CASE REPORT

A case of recurrent gallstone ileus: the fate of the residual gallstone remains unknown

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SUMMARY

Gallstone ileus is a serious complication of cholelithiasis where mechanical small bowel obstruction occurs. The recurrence of gallstone ileus is rare. The 67-year-old woman in this case report had three known gallstones transit her small bowel with two causing obstruction and the third causing a 'tumbling phenomenon'. As we have an ageing population, and gallstone ileus has a higher incidence in the over 65 age group, associated with increased comorbidities and hence greater mortality rates, it is imperative to establish the best surgical intervention for it. This case report highlights the difference CT of the abdomen has made to the diagnosis of gallstone ileus and the pros and cons of the surgical management options.

BACKGROUND

Gallstone ileus is a rare complication of cholelithiasis. It accounts for 1–3% of all cases of mechanical small bowel obstruction.¹ Approximately 5% of the patients suffering from one episode of gallstone ileus can have recurrent episodes.^{2–4} Gallstone ileus is more common in women and is accountable for approximately a quarter of all mechanical small bowel obstructions in patients over the age of 65.⁵ It occurs due to the formation of a biliary-enteric fistula, commonly between the gangrenous gallbladder and the duodenum although connections to the colon and the stomach have also been seen with the latter being the least common.⁶ Gallstones can pass into the small intestine through these connections. Gallstones less than 2.5 cm in diameter may traverse the small bowel without causing obstruction.⁷ Approximately 80% of stones pass without the manifestation of small bowel obstruction, but the potential remains for large gallstones to become lodged in the small bowel and develop obstruction, most commonly in the terminal ileum due to its being narrower.⁸

This case report will aim to evaluate the different surgical approaches to the management of gallstone ileus and the degree to which CT of the abdomen has improved the diagnostic capability of clinicians preoperatively.

CASE PRESENTATION

A 67-year-old Caucasian woman with a medical history of angina, hypertension and previous myocardial infarction presented with a 1-day history of cramping epigastric pain associated with bilious vomiting and abdominal distension. She had a normal bowel motion on the morning of the presentation. Clinical examination confirmed

abdominal distension, epigastric tenderness and sluggish bowel sounds. Bloods on admission showed mild leucocytosis, $15.2 \times 10^9/L$ and a raised C reactive protein, 46 mg/L. The liver function tests were normal. The following day the C reactive protein was $>300 \text{ mg/L}$. Immediate management included intravenous fluids, analgesia, nasogastric tube insertion and intravenous tazocin 4.5 g three times a day. CT of the abdomen with contrast showed small bowel obstruction secondary to an ectopic gallstone as well as two further gallstones within the gallbladder (figures 1 and 2). The patient underwent an emergency laparotomy and ileal enterolithotomy. The enterolithotomy is classically performed through an incision proximal to the site of obstruction in order for a safe enterotomy closure. Postoperatively she developed a wound infection which was treated with oral co-amoxiclav 625 mg three times a day and then was discharged.

The patient was re-admitted 11 months later with generalised abdominal pain and two episodes of vomiting. White cell count and C reactive protein were raised, $14.9 \times 10^9/L$ and 53 mg/L, respectively, with normal liver function tests. Abdominal X-ray showed dilated small bowel loops. CT of the abdomen once again confirmed gallstone ileus (figures 3 and 4) with one residual stone remaining within the gallbladder. It was treated via a laparoscopic enterolithotomy with the enterotomy closure being made with 3.0 polydioxanone (PDS) extramucosal sutures. The patient's postoperative recovery was unremarkable. A follow-up appointment was arranged for 6 weeks to discuss the definitive management.

Figure 1 Transverse CT showing two remaining gallstones in the gallbladder at first presentation.

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Figure 2 Coronal CT showing an ectopic gallstone with proximal small bowel dilation.

Figure 4 Coronal CT showing an ectopic gallstone obstructing the terminal ileum with proximal small bowel.

