



Case 14613

Cholecystoduodenal fistula with migrated gallstone leading to gastric outlet obstruction: Bouveret's syndrome

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Section: Abdominal Imaging

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Patient: 85 year(s), female

Clinical History

A 85-year-old woman presented with weight loss, abdominal pain, nausea and vomiting since several weeks. Physical examination revealed tenderness in the right upper quadrant. Blood analysis showed a normal white blood cell count ($5.2 \times 10^3/\mu\text{l}$) and a slightly elevated C-reactive protein (14.0 mg/l). Liver function tests were normal.

Imaging Findings

Computed tomography (CT) of the abdomen showed a laminated gallstone in the neck of the gallbladder causing outlet obstruction, air in the gallbladder lumen, inflammatory thickening of the gallbladder and adjacent duodenum wall, and a large laminated gallstone in the gallbladder body protruding into the duodenal bulb (Fig. 1 A, B and C). Upper gastrointestinal series showed contrast

medium surrounding the gallstone, indicating a gastroduodenal fistula, with impaction of a large gallstone in the duodenal bulb and delayed gastric emptying (Fig. 2 A and B).

Oesophagogastroduodenoscopy showed a large stone in the duodenal bulb.

Discussion

Cholecystoduodenal fistula with gallstone migration leading to intestinal obstruction is a rare complication of gallstone disease. Gallstone disease with associated chronic inflammation of the biliary system and adjacent bowel wall may cause local ischemia and necrosis of adherent walls, resulting in fistula formation. The gallstone may migrate into the bowel lumen [1]. In most patients with biliary-enteric fistula, the fistula communicates with the duodenum and stones, usually less than 2.5 cm, will pass spontaneously without causing bowel obstruction. Larger stones may result in bowel obstruction [2]. In descending order of frequency, the gallstone may be lodged in the terminal ileum, proximal ileum, distal jejunum, colon, and duodenum or stomach. When the gallstone lodges in the duodenum or stomach leading to gastric outlet obstruction it is named Bouveret's syndrome (occurring in 1-3% of gallstone ileus) [3].

Bouveret's syndrome occurs more frequently in elderly women with a history of biliary disease. The clinical symptoms may be nonspecific including nausea and vomiting, abdominal pain, hematemesis, anorexia and recent weight loss [2, 4]. Early diagnosis is important because the mortality rate is high [1].

Radiographic features of gallstone ileus are the classical Rigler's triad consisting of pneumobilia, dilated bowel loops and an ectopic gallstone. This triad is easily recognized on contrast-enhanced CT [5]. In this case, CT shows pneumobilia and a large ectopic gallstone protruding into the duodenal bulb causing gastric outlet obstruction. CT is the preferred imaging method for the diagnosis of Bouveret's syndrome [3]. Other imaging methods are ultrasonography, MRCP and oesophagogastroduodenoscopy, with the latter being both diagnostic and therapeutic [3].

A minimal invasive approach such as endoscopic stone removal has been proposed as a first-line treatment of Bouveret's syndrome. However the success rate of endoscopic treatment is low [3, 4, 5]. Therefore, surgery remains the mainstay of treatment. There are two main surgical approaches. In this case, urgent cholecystotomy with stone removal and closure of the gallbladder wall was performed. The cholecystoduodenal fistula was left unchanged. A cholecystectomy and fistula closure will be planned at a later date. This two-staged procedure is the preferred strategy for patients in a critical condition or with significant comorbidities. The other approach is a one-stage procedure, which combines enterolithotomy, cholecystectomy, and fistula closure [5].

Bouveret's syndrome represents an unusual variant of gallstone ileus. Bouveret's syndrome should be considered in the differential diagnosis in patients with gallstone disease presenting gastric outlet obstruction.

