

## Images in surgery – gallstone ileus

Laurie Stiennon and Olivier Detry

Department of Abdominal Surgery and Transplantation, CHU Liege, University of Liege, Liege, Belgium

A 87-year-old woman without significant medical or surgical history was admitted to the emergency department for diffuse abdominal pain, nausea, vomiting, and constipation. On examination, her belly remained soft, moderately distended with a slight sensitivity in the left inferior quadrant. Blood tests showed inflammatory syndrome with high level of leucocytes ( $15,480/\text{mm}^3$ , normal values:  $4,6\text{--}10,1/\text{mm}^3$ ), cholestasis (total bilirubin:  $2.04\text{ mg/dL}$ , normal values:  $0.2\text{--}1\text{ mg/dL}$ ) and mild increased transaminase levels. The abdominal computed tomography (CT) demonstrated a small-bowel obstruction due to a cholelithiasis situated in the left lower quadrant (Figure 1(A)). The presence of air in the biliary tract suggested a fistula between the digestive tract and the biliary ducts, and the diagnostic of gallstone ileus (GI) was proposed (Figure 1(B)). The patient underwent a 4 cm laparotomy that allowed to explore the small intestine and to localize the gallstone (Figure 2) that was extracted through a small enterotomy (Figure 3). The patient had an uneventful postoperative course and was discharged home on postoperative day three. She was alive and well at three month follow-up.

Gallstone ileus accounts for less than 1% of small-bowel obstructions and is more frequent in elderly women [1–4]. GI is frequently preceded by an acute cholecystitis. The inflammation of the gallbladder and surrounding structures leads to adhesion formation and erosion through the gallbladder. These changes can lead to a fistula with the neighbouring structures and with further gallstone passage. The fistula between gallbladder and the duodenum is the most frequent due to their



Figure 2. Demonstration of the gallstone in the intestine.

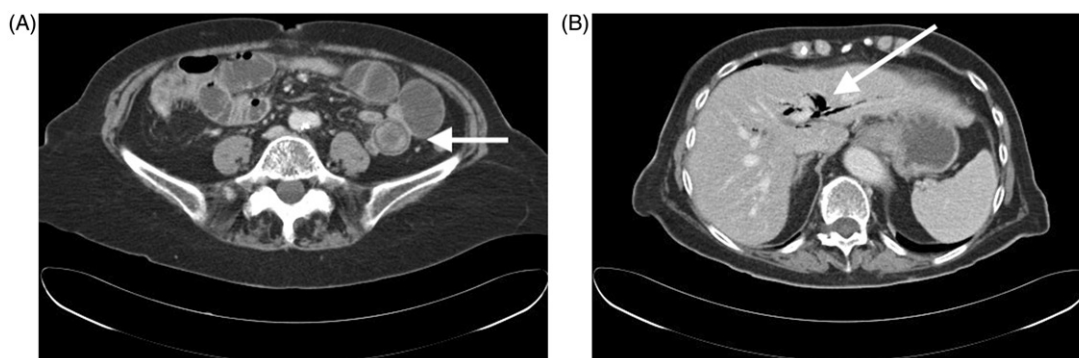


Figure 1. Abdominal CT scan demonstrating the cholelithiasis as the cause of obstruction (white arrow, panel A) and air in the bile ducts (white arrow, panel B), allowing the diagnosis of gallstone ileus.



**Figure 3.** Extraction of the gallstone through a small enterotomy.

proximity but it can also occur with the stomach, small bowel, and transverse colon [2]. The clinical presentation is usually non-specific and can be misdiagnosed due to its rarity. The patients appear often with intermittent symptoms of nausea, vomiting, pain, and abdominal distension [4]. The modern gold standard diagnostic tool is the CT scan that shows pneumobilia, intestinal obstruction, and an aberrantly located gallstone [3].

There are several options for GI surgical management, with enterotomy with stone extraction preferred for its low-incidence of complications [3]. It is also possible to propose a combination of enterotomy and stone extraction with cholecystectomy and fistula closure, or bowel resection, or even a bowel resection with fistula closure [3]. The additional surgical trauma resulting from

the cholecystectomy and fistula repair as well as the prolonged operation are potentially harmful to these high-risk patients [4–5]. Some teams advocated laparoscopic-guided enterolithotomy in selected cases. However, conversion to laparotomy is not uncommon due to the difficulty of examining a dilated small bowel and identifying the gallstone through the laparoscope [6], and the laparoscopic approach for GI management is clearly not indicated in the authors' view.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### References

- [1] Ravikumar R, Williams JG. The operative management of gallstone ileus. *Annals*. 2010;92:279–281.
- [2] Nuño-Guzmán CM. Gallstone ileus, clinical presentation, diagnostic and treatment approach. *World J Gastrointest Surg*. 2016;8:65–76.
- [3] Dai X-Z, Li G-Q, Zhang F, et al. Gallstone ileus: case report and literature review. *World J Gastroenterol*. 2013;19:5586–5589.
- [4] Ayantunde AA, Agrawal A. Gallstone ileus: diagnosis and management. *World J Surg*. 2007;31:1292–1297.
- [5] Rodríguez-Sanjuán JC, Casado F, Fernández MJ, et al. Cholecystectomy and fistula closure versus enterolithotomy alone in gallstone ileus. *Br J Surg*. 1997;84:634–637.
- [6] Halabi WJ, Kang CY, Ketana N, et al. Surgery for gallstone ileus: a nationwide comparison of trends and outcomes. *Ann Surg*. 2014;259:329–335.