

## Case report

# Late complication following percutaneous cholecystostomy: retained abdominal wall gallstone

M. Raissaki<sup>1</sup>, A. A. Hatzidakis<sup>1</sup>, P. Prassopoulos<sup>1</sup>, A. Bakandaki<sup>1</sup>, N. Vrachassotakis<sup>2</sup>, S. J. Vasilakis<sup>2</sup>, N. C. Gourtsoyiannis<sup>1</sup>

<sup>1</sup> Department of Radiology, University Hospital of Heraklion, Medical School of Crete, GR-71110 Stavrakia, Heraklion, Crete, Greece

<sup>2</sup> Department of General Surgery, University Hospital of Heraklion, Medical School of Crete, GR-71110 Stavrakia, Heraklion, Crete, Greece

Received: 27 August 1999; Revised: 7 December 1999; Accepted: 9 December 1999

**Abstract.** A case of recurrent abdominal wall abscess following percutaneous cholecystostomy (PC) is presented. Transperitoneal PC was performed in an 82-year-old female with calculous cholecystitis. Symptoms resolved and the catheter was removed 29 days later. The patient came back 5 months later with a superficial abscess that was drained and 8 months post PC with a fistula discharging clear fluid. Ultrasonography revealed the tract adjacent to an area of inflammation containing a calculus, whereas CT failed to depict the stone. Subsequent surgery confirmed US findings. To our knowledge, this is the first report of a dislodged bile stone following percutaneous cholecystostomy.

**Key words:** Percutaneous cholecystostomy – Complications – Gallstone – Abdominal wall imaging – Ultrasonography

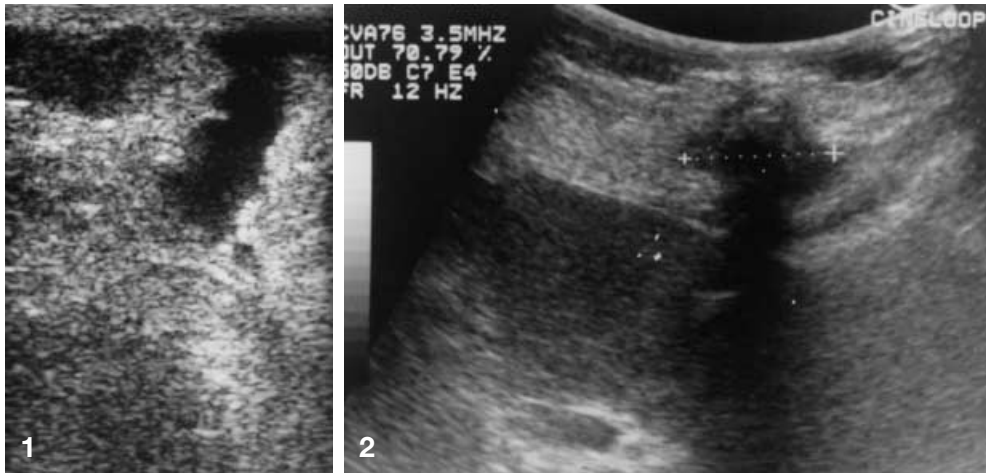
## Introduction

Percutaneous cholecystostomy has been successfully employed for the treatment of acute cholecystitis in elderly patients [1, 2, 3]. Complications associated with percutaneous cholecystostomy usually occur immediately or within days and include bile peritonitis, haemorrhage, sepsis, vagal reactions, perforation of an intestinal loop, secondary infection or colonisation of the gallbladder and catheter dislodgement [1, 2, 4, 5, 6]. Late complications have occasionally been reported and include catheter dislodgement and recurrent cholecystitis [2]. Overall the reported rates of major complications range from 3 to 8%, and the rates of minor complications range from 4 to 13% [1, 6]. We report an unusual case of abdominal wall abscess 8 months following PC for calculous cholecystitis triggered by a dislodged bile stone.

## Case report

An 86-year-old female was admitted with right upper quadrant pain, high fever (body temperature up to 40°) and anorexia. Clinical examination revealed positive Murphy's sign and mild muscle contraction locally. She was tachycardic with 110 pulsations per minute and arrhythmia. Blood pressure was 130/80 mmHg. Blood tests revealed mild leucocytosis [white blood cell (WBC) count was  $10.6 \times 10^9/l$ ], normal liver function tests and normal serum bilirubin and amylase levels. An abdominal ultrasound scan supported the diagnosis of calculous cholecystitis demonstrating multiple gallstones, a thickened and oedematous gallbladder wall and a dilated painful gallbladder. Due to advanced age, poor general condition and arrhythmia, the patient was considered a poor candidate for immediate cholecystectomy. She was started on intravenous antibiotics and percutaneous cholecystostomy was performed under CT guidance. Due to relative lack of experience with PC at that stage, CT was considered safer and was preferred to US. We currently perform PC routinely under US guidance. The gallbladder was punctured transperitoneally with a 22-G needle. A 7-F locking pigtail catheter was placed in the gallbladder by using the Seldinger technique. Fever resolved within 48 h and pain became milder within 6 h. On the sixth day post PC, WBC was  $7.7 \times 10^9/l$ . Diagnostic cholangiography through the catheter showed multiple gallstones filling the gallbladder's lumen and patent cystic and common bile ducts. Fistulography on the 28th day demonstrated a well-formed straight tract without any filling defects or contrast leakage. Symptoms and leucocytosis resolved and the catheter was subsequently removed. The patient refused further surgical treatment.

