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Bowel Obstruction Secondary to Gallstone Ileus: A Diagnostic Challenge - Case Report

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ABSTRACT

Biliary ileus is an unusual cause of intestinal occlusion in the general population (<5%), secondary to the impaction of a biliary stone in the digestive tract due to the presence of a bilioenteric fistula, a rare complication of cholelithiasis. A 65-year-old woman with intestinal occlusion secondary to biliary ileus, diagnosed by abdominal computed tomography, underwent open enterolithotomy. Post-surgery, the patient's symptoms resolved without complications. The treatment objective for biliary ileus is to relieve the obstruction, typically through enterolithotomy, although there is no definitive standardized surgical technique. This case report includes a brief literature review.

KEYWORDS: Gallstone ileus, bowel obstruction, cholelithiasis. biliary-enteric fistula, surgical management

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INTRODUCTION

Biliary ileus is a rare complication of cholelithiasis, causing mechanical intestinal obstruction (<5%) due to the impaction of large gallstones within the gastrointestinal tract. This occurs when a gallstone passes from the bile ducts into the intestinal lumen through a bilioenteric fistula, most commonly between the gallbladder and the duodenum. Once the gallstone enters the intestinal lumen, it can cause obstruction, usually at the distal ileum. Biliary ileus represents 0.2-0.5% of gallbladder disease complications and is more common in women (3:1) and older adults. Approximately 50% of cases report a history of biliary pathology.

CASE REPORT

A 65-year-old woman was admitted to the emergency room with intestinal occlusion. Her medical history included three cesarean sections and recurrent biliary colic due to cholelithiasis. She reported a 48-hour history of generalized colicky abdominal pain, predominantly in the epigastrium and right flank (pain scale 9/10), accompanied by oral intolerance, vomiting with gastrobiliary characteristics, and inability to evacuate. Laboratory studies (Table 1) showed leukocytosis with a left shift, elevated acute inflammation markers, and hyperlactatemia.

Table 1
Laboratory investigations at admission.

Parameters	Results	Reference Ranges
WBC	13.1	4.0–10.0 × 10^3/uL
RBC	5	4.5–5.5 × 10^6/uL
Hgb	17.5	13.0–17.0 gm/dL
Hct	51.1	40.0–50.0%
MCV	91	83.0–101.0 fL

MCH	35	27.0–37.0 pg
MCHC	34.1	31.5–34.5 gm/dL
RDW-CV	13	11.6–14.0%
Platelets	390	150–450 × 10^3/uL
MPV	12	9.7–13.2 fL
PDW	9.8	9.4–10.6 fL
Neutrophil Auto %	83	50–70%
Lymphocyte Auto %	17.2	20–40%
Monocyte Auto %	6.7	0.0–15.0%
Eosinophil Auto %	0.1	0.0–6.0%
Basophil Auto %	0.1	0.0–2.0%
PT	11	9.4–12.5 s
INR	1.21	1.0–1.2
APTT	35	29.1–36.5 s
Urea	7.5	2.5–7.8 mmol/L
Creatinine	77	62–106 umol/L
Sodium	138	133–146 mmol/L
Potassium	4.7	3.5–5.5 mmol/L
Chloride	105	95–108 mmol/
Calcium	2.1	1.6–3.24 mmol/L
Phosphorus	1.4	0.80–1.50 mmol/L
Magnesium	0.89	0.70–1.00 mmol/L
Bilirubin T	11	0–21 umol/L
Bilirubin D	4	0– 5 umol/L
Total Protein	77	60–80 gm/L
Albumin	43	35–50 gm/L
ALK phosphate	67	40–129 U/L
ALT	34	0–41 U/L
AST	36	0–40 U/L
Glucose	5	3.3–5.5 mmol/L
HbA1c	4.7	< 5.7%
CRP	22	0.0–5.0 mg/L
Lactic Acid	3.8	0.5–2.2 mmol/L

Abbreviations: White Blood Cells (WBC), Red Blood Cells (RBC), Hemoglobin (Hgb), Hematocrit (Hct), Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH), Mean Corpuscular Hemoglobin Concentration (MCHC), Red Cell Distribution Width-Coefficient of Variation (RDW-CV), Platelets (PLT), Mean Platelet Volume (MPV), Platelet Distribution Width (PDW), Prothrombin Time (PT), International Normalized Ratio (INR), Activated Partial Thromboplastin Time (APTT), Total Bilirubin (Bilirubin T), Direct Bilirubin (Bilirubin D), Alkaline Phosphatase (ALK Phosphate), Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST), Glycosylated Hemoglobin (HbA1c), C-Reactive Protein

Abdominal X-ray (Figure 1) and abdominal computed tomography (Figure 2a and 2b) were performed. Surgical management via exploratory laparotomy was decided, revealing a mechanical intestinal occlusion 10 cm from the ileocecal valve (Figure 3a). A longitudinal enterolithotomy was performed distal to the obstruction site (Figure 3b), with a 4x4 cm ovoid bile duct stone being removed. Primary longitudinal closure was performed in one plane (Figure 3c). The patient was admitted to postoperative care and discharged with an adequate clinical evolution.

