominal pain post-ERCP.

BACKGROUND

In patients presenting with abdominal pain secondary to visceral perforation, the absence of subdiaphragmatic air does not exclude a diagnosis of perforation. In addition, posterior perforation of the duodenum by the stent is a rare complication of endoscopic retrograde cholangiopancreatography (ERCP). Given this, it is prudent that in any patient that presents acutely following ERCP then complications of ERCP must first be excluded.

CASE PRESENTATION

This 27-year-old woman presented to the emergency department with a 4-day history of upper abdominal pain following ERCP. This patient had a history of weight loss and jaundice leading to the discovery of a stricture at the confluence of the right and left hepatic ducts. ERCP was performed in order to achieve biliary decompression and to retrieve endothelial cells for pathological analysis. During this procedure a 12 cm seven French straight plastic stent was deployed into the right ductal system. No sphincterotomy or trawl was required at this time and there were no immediate postprocedure complications reported.

Clinical observations were in keeping with sepsis, showing a tachycardia, relative hypotension and fever. Clinical examination of her abdomen revealed tenderness in all four quadrants, with peritonism in the right iliac fossa.

INVESTIGATIONS

Biochemical and haematological investigations revealed a leucocytosis and obstructive liver function tests (LFT's) with a bilirubin of 64 $\mu\text{mol/L}$, alkaline phosphatase 398 U/L, γ -glutamyl transpeptidase (GT 148 U/L and a normal amylase. This was in contrast to LFT's pre-ERCP (bilirubin 171 $\mu\text{mol/L}$, alkaline phosphatase 430 U/L and gamma GT 150 U/L) with immediate post-ERCP bloods not performed. Chest radiograph did not reveal a pneumoperitoneum. At this point, however, there were some concerns raised on viewing the plain abdominal film that the biliary stent was not in the territory of the duodenum. A

CT scan of the abdomen revealed a large volume of free fluid with no pneumoperitoneum. The biliary stent appeared to lie between two thickened loops of small bowel with the overall appearances consistent with stent migration through the duodenal wall (figure 1).

TREATMENT

Laparotomy revealed a large amount of clear bile within the peritoneal cavity. Following Kocherisation of the duodenum the stent was found to have perforated posteriorly in the region of the third portion of the duodenum (D3; figure 2). The stent had migrated through the transverse mesocolon in the area of the hepatic flexure but no injury of the colon or mesentery was observed. The distal aspect of the stent was divided and the stent was returned to the duodenum followed by a primary repair of the duodenotomy and omental patch.

OUTCOME AND FOLLOW-UP

The indication for the insertion of this patient's stent was to relieve biliary decompression secondary to a stricture at

Figure 1 CT scan of the abdomen demonstrating extraluminal biliary stent (arrow) and bilious-free fluid (asterix).

Figure 2 Intraoperative photograph demonstrating perforating biliary stent (arrow) exiting the duodenum (A) and passing distally under the colon (B) to perforate the mesocolon.

the confluence of the right and left hepatic ducts. Endothelial cells were taken for pathological analysis, and revealed no malignant cells or atypia. Postoperative recovery was uneventful and discharge followed on the third postoperative day. Longer-term follow-up of this patient's case has repeatedly shown no evidence of malignancy. ERCP with spyglass was undertaken showing a tight fibrotic stricture of the proximal duct. A putative diagnosis of ischaemic cholangiopathy has been made with the patient now referred for liver transplant.

DISCUSSION

ERCP with biliary stent insertion is a well-recognised treatment for the management of biliary tree obstruction secondary to malignant and benign disease. By far, the most common complication recognised with an incidence ranging from 1% to 7% is ERCP-induced pancreatitis.^{1–5}

Perforation, while recognised as a potential complication of ERCP is less common ranging from 0.3% to 0.6%,^{1–6} yet has mortality as high as 18%.⁷

Perforations are classified into the following categories:

- ▶ Type I: Lateral or medial duodenal wall distant from the ampulla.
- ▶ Type II: Peri-Vaterian.
- ▶ Type III: Bile duct.
- ▶ Type IV: Retroperitoneal.

Colonic or duodenal perforation secondary to a stent migration is extremely rare and few cases have been reported.^{8–11} Recent reviews of biliary stent placement have shown migration rates of 13.4% with stents being found equally in proximal and distal sections of the gastrointestinal tract.¹² In the subject of this case report, the stent had not completely left the bile duct thus providing a position of anchorage. It was believed that this, in combination with the long-length and rigidity of the stent, led to sustained local pressure on D3 resulting in the perforation.

If perforation of a migrated stent occurs, the duodenum is the most probable site of perforation the majority occurring retroperitoneally.^{13–15} No particular type or size of biliary stent currently in use has been implication in a higher perforation rate.

Our patient presented clinically with evidence of severe sepsis, and an acute abdomen. There was no evidence of a pneumoperitoneum on erect chest x-ray. This should not deter the junior surgeon from suspecting a perforation and a high index of suspicion should always be maintained. This suspicion is heightened further should the patient have recently undergone ERCP.

Learning points

- ▶ Perforation of the duodenum secondary to endobiliary stents is a rare complication of endoscopic retrograde cholangiopancreatography (ERCP).
- ▶ Abdominal pain/peritonism in patients with stent placement mandates further investigation, to exclude perforation.
- ▶ The absence of pneumoperitoneum in patients post-ERCP with acute abdomen does not refute a perforation.
- ▶ CT scan is the investigation of choice in these patients.
- ▶ Aggressive surgical intervention provides the highest chance for successful outcome, once duodenal perforation has been established.

Competing interests None.

Patient consent Obtained.

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