CASE REPORT

Successful non-operative management of spontaneous type II gallbladder perforation in a patient with Alzheimer's disease

Mario Alessiani,^{1,2} Andrea Peloso,¹ Paola Tramelli,¹ Enzo Magnani¹

¹Department of Surgery, Varzi Hospital, Varzi, Italy

²Department of Clinical, Surgical, Diagnostic and Pediatric Sciences, University of Pavia, Pavia, Italy

Correspondence to

Dr Mario Alessiani,
m.alessiani@unipv.it

Accepted 3 May 2014

SUMMARY

A 77-year-old man with Alzheimer's disease was admitted to a rural hospital in June 2012 and an acute cholecystitis was first diagnosed. Surgery was not considered as a possible option due to the critical condition of the patient and his severe comorbidities. After 2 days of broad-spectrum antibiotics, the patient worsened and developed severe sepsis. A gallbladder perforation with intrahepatic abscess formation was diagnosed on ultrasonography (US) and abdominal CT scan. The patient underwent percutaneous US-guided gallbladder drainage with resolution of the sepsis and rapid clinical improvement. After 1 month, the drainage was removed and the patient was discharged. He survived in good condition for 18 months and he passed away from pneumonitis in December 2013. This case shows that in a case of acute cholecystitis with gallbladder perforation, percutaneous gallbladder drainage can be a lifesaving procedure in elderly patients with severe comorbidities (including Alzheimer's disease) who are not candidates for elective surgery.

BACKGROUND

Acute cholecystitis is one of the most common indications for emergency surgery in the elderly. Immediate or delayed cholecystectomy in this cohort of patients is feasible and even recommended.¹ However, in critically ill elderly patients, this surgical approach is complicated with a higher incidence of perioperative morbidity and mortality. In such cases, percutaneous drainage of the gallbladder is a possible initial therapeutic option in order to avoid the risks of anaesthesia and surgical trauma.²

If acute cholecystitis is complicated by gallbladder perforation, percutaneous drainage can be initially performed in high-risk patients to overcome the critical phase, but secondary cholecystectomy is mandatory.³

Here, we report a case of spontaneous perforation of the gallbladder during an acute cholecystitis episode in an elderly patient affected by Alzheimer's disease treated successfully with percutaneous transperitoneal drainage without delayed cholecystectomy.

CASE PRESENTATION

A 77-year-old man with a medical history significant for Alzheimer's disease, hypertension and atrial fibrillation was transferred from an elderly care institute to the internal medicine unit of our

rural hospital with suspicion of an acute cerebral ischaemia episode. However, this condition was ruled out after a brain CT scan. The patient presented with acute pain reaction in the upper abdomen, fever, elevated white cell count (16 500/mm³, 87% neutrophils), borderline liver function tests (alanine transaminase 63 IU/L, aspartate transaminase 57 IU/L), abnormal kidney function tests (serum creatinine 4.05 mg/dL). Abdominal ultrasonography (US) revealed a dilated gallbladder with a thickened wall, sludge and small stones. No fluid collections were observed around the liver or in any other part of the abdomen. The common bile duct was normal. Clinical and US findings were consistent with an episode of acute cholecystitis.

Owing to the poor clinical condition of the patient (malnutrition, cardiovascular comorbidities, severe Alzheimer's disease and ASA score 4), emergency cholecystectomy was excluded and a conservative therapy was established with intravenous broad-spectrum antibiotics (piperacilline/tazobactam 4.5 g every 8 h). In the following 2 days, the patient's laboratory results worsened (white cell count 32 000/mm³, alanine transaminase 221 mU/mL, serum creatinine 5.72 mg/dL). In particular, a tendency towards acute kidney failure became evident as a consequence of sepsis.

INVESTIGATIONS

Physical examination of the abdomen was not reliable due to the patient's neuropsychiatric disease and the resultant behaviour. However, a painful reaction to deep palpation was evident without a clear positive Murphy's sign.

Figure 1 Ultrasonography shows gallbladder perforation (arrow) and its communication with the intrahepatic abscess (below).

CrossMark

To cite: Alessiani M, Peloso A, Tramelli P, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-204337

Video 1 The video shows the ultrasonography exam that allowed the diagnosis of gallbladder perforation and its communication with the hepatic collection in the right lobe.

At US control, an intrahepatic subglissonian fluid collection was observed in the right lobe of the liver, in the right subdiaphragmatic region. Furthermore, a small discontinuation in the thickened gallbladder wall was evident and in communication with the intrahepatic collection (figure 1 and video).