Final Diagnosis

Bouveret's syndrome

Differential Diagnosis List

Causes of gastric outlet obstruction: Malignant tumor (gallbladder carcinoma; cholangiocarcinoma;

adenocarcinoma of the duodenum and pancreas; GIST; lymphoma; metastasis); Benign mass (gastric bezoar); Inflammatory disorder (peptic disease; Crohn's disease), Causes of pneumobilia: Infectious disease (cholangitis; emphysematous cholecystitis; liver abscess); Biliary-enteric fistula (peptic disease; traumatic; malignant)

Figures

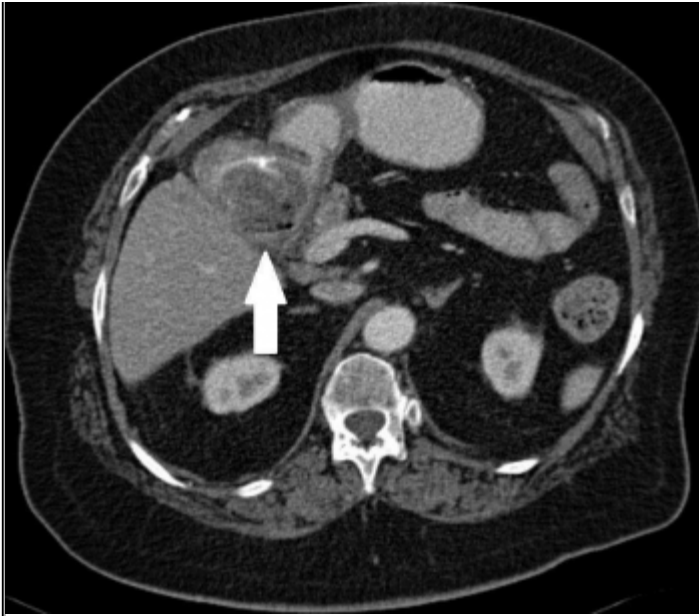
Figure 1 Computed tomography image showing Rigler's triad



Contrast-enhanced axial CT image shows subtle gastric distention secondary to impaction of a gallstone in proximal duodenum. A stone is noted in the neck (open arrow), and in the body of the gallbladder (closed arrow).

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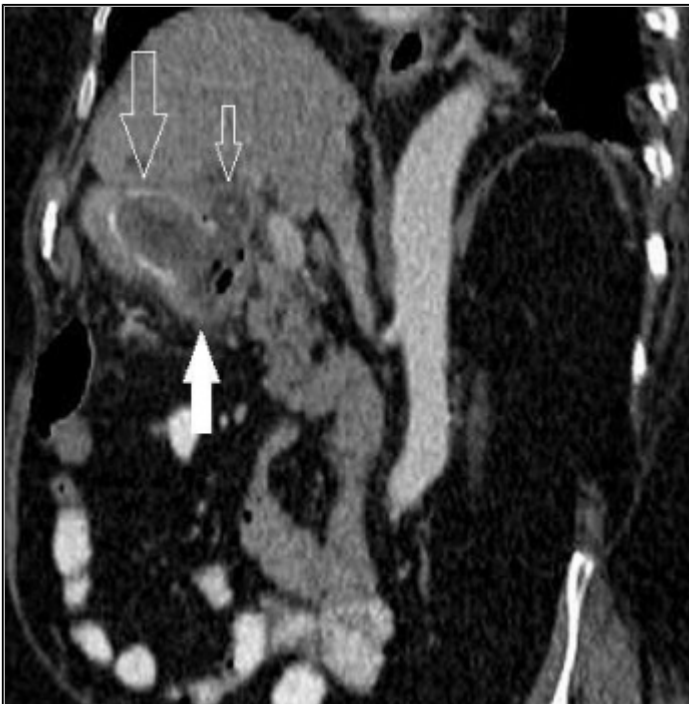
Area of Interest: Abdomen;
Imaging Technique: CT;
Procedure: Diagnostic procedure;
Special Focus: Fistula;



Contrast-enhanced CT image obtained caudal to A shows pneumobilia in a partially contracted gallbladder. The gallbladder seems to communicate directly with adjacent duodenum and a large laminated gallstone is abutting the duodenal bulb (arrow).

