Cholecystocolonic fistula: an unusual cause of large bowel obstruction

Introduction

Gall-stone ileus is an uncommon entity, first described by Bartholin in 1654 (Kirchmayr et al, 2005). It is a form of mechanical obstruction caused by impaction of one or more gall-stones, which enter the small or large bowel via a fistulous communication between the gall bladder and bowel wall. Despite tremendous improvement in perioperative management, morbidity and mortality of this condition remains high because:

1. Older patients are commonly affected
2. There are often multiple associated co-morbidities
3. Presentation to hospital is often delayed
4. There is associated dehydration and electrolyte imbalance
5. There is often difficulty in reaching a diagnosis (Soto et al, 2001).

This article describes a case of large bowel obstruction secondary to impaction of a large gall-stone in the sigmoid colon.

Discussion

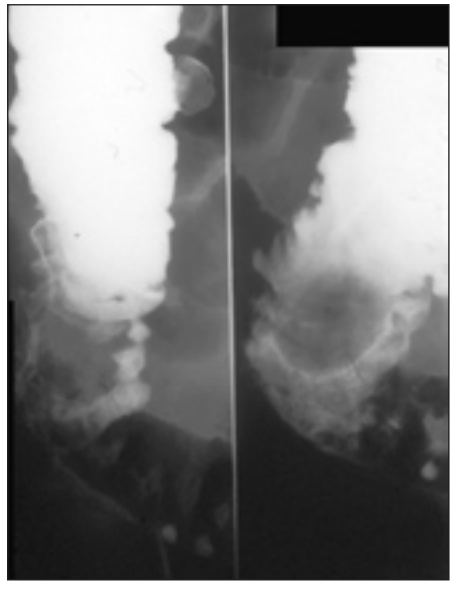
Gall-stone obstruction of the large bowel is a rare condition, accounting for just 4% of all cases of gall-stone ileus. The most common site of obstruction is the middle and lower third of the ileum (61%) followed by the jejunum (16%), stomach (14%), duodenum (4%) and colon (4%). Only 1% of stones pass without obstruction (Lübbers et al, 1999). The obstructing stone is usually more than 2 cm in diameter in the normal bowel (Ishikura et al, 2005).

Figure 1. Plain abdominal X-ray showing pneumobilia, dilated small and large bowel loops.

The most common site of impaction in the large bowel is the sigmoid colon, sometimes associated with concomitant obstructive diseases like diverticular disease, malignancy or radiation stricture (Lübbers et al, 1999; O'Donoghue et al, 2003; Ishikura et al, 2005). Approximately 50% of patients suffering from gall-stone ileus have a history of gall bladder disease, either acute or chronic cholecystitis. The inflammation and adhesion facilitate the erosion of the stone through the gall bladder wall, forming a cholecystoenteric fistula (Kirchmayr et al, 2005).

The duodenum is the most commonly involved site of the gastrointestinal tract in cholecystoenteric fistulae, accounting for

Figure 2. An unprepared barium enema showed a large smooth filling defect in sigmoid colon.



Case Report

A 70-year-old woman was admitted to the emergency department with a 2-week history of pain in the upper abdomen, vomiting, fever and jaundice. She was also complaining of pale stool and dark urine. Subsequently she developed abdominal distension with colicky pain and absolute constipation. There was no history of previous biliary symptoms. On examination she was pale and tachycardic with a fever of 37.9°C. Abdominal examination revealed generalized abdominal distension with a tender mass at right upper quadrant and hyperactive bowel sounds on auscultation. Laboratory examination showed a white blood cell count of 15 600/mm^3 (neutrophil 85%), bilirubin of 47μmol/litre, alkaline phosphatase of 220 U/litre with normal liver enzymes and amylase. Plain abdominal X-ray demonstrated pneumobilia and dilated small and large bowel loops suggestive of intestinal obstruction (*Figure 1*). An unprepared barium enema showed a large smooth filling defect in sigmoid colon with large bowel obstruction (*Figure 2*). A diagnosis of large bowel obstruction presumably caused by a gall-stone was made. Surgical treatment followed a period of physiological optimization.