An abdominal CT scan confirmed gallbladder perforation and intrahepatic fluid collection involving segments V, VII and VIII (figure 2). No free fluid was present in the abdomen with the exception of some reactive clear fluid around the gallbladder. A diagnosis of an intrahepatic perforation of the gallbladder during an acute cholecystitis episode was clear. According to Niemeier's classification, the perforation was classified as type II.⁴

TREATMENT

We decided to perform a percutaneous drainage of the gallbladder. Under US control and local anaesthesia, an 8F pigtail catheter was inserted in the gallbladder via a transperitoneal approach. The procedure was uneventful and the catheter was left in place in order to drain by gravity and to perform daily lavages. On the basis of the results of the cultured bile (isolation of *Pseudomonas aeruginosa*), the intravenous antibiotic therapy was changed to meropenem 1000 mg twice daily.

OUTCOME AND FOLLOW-UP

Within 3 days, the laboratory tests as well as the kidney function tests returned to normal values. After 5 days of drainage and washing, US showed a shrunken gallbladder containing few stones and a marked reduction of the intrahepatic abscess. A contrast study via the drainage confirmed the lack of extrahepatic spillage and a normal common bile duct without stones inside (figure 3).

After 1 week, the patient was awake and resumed a normal diet. After 10 days the bile culture was negative and intravenous

Figure 3 After 14 days from the procedure, a contrast study via the drainage shows a normal common bile duct.

antibiotic therapy was discontinued. A weekly US control confirmed the resolution of the intrahepatic collection and the drainage was removed after 30 days. The patient was discharged in good clinical condition. The gallbladder was not removed and the patient survived in good condition for 18 months. He passed away from pneumonitis in December 2013.

DISCUSSION

Spontaneous gallbladder perforation is a life-threatening complication of acute cholecystitis. It is divided into three categories according to Niemeier's classification: type I, acute perforation into the free peritoneal cavity; type II, subacute perforation with abscess formation; type III, chronic perforation with bilioenteric fistula formation.⁴ In the last decade, its incidence has been reported to range from 0.8% to 5.6%.^{3 5 6} Therapeutic options are an urgent laparotomy (or laparoscopy) or percutaneous gallbladder drainage. Emergency laparotomy with cholecystectomy, drainage of abscess (if present) and peritoneal lavage have been performed in many reported cases.⁷⁻¹¹ A recent study showed that early laparoscopic cholecystectomy should be considered an optimal treatment for gallbladder perforation in selected patients.¹² A non-operative strategy consisting of ultrasound-guided percutaneous gallbladder drainage has been used in a smaller group of patients with gallbladder perforation.^{3 11}

On the basis of the literature, this latter conservative option seems to be more indicated in type II perforations (without free peritoneal dissemination) occurring in older patients with important comorbidities. The majority of these patients are unsuitable for general anaesthesia due to the extremely high-risk rate. Elderly patients affected by Alzheimer's disease or progressive dementia should be included in this high-risk category because of their serious comorbidities and their inability to interact with physicians and nurses.^{13 14}

Figure 2 CT scan confirms gallbladder perforation (arrow, left) and the subglissonian hepatic abscess involving segments V, VII and VIII (right).

In the case presented here, a surgical approach was impossible due to the very poor condition of the patient even at the time of first diagnosis of acute cholecystitis. It is possible that in this case, the compromised neurological status due to severe Alzheimer's disease contributed to delaying the patient's transfer from the elderly care institute to the hospital and therefore the diagnosis of acute cholecystitis was made. As a consequence, the only possible therapeutic option in this case, when gallbladder perforation was diagnosed, was the percutaneous drainage of the gallbladder.

This non-operative therapeutic intervention is suggested for the treatment of acute cholecystitis in critically ill patients.^{2 15} It was first described by Radder in 1980.¹⁶ One advantage of this procedure is the possibility to perform it at the bedside of the patient, under local anaesthesia and with few instruments. Another great advantage is the demonstration that this method can reduce mortality and morbidity rate in high-risk patients.^{17 18} In general, it is considered as a bridge for secondary elective cholecystectomy either with open or laparoscopic approach. The timing for cholecystectomy should be decided according to the clinical condition of the patient but, especially in the presence of gallstones, surgery should not be delayed in the long term in order to prevent recurrent biliary symptoms.²

In the case of gallbladder perforation as a complication of acute cholecystitis, the choice between surgery and percutaneous drainage in critically ill patients should be evaluated carefully. The few cases reported in the literature along with the case described here demonstrate that percutaneous gallbladder drainage in type II perforation can be lifesaving.^{7–11} On the basis of our and other previously cited experiences, this non-operative strategy can be useful in high-risk patients as an initial therapeutic choice followed by elective cholecystectomy or as a rescue therapeutic procedure for those patients unsuited even for subsequent elective surgery.³

Learning points

- Spontaneous gallbladder perforation is a life-threatening complication of acute cholecystitis that usually requires urgent open or laparoscopic cholecystectomy and peritoneal lavage.^{7–11}
- In critically ill patients with important comorbidities, percutaneous gallbladder drainage may represent a safer strategy as a bridge for secondary elective cholecystectomy.³
- This case shows that percutaneous gallbladder drainage can be a lifesaving procedure in elderly patients with severe comorbidities (including Alzheimer's disease) who are not candidates for immediate or future elective surgery.
- Percutaneous gallbladder drainage is a fairly easy procedure that can be performed in rural hospitals with undoubted logistic advantages for the patient and his family.