Figure 1 Abdominal X-ray: dilated bowel loops with coin stack image and rounded radiopaque image at the level of the pelvic hollow.

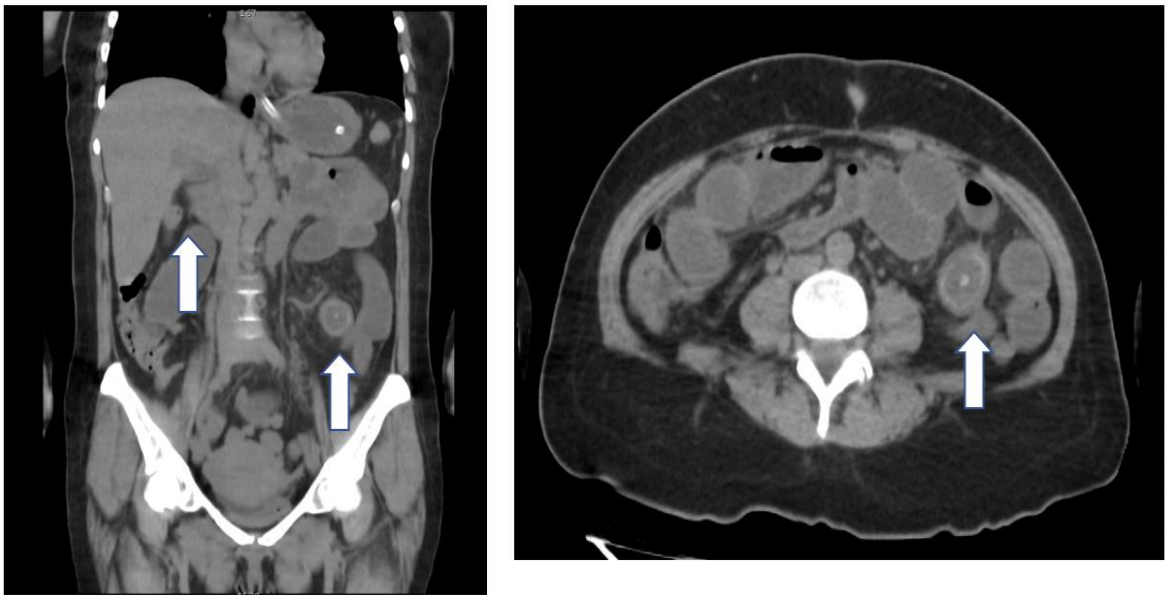

Figure 2: a) Coronal CT: Close relationship of gallbladder with small intestine, presence of biliary lithoid b) Axial CT: biliary lithoid 40mm in diameter, distended intestinal loops and presence of hydroaereal levels.

