CASE REPORT

Unusual aetiology of abdominal wall abscess: cholecystocutaneous fistula presenting 20 years after open subtotal cholecystectomy

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SUMMARY

A 68-year-old woman presented to the emergency department, with an abscess in the right upper anterior abdominal wall. She had a medical history of an open cholecystectomy 20 years prior, diabetes, obesity and a laparotomy for perforated sigmoid diverticular disease complicated by a large parastomal hernia. CT revealed this subcutaneous abscess to track intra-abdominally through the liver and communicate with the gallbladder fossa. The abscess was incised and drained. The wound initially drained pus, and then bile. Magnetic resonance cholangiopancreatogram (MRCP) demonstrated a remnant gallbladder containing 2 gallstones, a cholecystocutaneous fistula, portal vein thrombosis and cavernous transformation of the bile duct. The patient improved and was discharged. The patient's case history and imaging were discussed with the tertiary referral centre, in a multidisciplinary team. After an extensive and balanced discussion, the patient declined a completion cholecystectomy and continues to have occasional discharge from the fistula in her right upper quadrant.

BACKGROUND

This case presents a rare cause for anterior abdominal wall abscess. It highlights the importance of a detailed clinical history in the management of surgical cases as well as the importance of completely excising the gallbladder at the time of primary cholecystectomy, whenever it is safe to do so.

CASE PRESENTATION

A 68-year-old woman presented to the accident and emergency department with a painful swelling in her right upper abdomen. She had noticed the lump 5 days previously, and felt it had become progressively more red and painful over the following days. Systemically she was well, with a good appetite and no symptoms of fever.

She had a medical history of obesity (with a current body mass index (BMI) of 40 kg/m²), hypertension, hypercholesterolaemia and type 2 diet-controlled diabetes. Her regular medications included ramipril, amlodipine, simvastatin and ferrous fumarate. Her surgical history included open cholecystectomy for acute cholecystitis approximately 20 years previously, and a Hartmann's procedure and formation of end colostomy following a perforated diverticular abscess 9 years previously, subsequently complicated by a large parastomal hernia. The cholecystectomy was

performed at another institution and the original operative notes could not be retrieved.

On examination, the patient was found to have difficulty mobilising due to pain. She was afebrile on admission, with all observations in the normal range, and a blood glucose reading of 5.8 mmol/L. In the right upper quadrant of the abdomen, a 10 by 10 cm mass was visible (figure 1), within an area of cellulitis measuring approximately 20 by 15 cm. This was tender and warm to the touch, consistent with an abscess. It lay close to an upper midline laparotomy scar from the cholecystectomy operation.

INVESTIGATIONS

Admission blood tests were as follows (reference ranges). The white cell count was elevated at $24.9 \times 10^9/L$ ($4-11 \times 10^9/L$), with a neutrophilia of $22.9 \times 10^9/L$ ($2-7.5 \times 10^9/L$), and C reactive protein (CRP) was also raised (407 mg/L; 0–10 mg/L), indicative of an infective process. Liver function tests revealed total bilirubin 8 µmol/L (0–21 µmol/L), alanine transaminase 8 IU/L (0–41 IU/L), alkaline phosphatase 56 IU/L (30–130 IU/L), low plasma

Figure 1 External appearance of the abscess measuring approximately 10 cm×10 cm with overlying cellulitis.

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albumin at low 23 g/L (35–50 g/L) and prolonged international normalised ratio at 1.3 (0.8–1.2).

Following review and further questioning by the consultant surgeon, the patient gave a history of a complicated cholecystectomy operation, where it had not been possible to completely remove the gallbladder. In view of this history, the unusual location of the abscess, previous perforated diverticulitis and high BMI, as well as the fact that the patient had no signs of cardiovascular compromise associated with her sepsis, a CT scan of the abdomen and pelvis was requested rather than immediate surgical intervention.

The initial CT scan (figure 2) showed a large peripherally enhancing fluid-filled collection within the subcutaneous tissue of the right upper anterior abdominal wall, measuring 8.6×6.6 cm. The collection extended into the abdominal cavity, with a small contiguous collection adjacent to the capsular surface of the liver, measuring 5.6×1.2 cm. A tract was seen extending from this collection through the liver to terminate in the region of the gallbladder fossa, where a fluid-filled structure containing soft tissue and a calcific density, suggestive of a gallbladder containing calculi, was present. The common bile duct was mildly dilated throughout its length with a diameter of 7 mm, and a large duodenal diverticulum was noted.