Finally, it is important to underline that this case was managed in a rural hospital that serves a large rural community in northern Italy. For elderly patients and their families living in a rural area, the proximity of an appropriate level of care is very important not only for logistic reasons but also because it results in a lower death rate.¹⁹ In this case, two key points contributed to the positive outcome: the diagnosis of perforation on US, and the decision to drain the gallbladder percutaneously. Both procedures can be performed easily in rural hospitals where more complex diagnostic or interventional tools are not readily available.

Contributors All the authors contributed equally to drafting of the manuscript, to corrections and to edit the final version. All authors were involved in the care of the patient.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Ferrarese A, Solej M, Enrico S, *et al.* Elective and emergency laparoscopic cholecystectomy in the elderly: our experience. *BMC Surg* 2013;13(Suppl 2):S21.
- 2 Melloul E, Denys A, Demartines N, *et al.* Percutaneous drainage versus emergency cholecystectomy for the treatment of acute cholecystitis in critically ill patients: does it matter? *World J Surg* 2011;35:826–33.
- 3 Huang CC, Lo HC, Tzeng YM, *et al.* Percutaneous transhepatic gall bladder drainage: a better initial therapeutic choice for patients with gall bladder perforation in the emergency department. *Emerg Med J* 2007;24:836–40.
- 4 Niemeier DW. Acute free perforation of the gall bladder. *Ann Surg* 1934;99:922–4.
- 5 Menakuru SR, Kaman L, Behera A, *et al.* Current management of gallbladder perforations. *ANZ J Surg* 2004;74:843–6.
- 6 Stefanidis D, Sirinek KR, Bingener J. Gallbladder perforation: risk factors and outcome. *J Surg Res* 2006;131:204–8.
- 7 Singh K, Sing A, Vidyarthi SH, *et al.* Spontaneous intrahepatic type II gallbladder perforation: a rare cause of liver abscess—case report. *J Clin Diagn Res* 2013;7:2012–14.
- 8 Kim HJ, Park SJ, Lee SB, *et al.* A case of spontaneous gallbladder perforation. *Korean J Int Med* 2004;19:128–31.
- 9 Göbel T, Kubitz R, Blondin D, *et al.* Intrahepatic type II gall bladder perforation by a gall stone in a CAPD patient. *Eur J Med Res* 2011;16:213–16.
- 10 Sharma RG, Goyal S, Mittal A, *et al.* Spontaneous perforation of acalculous gallbladder: a case report. *Indian J Surg* 2011;73:316–17.
- 11 Date RS, Thrumurthy SG, Whiteside S, *et al.* Gallbladder perforation: case series and systematic review. *Int J Surg* 2012;10:63–8.
- 12 Lo HC, Wang YC, Su LT, *et al.* Can early laparoscopic cholecystectomy be the optimal management of cholecystitis with gallbladder perforation? A single institute experience of 74 cases. *Surg Endosc* 2012;26:3301–6.
- 13 Funder KS, Steinmetz J, Rasmussen LS. Anesthesia for patients with dementia. *J Alzheimer Dis* 2010;22:S129–34.
- 14 Di Nino G, Adversi M, Dekel BG, *et al.* Peri-operative risk management in patients with Alzheimer's disease. *J Alzheimers Dis* 2012;22(Suppl 3):35–41.
- 15 Mäkelä JT, Kiviniemi H, Laitinen S. Acute cholecystitis in the elderly. *Hepatogastroenterology* 2005;52:999–1004.
- 16 Radder RW. Ultrasonically guided percutaneous catheter drainage for gallbladder empyema. *Diagn Imaging* 1980;49:330–3.
- 17 Al-Jundi W, Cannon T, Antakia R, *et al.* Percutaneous cholecystostomy as an alternative to cholecystectomy in high risk patients with biliary sepsis: a district general hospital experience. *Ann R Coll Surg Engl* 2012;94:99–101.
- 18 Li JC, Lee DW, Lai CW, *et al.* Percutaneous cholecystostomy for the treatment of acute cholecystitis in the critically ill and elderly. *Hong Kong Med J* 2004;10:389–93.
- 19 Eastman AB. Scudder oration on trauma. Wherever the dart lands: towards the ideal trauma system. *J Am Coll Surg* 2010;211:153–68.

Copyright 2014 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow