

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Medical Imaging Quiz – Case 56

A 55-year-old man presented to the emergency department due to acute colicky abdominal pain and high fever. He referred suffering from mild abdominal pain and nausea the last three months. Physical examination revealed temperature of 40 °C, pulse rate: 100/min, respiratory rate: 16/min, blood pressure: 130/95 mmHg and positive Murphy sign. An abdominal computed tomography (CT) was performed and revealed a round shaped hypodense mass in the jejunum with surrounding oedema (fig. 1). Patient was admitted to the surgical clinic for clinical observation. Twelve hours later due to signs and symptoms of abdominal obstruction he underwent a second CT which revealed ileus and the hypodense mass transferred and located to the ileum (fig. 2).

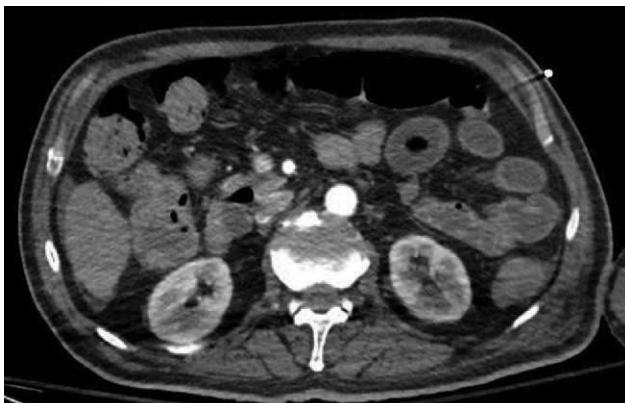


Figure 1. Abdominal computed tomography (CT) revealing hypodense mass (gallstone) in the jejunum with edema and obstruction.



Figure 2. Abdominal computed tomography (CT) 12 hours later revealed ileus (dilated small bowel loops) and the round-shaped hypodense mass (gallstone) transferred in the ileum.

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Comment

Gallstone ileus is an uncommon cause of a mechanical small bowel obstruction with constant incidence of 30–35 cases/1,000,000 admissions. This entity develops in 0.3–0.5% of patients with cholelithiasis. Gallstone ileus has been observed with a higher frequency among the elderly patients.

Gallstone ileus is frequently preceded by an initial episode of acute cholecystitis. The inflammation in the gallbladder and surrounding structures leads to adhesion formation. The inflammation and pressure effect of the offending gallstone causes erosion through the gallbladder wall, leading to fistula formation between the gallbladder and the adjacent and adhered portion of the gastrointestinal tract, with further gallstone passage. The most frequent fistula occurs between the gallbladder and the duodenum, due to their proximity. Less commonly, a gallstone may enter the duodenum through the common bile duct and through a dilated papilla of Vater.

Typically, presentation of gallstone ileus may be preceded by a history of prior biliary symptoms, with rates between 27–80% of patients. Acute cholecystitis may be present in 10–30% of the patients at the time of bowel obstruction. Biliary symptoms may be absent in up to one third of cases. Gallstone ileus can acutely present as colicky abdominal pain and gastrointestinal obstruction.

Physical examination may be nonspecific. The patients are often acutely ill, with signs of dehydration, abdominal distension and tenderness with high-pitched bowel sounds and obstructive jaundice. Fever, toxicity and physical signs of peritonitis may be noted if perforation of the intestinal wall takes place. The exam may be completely normal if no obstruction is present at the moment.

Most frequently, stones become impacted in the distal ileum, although they may become lodged at other locations such as terminal ileum, proximal ileum, jejunum, colon, duodenum/stomach, leading to gastric outlet obstruction (Bouveret syndrome).

Plain abdominal radiographs are of major importance in establishing the diagnosis. In 1941, Rigler described four radiographic signs in gallstone ileus: partial or complete intestinal obstruction, pneumobilia or contrast material in the biliary tree, an aberrant

gallstone and change of the position of such gallstone on serial films. The presence of two of the three first signs has been considered pathognomonic and has been found in 20–50% of cases (Rigler triad).

CT is considered superior to plain abdominal films or ultrasonography (US) in the diagnosis of gallstone ileus cases, with an overall sensitivity, specificity and accuracy around 93%, 100%, and 99%, respectively. The frequency of Rigler's triad detection is higher under CT examination.

Since only the minority of gallstones calcify (12.5%), and their density is similar to regular bowel content, it is easy to overlook the offending gallstone. There may be bulging of the bowel just before the transition point which may be helpful in locating the gallstone. CT scan may allow detection of a rim or totally calcified ectopic gallstone without oral contrast administration. This may be done even with non-enhanced CT. Identification of a rim-calcified gallstone may be more difficult with contrast-enhanced CT, compared to total calcified gallstones. Less calcified gallstones could be missed. Typically, stones are large and measure several centimeters (2–3 cm). Additionally, the site of fistulisation is often visible. Contrast-enhanced CT allows detection of edema and ischemia of the affected gastrointestinal tract site. Given the relevance of possible bowel ischemia, contrast-enhanced CT is of particular importance in management decision making.

The main therapeutic goal is relief of intestinal obstruction by extraction of the offending gallstone. Fluid and electrolyte imbalances and metabolic derangements due to intestinal obstruction, delayed presentation and pre-existing co-morbidities are common, and require management prior to surgical intervention.

There is no consensus on the indicated surgical procedure. The current surgical procedures are: simple enterolithotomy, enterolithotomy, cholecystectomy and fistula closure (one-stage procedure) and enterolithotomy with cholecystectomy performed later (two-stage procedure). Bowel resection is necessary in certain cases after enterolithotomy is performed. Due to the demographics

of the population affected (elderly) this condition continues to have a high mortality (12–30%).

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