TREATMENT

The patient was admitted for planned incision and drainage of the abscess. She was started on analgesia and intravenous cefuroxime, metronidazole and gentamicin. The abscess was incised in theatre under general anaesthetic and 500 mL of frank pus drained. A tract extending intraperitoneally from the cavity was identified. No bile was visible intraoperatively. The cavity was packed with Kaltostat (ConvaTec); a corrugated drain (Portex) was placed in the superficial cavity and Robinson drain (Soft-Drain Set, pfmmmedical) was placed into the intraperitoneal tract. A wound manager bag (Coloplast) was placed over the site of incision.

The following day, the patient was comfortable, with much less pain, and remained in a stable condition. The stoma bag was seen to contain bile, with a total output of 150 ml drained over the next 24 h. The patient's white cell count ($14.2 \times 10^9/L$) and CRP (304 mg/L) were improved compared with preoperative values. A repeat CT was carried out 2 days later to ensure the drains were well sited and to further characterise the hepatobiliary anatomy. This showed the original anterior abdominal wall abscess cavity, now with the drain in place, measuring 3.3×3.9 cm with associated surrounding inflammation. This superficial collection appeared to be in direct continuity with

Figure 2 Initial CT imaging showing fluid collection in the subcutaneous tissue of the anterior abdominal wall, measuring 8.6×6.6 cm and extending into the abdominal cavity.

the gallbladder fossa. The tip of the Robinson drain was located in the gallbladder fossa and extensive inflammatory change was seen here along with a few tiny locules of air, likely related to the drain, while no discrete collections were identified. There was enhancement and thickening of the peritoneum within the right side of the abdomen and extensive subcutaneous oedema around the abdomen. No generalised free intraperitoneal fluid was seen and the extent of the intrahepatic duct dilation was less significant than on the previous CT. The extrahepatic ducts also appeared less dilated.

An endoscopic retrograde cholangiopancreatogram (ERCP) and sphincterotomy were attempted 3 days following this operation, to favour internal drainage of bile, as the abscess cavity continued to drain bile. Unfortunately, despite repeated attempts at visualisation, the ampulla was unable to be positively identified. It appeared to lie within a small mouthed, fibrosed duodenal diverticulum, as the initial CT scan had suggested. The case was discussed with the interventional radiology team, with a view to percutaneous transhepatic cholangiography and insertion of stents: this was deemed too challenging, as the biliary ducts were no longer dilated. To successfully image the area further, an MRCP was undertaken. This showed a fistulous tract leading from the subcutaneous abscess, crossing the liver and communicating directly with the fundus of the gallbladder. Two large gallstones were seen within the remnant gallbladder, both measuring 16 mm. No intrahepatic duct dilation was seen and the common bile duct did not appear dilated; it now measured 4 mm maximally with normal tapering to the ampulla.

After 7 days, the antibiotics were stopped and the patient was monitored for a further 3 days before discharge. She remained afebrile and her inflammatory markers continued to normalise with a white cell count of $7.9 \times 10^9/L$ and CRP of 31 mg/L on her last day of admission. The patient was discharged with daily dressing changes of the abscess cavity to be carried out by the practice nurse.

OUTCOME AND FOLLOW-UP

The patient continues to be managed conservatively with ongoing follow-up. Her superficial abdominal wall wound has almost healed, but she does occasionally get minimal bile stained discharge from the site. These symptoms have minimal impact on the patient's quality of life. An interval CT scan has demonstrated that the cholecystocutaneous fistula persists. She has had no further hospital admissions over the past 12 months since her original presentation, but she has had two episodes of cellulitis at the drainage site, treated with oral antibiotics, in the community. She was discussed with the hepatobiliary surgeons in our local subspecialist unit, who recommended completion cholecystectomy due to the risk of further complications of her remnant gallbladder. After a detailed discussion, highlighting the risks and benefits involved, the patient declined further intervention.

DISCUSSION

This is an unusual case. It is rare for infected gallbladder contents to drain from an anterior abdominal wall abscess. Such an occurrence may result from an obstructed cystic duct or common bile duct, leading to cholecystitis and/or empyema, with eventual perforation of the gallbladder or gallbladder remnant.¹ Over time, infected bile tracks towards the anterior abdominal wall, eventually pointing as a visible abscess. In cases where this does occur, patients usually present with symptoms of right upper quadrant pain and fever dating back some weeks before an abscess is apparent.² In contrast, the patient in this

report had a short history, without any symptoms until 5 days prior to presentation.

Gallbladder complications following cholecystectomy are infrequent since in most cases the entire gallbladder is removed. During a difficult operation, especially where the biliary anatomy is uncertain, for safety reasons, the surgeon may decide to perform a subtotal cholecystectomy. The term 'subtotal cholecystectomy' has historically been loosely applied, but the two main variants are as follows: a 'subtotal reconstituting cholecystectomy', which involves leaving part of Hartmann's pouch in situ, and a 'subtotal fenestrating cholecystectomy', which refers to leaving one wall of the gallbladder in situ, adherent to the liver bed.^{3,4}

A subtotal reconstituting cholecystectomy is associated with a risk of recurrent cholelithiasis, as a remnant gallbladder is present. In contrast, a subtotal fenestrating cholecystectomy is more likely to be complicated by bile fistulae due to the cystic duct remaining open to the peritoneal cavity.⁴ Where a subtotal cholecystectomy is unavoidable, we recommend that the operative record includes an accurate description of the actual procedure performed (with a diagram where appropriate), as this has an impact on the likelihood of certain postoperative complications.