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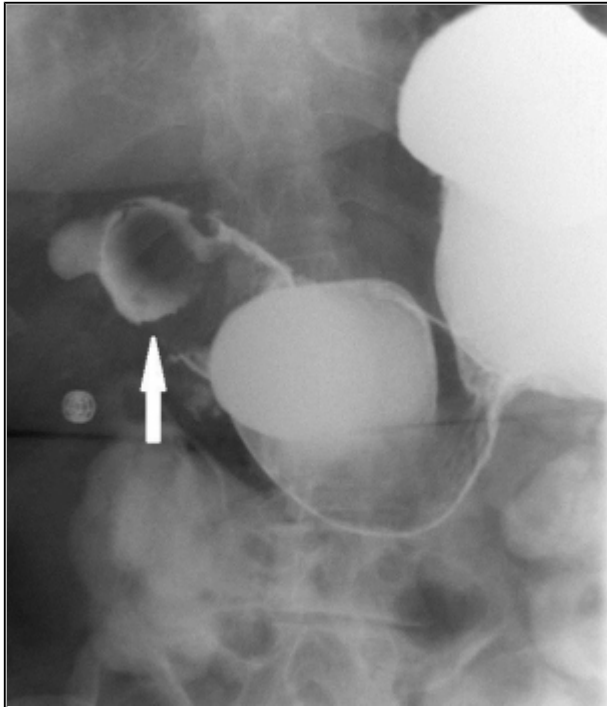
Contrast-enhanced oblique reformatted CT image shows stone in the neck (small open arrow) and body (large open arrow) of the gallbladder. Adjacent a cholecystoduodenal fistula with stone migration into the duodenum is noted (closed arrow).

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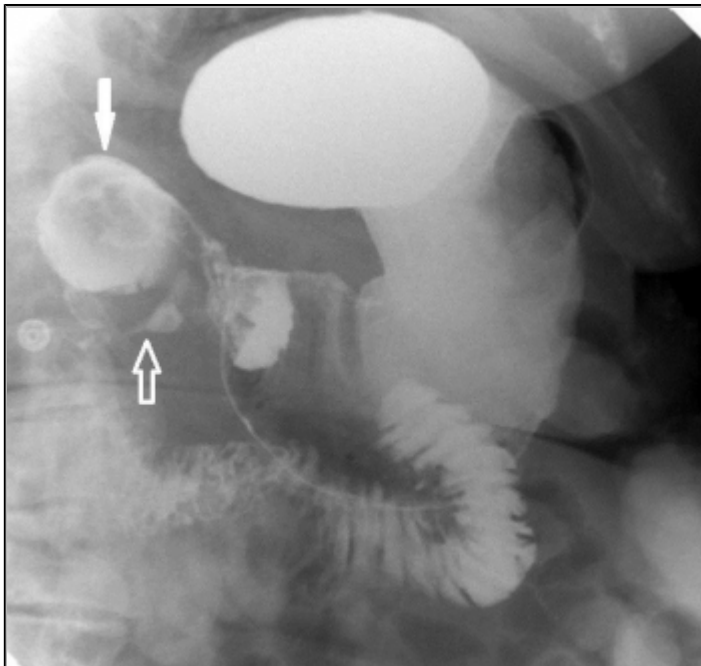
Figure 2 Upper gastrointestinal series.



Upper gastrointestinal series show a large stone surrounded by contrast agent in duodenal bulb, resulting in partial gastric outlet obstruction (arrow).

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Upper gastrointestinal series show a cholecystoduodenal fistula and partial filling of the

gallbladder (open arrow). The filling defect in the gallbladder is caused by a gallstone (closed arrow).

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Citation

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