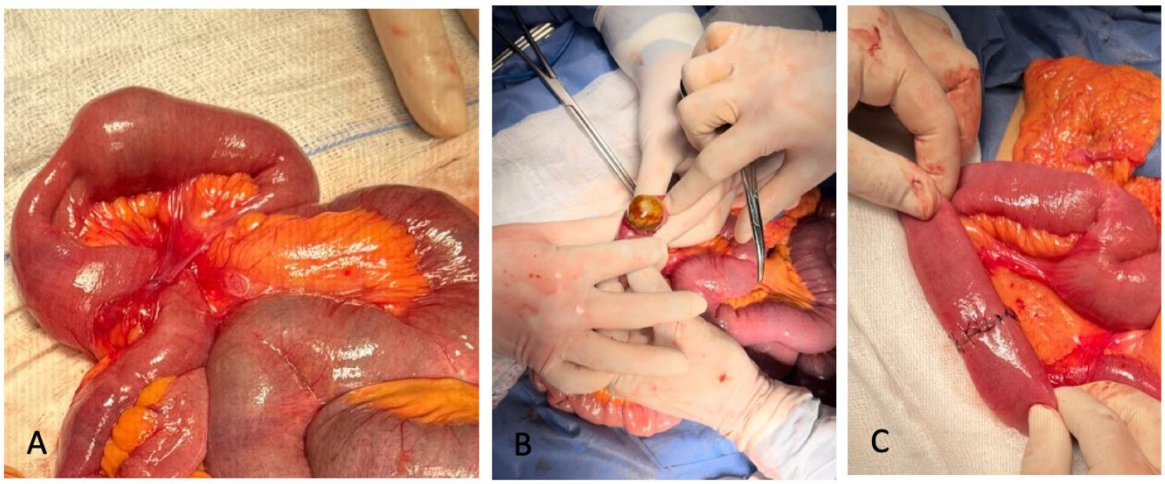

Figure 3: A) presence of bile duct at 10cm from ileocecal valve with presence of dilated bowel loops proximal to occlusion site B) Enterolithotomy with 40mm ovoid ductal duct outflow C) primary closure in one plane

DISCUSSION

Biliary ileus is a serious complication of cholelithiasis, described for the first time in 1654 by Bartholini (1,2). It occurs when one or several gallstones pass into the gastrointestinal tract through an enterobiliary fistula, representing a mechanical obstruction of the gastrointestinal tract. The male: female ratio is approximately 3.5:1, the average age is 65 years (3).

Enterobiliary fistula appears when recurrent episodes of acute cholecystitis or chronic inflammatory processes in the biliary tract occur, which can be observed in malignant tumors, biliary surgery, duodenal ulcers or inflammatory bowel disease (4-6). The surface of the intestinal serosa adjacent to the gallbladder becomes inflamed and adherent. Inflammation and the presence of a large gallstone cause segmental ischemia, which progresses to necrosis producing a cholecystoenteric fistula. (7). Among the most frequent locations of biliodigestive fistulas due to stones are: cholecystoduodenal (up to 76%) cholecystocolonic (up to 17%) and cholecystogastric fistula (8). The previous history of acute cholecystitis in patients who present enterobiliary fistula ranges from 27-28%, after the stone passes into the gastrointestinal tract, it can be impacted by narrowing of the intestinal lumen, triggering a process of mechanical intestinal obstruction (16).

The clinical presentation of biliary ileus is usually non-specific, which contributes to the delay in diagnosis, some of the symptoms present secondary to mechanical intestinal occlusion are intermittent abdominal pain, nausea, vomiting and intestinal occlusion symptoms (9). Sometimes the main symptom is "migration pain" known as the drooping phenomenon. Rigler's triad for the diagnosis of biliary ileus of any location is seen on plain abdominal radiography in 14%, however, it has been shown that Rigler's triad is present in less than 50% of patients with biliary ileus, so the use of other imaging modalities such as abdominal ultrasound and computed tomography (CT) is chosen for early diagnosis. The use of computed tomography has been widely accepted as the test of choice for bowel obstruction, as it is very effective in determining the cause of the obstruction (10).

Between 8%-17% of bilioenteric fistulas are diagnosed by preoperative imaging and are usually best seen with MRCP, although pneumobilia may be an indication on ultrasound or CT(11).

The site of gallstone impaction can be anywhere in the gastrointestinal tract, but the most common locations of gallstone impaction are ileum ends / ileocecal valve (61.7%), jejunum (34%), duodenum (Bouvaret's syndrome when impaction produces gastric outlet obstruction) and other locations (25%), finding a gallstone (78%) with a size >3cm (75%) (12, 13). The choice of surgical procedure remains a matter of debate, for the most frequently performed surgical treatment is enterotomy with removal of the litho (62%), enterotomy with removal of the litho plus cholecystectomy with fistula closure (19%), intestinal resection (15%) and intestinal resection with fistula closure (4%) (14). Enterolithotomy alone or followed by a two-stage deferred treatment is the preferred option offering low mortality and a reduced risk of recurrence (14). Recently, closure of enterobiliary fistulas has been performed through robotic surgery offering advantages including ease of maneuvering, 3D visualization, better access to small spaces and improved control (15) Spontaneous removal of gallstones has been reported in a Japanese review (8 of 112 patients). The recurrence rate of biliary ileus after simple entero lithotomy is about 5%

CONCLUSION:

Biliary ileus is a challenging clinical entity to diagnose, requiring a high index of suspicion. Imaging studies, particularly abdominal CT, have improved diagnostic accuracy and informed therapeutic decisions. Treatment should be individualized, considering patient comorbidities, with single-stage procedures reserved for select cases.

PATIENT CONSENT

The consent for publication was obtained from the patient.

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DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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