Five months later, the patient came back with a superficial abscess at the site of puncture that was drained under local anaesthesia. There were no phenomena of general sepsis and WBC was  $6.4 \times 10^9/l$  at the time. She came back 2 months later, 8 months following percuta-



**Fig. 1.** Ultrasound scan over the fistulous tract shows a straight anechoic fluid-filled tract superficially, adjacent to an area of low echogenicity

**Fig. 2.** A hypoechoic inflammatory area is displayed anterior to the liver, involving the abdominal wall. An echogenic structure casting an acoustic shadow is depicted in the middle

neous cholecystostomy, with a fistula continuously discharging clear fluid from the site of initial puncture, mild focal tenderness and otherwise well. The WBC was  $4.7 \times 10^9/l$ . Ultrasonography was performed with a convex 3.5-MHz and a linear 5-MHz array and demonstrated a fluid-filled tract anteriorly to the fundus of the gallbladder (Fig. 1). Deeper in the abdominal wall an area of low echogenicity with irregular and indistinctive borders was noted, containing an echogenic structure reminiscent of a stone (Fig. 2). Computed tomography was performed with 10-mm axial slices followed by 5-mm slices over the gallbladder post intravenous contrast administration. Computed tomography confirmed the presence of the fistula and findings consistent with inflammation and early abscess formation of the abdominal wall (Fig. 3). A foreign body could not be identified on CT scan, neither prospectively nor retrospectively.



**Fig. 3.** Postcontrast 5-mm section at the level of the gallbladder's fundus reveals enhancing inflammatory changes of the abdominal wall and a non-dilated adherent gallbladder with wall thickening. Part of the fistulous tract is seen superficially with a density similar to water. The retained bile stone is not discernible

At operation, the abdominal wall was inflamed and a 1.2-cm gallbladder stone was found within the soft tissues and extracted. Excision of the fistula and the gallbladder was performed. Pathology of the excised gallbladder showed changes of acute inflammation superimposed on changes of chronic cholecystitis. The post-operative course was uneventful.

## Discussion

Percutaneous cholecystostomy is particularly beneficial in patients with acalculous cholecystitis because the gallbladder can usually be left in situ, whereas in cases of calculous cholecystitis it should be limited to critically ill patients in whom surgery cannot be performed [1, 3, 4]. Recurrence of cholecystitis due to residual stones is a well known complication following percutaneous cholecystostomy [2]; therefore, cholecystectomy is indicated in those patients in whom the gallstones are not removed percutaneously [1]. In our patient a dislodged biliary calculus was responsible for inflammation involving structures surrounding the gallbladder. This rare complication supports the concept that percutaneous cholecystostomy remains a method of temporary treatment of calculous cholecystitis in high-risk operative patients before they undergo definitive surgical treatment.

We were not able to establish the cause of stone extravasation, nor whether this occurred during placing the catheter in the gallbladder, on removal of the catheter or at a later stage. However, stone dislodgement during catheter placement appears unlikely, since there were no clinical signs of perforation, and the fistulography performed in our patient confirmed the presence of a well-formed straight tract without any filling defects to suggest a lost stone. Extravasation of the stone on removal of the catheter also appears unlikely because the drainage catheter used had a size of 7 F and the stone had a size of 1.2 cm. It appears more likely that dislodgement of the stone occurred at a later stage.

Contractility of the gallbladder can be altered following cholecystostomy due to adhesions [7]. In our patient

adhesions between the gallbladder and the anterior abdominal wall were present, the lumen of the gallbladder was filled with stones and pathological examination of the excised specimen revealed changes of acute inflammation superimposed on changes of chronic cholecystitis. Local fibrosis and altered peristalsis could have interfered with prompt healing of the gallbladder wall, whereas stones could have contributed in pushing material against the healing wall resulting in extravasation of a calculus at a later stage. Recurrent cholecystitis, a common complication in patients with residual gallbladder stones [2], could also be considered in this case resulting in perforation at the weakest side of the gallbladder wall. The former catheter tract could have acted as an outlet for the inflammatory material. In that phase the gallstone could have migrated to the abdominal wall maintaining the inflammatory mass in that region. In our patient there was a fistula discharging clear fluid that could represent the normal fluid production of the gallbladder wall itself in case of blockage of the cystic duct. The latter explanation appears more likely, based on the presence of extensive inflammation of the gallbladder and surrounding tissues on CT and on pathological results. The route of catheter placement may also have a role in this complication. On transhepatic approach the liver can possibly tamponade the site of gallbladder puncture to prevent not only bile leaks but also spillage of stones.