Following all types of subtotal cholecystectomy, complications related to gallstones may present at any time after surgery. Even in these cases, such complications are uncommon. A recent systematic review showed that the incidence of biliary symptoms postsubtotal laparoscopic cholecystectomy was 2.2%; in all cases, presentation was related to right upper quadrant pain.⁵ The majority of case reports regarding gallstone complications postcholecystectomy describe intermittent right upper quadrant pain as the most common symptom, with gallstone pancreatitis and jaundice occurring occasionally.⁶⁻⁸

With respect to short-term complications, recent meta-analysis reveals that open subtotal cholecystectomy carries a higher risk of subhepatic collections (laparoscopic vs open, OR 0.4; 95% CI 0.2 to 0.9) and of reoperation (OR 0.5; 95% CI 0.3 to 0.9).⁹ This is in large part likely to be due to the fact that the most 'difficult' gallbladders are converted to open, rather than due to the open technique in itself. Cholecystectomies that are challenging are more likely to result in a higher risk of subhepatic complications compared with laparoscopic subtotal cholecystectomy.

Anterior abdominal wall abscesses have been recorded after cholecystectomy as a complication of retained stones. This can happen many years after surgery, for example, in the case of a patient who presented with painful defecation due to an abscess in the pouch of Douglas, and was also found to have a small asymptomatic chronic anterior abdominal wall abscess.¹⁰ Gallstones have also been reported to lodge in the anterior abdominal wall during port removal after laparoscopic cholecystectomy—either at the level of the rectus sheath or internal oblique muscle—and to cause abscess formation up to 8 years after operation.^{11,12}

As aforementioned, it is rare for the gallbladder remnant in a subtotal reconstituting cholecystectomy to lead to an anterior wall abscess. Collections around the gallbladder are more likely to occur soon after subtotal fenestrating cholecystectomy where the gallbladder stump has been intentionally left open, or if any sutures placed have slipped.⁹ However, in this case, our patient developed a bile fistula leading to an abdominal wall abscess, having had a reconstituted Hartmann's pouch many years after primary surgery. This complication is likely to have been precipitated by a temporarily obstructed common bile duct (CBD),

with CT initially suggesting intrahepatic and extrahepatic duct dilation, leading to a perforation of the gallbladder remnant. Duct dilation had resolved by the time of the postoperative MRCP, which also showed no definite cause for the temporary obstruction. After perforation, the resulting tracking of infected remnant gallbladder contents is likely to have taken some time to evolve, and it is likely that subcutaneous adiposity and diabetes may have dampened or masked the patient's symptoms until 5 days before presentation.

It is widely accepted that, when a reconstituted remnant gallbladder containing gallstones leads to complications, treatment is as for a primary presentation of cholelithiasis. This involves cholecystectomy with other adjuncts, such as ERCP and percutaneous drainage, as necessary.⁵ After weighing up the risks and benefits, the patient in this case decided to decline cholecystectomy. Her symptoms are consistent with an ongoing cholecystocutaneous fistula; its failure to completely heal suggests that there is intermittent obstruction to free internal biliary drainage. She remains at risk of further gallstone-related complications in the future.

Learning points

- Late gallstone complications can occur in patients postcholecystectomy. The likelihood of this is increased where the cholecystectomy was complicated, subtotal, or where stones were dropped and not retrieved intraoperatively. Where complete cholecystectomy is not possible, the operating note must clearly record the exact procedure performed.
- Complete cholecystectomy should always be the aim of the primary operation, since all types of subtotal cholecystectomy are associated with higher complication rates.
- Patients ought to be well informed if a subtotal cholecystectomy is performed or if stones are spilled, as this may facilitate diagnosis of a future complication.
- Patients presenting with anterior abdominal wall abscesses, especially when these patients are diabetic and/or obese, may have occult intra-abdominal sepsis. Another example might be a left iliac fossa abscess originating from perforated diverticulitis.
- The immediate treatment of any abscess is drainage. Where there is no obstruction to biliary outflow, a gallbladder perforation will eventually heal.

Contributors WM wrote the main body of text of the case report as well as gaining formal written consent from the patient, and contributed to the discussion. ERM authored the discussion and learning points, including references. JD was in charge of the patient's overall care, obtained images with consent and edited the report.

Competing interests None declared.

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