Seventeen days postdischarge she was readmitted for a third time with a 9 h history of intermittent cramping abdominal pain. She had no associated vomiting and had opened her bowels with a normal motion. CT of the abdomen confirmed the presence of a gallstone in the descending colon (figures 5 and 6) with the gallbladder not being visualised clearly. The patient was treated in a conservative manner by keeping her nil by mouth, giving her intravenous fluids and analgesia. Her symptoms settled over the next 24 h. The intermittent colicky nature of her pain on this admission was a result of distal migration of the gallstone through the bowel, also known as the ‘tumbling phenomenon’.⁸

OUTCOME AND FOLLOW-UP

An outpatient ultrasound scan was arranged to check for any remaining gallstones within the gallbladder, which confirmed the presence of one calculus. An outpatient clinic appointment has once again been arranged for 6 weeks from discharge to discuss a cholecystectomy. However, in the interim period, the fate of the residual gallstone remains unknown.

DISCUSSION

With an ageing population and gallstone ileus being more prominent among the elderly, it is of paramount importance that we

are able to arrive at a diagnosis earlier and manage these patients effectively to reduce the incidence of complications and recurrence after index admission.

Contrast-enhanced CT of the abdomen is an effective imaging modality to confirm the diagnosis of gallstone ileus with a sensitivity and specificity of 93% and 100%, respectively.⁹ Rigler’s triad is the criteria used to determine gallstone ileus on a CT scan.^{10 11} The components of the triad are pneumobilia (figure 7) which suggests the presence of a biliary-enteric fistula, an ectopic gallstone and small bowel obstruction. The majority of trusts now have access to a CT scanner, allowing for an early accurate diagnosis to be reached.^{9 11} Higher mortality rates were commonly due to the delay from symptom onset to surgical intervention, on average between 7 and 10 days.¹² In addition, the majority of patients presenting with gallstone ileus had a number of comorbidities influencing the long-term outcome.

Although laparoscopic surgical intervention is used, an open approach is still the mainstay of treatment as it allows better visualisation and assessment of the bowel both proximal and distal to the occlusion. The three main surgical interventions used include: (1) enterolithotomy alone, (2) one-stage procedure which involves removal of the stone, cholecystectomy with biliary-enteric fistula repair on index admission or (3) the two-

Figure 3 Transverse CT showing a gallstone lodged in the terminal ileum.

Figure 5 Transverse CT showing a gallstone in the descending colon.

Figure 6 Coronal CT confirming the presence of a gallstone in the descending colon.

stage repair where the stone is extracted and an interval cholecystectomy with fistula repair is conducted in 6–8 weeks post-initial procedure.

A simple enterolithotomy is unanimously associated with a lower mortality rate compared with the one-stage procedure with mortality rates being quoted between 9.1 and 18.8% compared to 11.1–33.3%.^{8 13 14} The rationale for the simple enterolithotomy is that the patent fistula in the majority of these patients spontaneously close, length of surgery is shorter and gallstone ileus recurrence is only approximately 5%.^{13 15} However, this patient underwent a simple enterolithotomy on index admission with a two-stage procedure planned after the second episode of gallstone ileus but the patient re-presented before the interval cholecystectomy could be performed for a third time with the ‘tumbling phenomenon’. The patient was considered too high risk and unwell to undergo a one-stage procedure at any presentation. We feel that this outlines why it is imperative to develop a system, which can be used to help determine the group of patients susceptible to recurrent gallstone

Figure 7 Coronal CT showing pneumobilia.

ileus. An important discussion point is the size of the residual gallstone in the gallbladder and the relative risk of further episodes of gallstone ileus, as gallstones greater than 2.5 cm have a greater potential. We feel that the size of any residual gallstone should be taken into consideration along with patient factors, fitness for surgery and the surgeon’s discretion when considering the possibility of a two-stage procedure on index admission. Comparative outcomes for a simple enterolithotomy versus a two-stage procedure are limited. We remain with the possibility that a cholecystectomy on index admission or at a 6-week interval following the index admission may have prevented further episodes of gallstone ileus in this case.

Learning points

- ▶ In elderly patients (especially over 65) presenting with symptoms of small bowel obstruction, gallstone ileus should be a differential diagnosis.
- ▶ Time to surgery is a key factor impacting outcome and early use of CT of the abdomen can aid in the diagnosis of gallstone ileus.
- ▶ The consensus is that simple enterolithotomy is the favourable surgical intervention.
- ▶ Careful selection of patients in need for interval cholecystectomy, taking into consideration the size of residual gallstones in the gallbladder may help reduce recurrences of gallstone ileus in high risk patients.

Competing interests None.

Patient consent Obtained.

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