Spilled gallstones are known to occur after laparoscopic cholecystectomy with a wide spectrum of subsequent specific complications including intra-abdominal abscess formation with or without abdominal wall sinus tract development, abdominal wall abscess and persisting abdominal wall sinus tracts [8, 9, 10, 11]. They usually present late following laparoscopic cholecystectomy and can occur as late as 3 years later [8, 11]. To our knowledge, the presented case is the first report of a spilled stone following percutaneous cholecystostomy.

When encountering extrinsic foreign bodies in the abdominal wall, clinical diagnosis is usually straightforward. In our patient the presence of a foreign body was not clinically suspected because it was not palpable and its origin was internal. Ultrasonography was the only test to suggest the presence of a calculus responsible for the inflammatory abdominal wall changes. Ultrasonography is known to be efficient when evaluating soft tissues for the presence of foreign bodies and is better than CT in detecting gallbladder stones. In our patient the extent of inflammation was clearly defined with CT but the stone was missed, apparently due to low calcium concentration. Similarly, thin-section CT failed to show an ultrasonographically identified non-

calcified lost gallstone as the cause of an abdominal wall abscess following laparoscopic cholecystectomy [11]. Computed tomography was also misleading in a complex case of a retained stone in an incarcerated hernia with abscess formation simulating a tumor [12].

The case described is an unusual case of recurrent abdominal wall abscess due to an extravasated bile stone following removal of a percutaneous cholecystostomy catheter. It emphasises the need of further treatment of patients with calculi following percutaneous cholecystostomy. Imaging might be of value before treating spontaneous abdominal wall abscesses. Ultrasonography is the investigation recommended for the follow-up of symptomatic patients following percutaneous cholecystostomy, especially in the rare occurrence of late abdominal wall abscess formation.

## References

1. Gervais DA, Mueller PR (1996) Percutaneous cholecystostomy. *Sem Intervent Radiol* 13: 35–43
2. Van Overhagen H, Meyers H, Tilanus HW, Jeekel J, Laméris JS (1996) Percutaneous cholecystostomy for patients with acute cholecystitis and an increased surgical risk. *Cardiovasc Intervent Radiol* 19: 72–76
3. VanSonnenberg E, D'Agostino HB, Casola G, Varney RR, Ainge GD (1990) Interventional radiology in the gallbladder: diagnosis, drainage, dissolution and management of stones. *Radiology* 174: 1–6
4. Mendez A, Mancera-Maldonado JL, Castañeda F (1994) Complications of percutaneous cholecystostomy. *Semin Intervent Radiol* 11: 283–286
5. VanSonnenberg E, Wing VW, Pollard JW, Casola G (1984) Life-threatening vagal reactions associated with percutaneous cholecystostomy. *Radiology* 151: 377–380
6. VanSonnenberg E, D'Agostino HB, Goodacre BW, Sanchez RB, Casola G (1992) Percutaneous gallbladder puncture and cholecystostomy: results, complications and caveats for safety. *Radiology* 183: 167–170
7. Krom RAF, Pols J, Kingma LM, Strake LTE (1984) Long-term effects of cholecystostomy on gallbladder function. *Neth J Surg* 36: 121–123
8. Chin PT, Boland S, Percy JP (1997) "Gallstone hip" and other sequelae of retained gallstones. *HPB Surg* 10: 165–168
9. Graham MD, Anderson PG, Toouli J (1997) Abdominal wall sinus: a late complication of gallstone spillage during laparoscopic cholecystectomy. *HPB Surg* 10: 163–164
10. Carlin CB, Kent RB Jr, Laws HL (1995) Spilled gallstones: complications of abdominal-wall abscesses. Case report and review of the literature. *Surg Endosc* 9: 341–343
11. Van Hover P, Van Hoe L, Kerremans R, Baert AL (1997) Delayed remote abscess formation after spillage of infected gallstone during laparoscopic cholecystectomy: CT and US findings. *J Belge Radiol* 80: 9–10
12. Freedman AN, Sigman HH (1995) Incarcerated paraumbilical incisional hernia and abscess: complications of a spilled gallstone. *J Laparoendosc Surg* 5: 189–191