At laparotomy the abnormalities were large bowel obstruction caused by an impacted gall-stone in a section of sigmoid diverticular disease plus right upper quadrant mass. A sigmoid colectomy with removal of diverticular disease and the stone, then a primary anastomosis was performed. Exploration of right upper quadrant mass revealed an inflamed friable gall bladder with a fistula between its fundus and the transverse colon. A partial cholecystectomy was performed, the cystic duct closed in-situ and the defect in transverse colon was brought out as a loop colostomy. Her postoperative course was uneventful. Closure of colostomy was performed 3 months later and she made a full recovery.

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approximately 75% of these communications. The commonest site of colon fistulation is the hepatic flexure and in these patients larger stones may impact in the sigmoid colon – the narrowest portion of the large bowel (Mittendorf et al, 2003).

In most patients with colonic obstruction symptoms develop more slowly and predominant features are colicky abdominal pain and distension. These patients can also present with choleric enteropathy, an infrequent complication manifested with severe diarrhoea (Mittendorf et al, 2003). Plain abdominal radiograph shows pneumobilia (75% of cases), evidence of partial or complete intestinal obstruction and sometimes an aberrantly located gall-stone. Contrast imaging is helpful in delineating the fistulous communication and locating the level of obstruction. Computed tomography (CT) studies of the intestine may show pneumobilia, signs of intestinal obstruction or an ectopic gall-stone at the site of impaction (O'Donoghue et al, 2003).

While urgent relief of obstruction is essential, the place of concomitant cholecystectomy and repair of fistula is debatable. Cholecystectomy in these patients is technically difficult owing to the presence of dense pericholecystic adhesions, adhesions at Calot's triangle and associated biliary enteric fistula. Partial or subtotal cholecystectomy may be the only feasible surgical option. The whole bowel should be scrutinized for additional gall-stones, as 10–40% of patients have multiple enteric stones (Milsom and MacKeigan, 1985). A one-stage procedure involving enterolithotomy, cholecystectomy and removal of fistula is associated with a higher mortality, but the incidence of cholangitis can be as high as 11% after enterolithotomy alone (Kirchmayr et al, 2005). The precise choice of operative approach depends on the risk associated with individual patients. A minimalist approach is recommended in elderly patients with associated co-morbidities (O'Donoghue et al, 2003; Anagnostopoulos et al, 2004).

Conclusions

Although colonic gall-stone ileus is rare, it is an important differential diagnosis of large bowel obstruction especially in elderly patients with a history of gall-stone disease. Plain radiography, contrast studies, ultrasonography and CT are helpful in establishing the diagnosis preoperatively. Urgent relief of obstruction should be the primary goal, with definitive fistula surgery depending on the risks and benefits associated with an individual patient. BJHM

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Pneumoperitoneum on abdominal X-ray

A 60-year-old woman with known cirrhosis and ascites presented with a 1-week history of back pain and being generally unwell. On examination abdomen was soft and only minimally tender. An erect chest X-ray showed no free peritoneal gas. On abdominal X-ray there was an abnormal gas shadow over the right upper quadrant and a small triangle of gas within the pelvis, suggesting free peritoneal air. A perforation was confirmed by computed tomography. Because of her poor general condition the patient was managed conservatively and unfortunately died a few days later.

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Approximately half of patients with a pneumoperitoneum will have free gas detectable on a supine abdominal radiograph and half of these will have a collection in the right upper quadrant adjacent to the liver, mainly in the subhepatic space and the hepatorenal fossa (Morrison's pouch). Triangular collections of gas between loops of bowel may sometimes be identified and are a valuable sign of pneumoperitoneum (Field and Morrison, 2003). BJHM

Field S, Morrison I (2003) The acute abdomen. In: Sutton D, ed. *Textbook of Radiology and Imaging*. 7th edn. Churchill Livingstone, New York: 665–6

Figure 1. Abdominal X-ray showing an abnormal gas shadow over the right upper quadrant (small arrows) and a small triangle of air within the pelvis (large arrow).