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CASE OF THE MONTH

An 85-year-old male with abdominal pain and previous gastric surgery

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An 85-year-old Caucasian male presented as an emergency to hospital with a 3-week history of increasing colicky abdominal pain, anorexia and constipation. He had undergone an operation for peptic ulcer disease over 30 years previously.

On examination the patient had a distended abdomen, which was tympanic to percussion. An upper midline laparotomy scar was apparent. A clinical diagnosis of small bowel obstruction was made. A CT scan of the abdomen and pelvis was requested.

Selected images of the portal venous phase CT examination of the abdomen and pelvis with oral and intravenous contrast are shown in [Figure 1](#). What do they demonstrate? What is the differential diagnosis?

CT FINDINGS

The CT images demonstrate a distended small bowel with a segment of thickened, hypervascular small bowel with flecks of gas within the wall (arrows in [Figure 1a](#)). Just distal to the thickened

bowel segment is a region of soft tissue density within the bowel lumen, which contains a thin curvilinear calcific density (arrow in [Figure 1b](#) and arrowhead in [Figure 1c](#)). The small and large bowel distal to this point are not distended. The liver and gallbladder (arrow in [Figure 1d](#)) are normal. A previous Roux-en-Y small bowel to small bowel anastomosis was also noted (not fully demonstrated—arrow in [Figure 1c](#) represents site of jejunojejunostomy).

LAPAROTOMY FINDINGS AND DIAGNOSIS

Distal small bowel obstruction was confirmed at laparotomy with mural thickening of the small bowel proximal to the point of obstruction. A previous distal gastrectomy and Roux-en-Y reconstruction was noted. All other intra-abdominal organs were normal.

A foreign body was located at the site of small bowel obstruction and an enterotomy made, which revealed a large calculus ([Figure 2](#)). The gallbladder was re-examined and found to be distended, with

Figure 1. Selected coronal, axial and sagittal images from a portal venous phase study of the abdomen and pelvis. (a) Thickened segment of distended small bowel with intramural gas (arrows), (b) intraluminal curvilinear focus of calcification (arrow), (c) intraluminal focus of calcification (arrowhead) and site of jejunojunctionostomy (arrow), (d) normal gallbladder (arrow).

no evidence of cholecystenteric fistulation. The diagnosis of enterolith ileus was made, with the enterolith having formed in the blind jejunal loop of the previous Roux-en-Y reconstruction.

DISCUSSION

The main differential diagnosis in this case is of gallstone ileus. Gallstone ileus is an uncommon cause of intestinal obstruction in which the commonest underlying mechanism is that of chronic cholecystitis causing a cholecystenteric fistula. The most common type of fistula is a choledochoduodenal fistula [1]. The diagnosis may be made on pre-operative CT scan, with the classic findings being small bowel obstruction, pneumobilia and an aberrant gallstone at the site of obstruction (so-called “Rigler’s triad”). Often less than three of these findings are seen, and the presence of two out of three findings (seen in 40–50% of cases) is generally considered pathognomonic [2].

This case is an example of enterolith ileus, the diagnosis of gallstone ileus being rejected due to the distended gallbladder seen at laparotomy, consistent with an absence of a choledochoduodenal fistula. The normal, distended gallbladder and lack of pneumobilia on CT would be concordant with this. Enteroliths typically form in the proximal bowel largely from bile salts and are often associated with duodenal or jejunal diverticula [3]. The enterolith in this case is likely to have formed within the blind jejunal loop of the Roux-en-Y reconstruction. Afferent loop obstruction secondary to enterolith ileus is a rare but recognised complication of a Roux-en-Y procedure, with fewer than 20 cases having been reported in the literature [4]. In this case the enterolith had passed beyond the jejunojunctionostomy to obstruct the distal small bowel rather than the afferent loop.

The radiological appearance of the enterolith is also potentially misleading in this case. The single fine

Figure 2. Large enterolith removed from site of obstruction at laparotomy.

curvilinear arc of calcification within it led to a differential diagnosis at the time of scanning, which included the ingestion of a foreign body such as a fish or chicken bone. Though there is little in the literature regarding

the imaging characteristics of enteroliths, the CT appearances of gallstones have been well documented. A complete ring of peripheral high density is a relatively common appearance for gallstones on CT (approximately 22% of cases), with an incomplete ring resulting in an arc-like density being a less common, but recognised appearance [5], as was seen in this case. The bulk of the enterolith in this case was of low density on CT, making it difficult to appreciate. Low-density gallstones are a not uncommon finding, and tend to be associated with cholesterol stones [6].

CONCLUSION

Enterolith ileus is a rare cause of small bowel obstruction, more commonly associated with duodenal or jejunal diverticula. The diagnosis of enterolith ileus should be considered in cases of small bowel obstruction following past gastroduodenal or biliary surgery that has resulted in luminal stasis of bile within a blind-ending segment of small bowel that is in continuum with the biliary system. The appearance of calcification within enteroliths can be misleading, and low-density enteroliths, as with gallstones, can be difficult to fully appreciate on CT imaging.

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