

# Gall Stone Ileus: A Rare Complication of Gallstone Disease. Case Report and Literature Review

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## Abstract

Gallstone ileus is a rare complication of gall stones associated with high morbidity and mortality. Misdiagnosis is common. The condition should be suspected in all patients presenting with features of small-bowel obstruction in absence of a surgical scar and external hernia, especially in elderly females. The diagnosis can always be confirmed by plain X-ray, ultrasound and CT scan demonstrating Rigler's triad. Surgical treatment involves removal of the impacted stone with immediate or delayed dealing with the fistula.

## INTRODUCTION

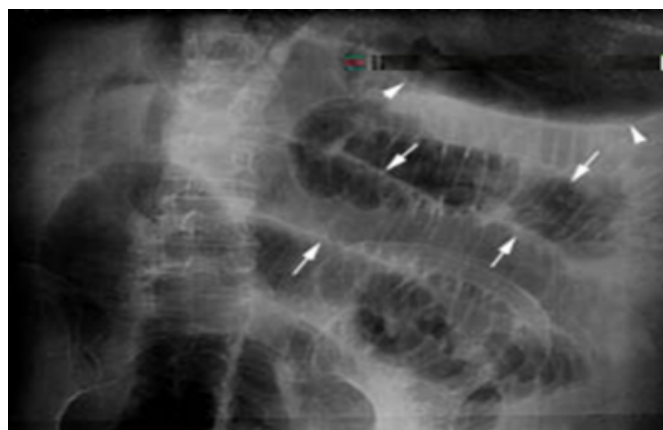
Gallstone ileus is a rare complication of gallstones that occurs in 0.5% of all cases of bowel obstruction and in up to 25% of cases of non-strangulated small-bowel obstruction in patients over 65 years of age. We report a case of small-bowel obstruction diagnosed preoperatively as gallstone ileus, discussing the diagnostic features of the disease and reviewing the literature.

## CASE REPORT

A 61-year-old man was admitted to the surgical ward at King Abdelaziz Military Hospital, Tabuk, KSA with a 10-day history of being unwell. Three days before the admission he developed intermittent attacks of colicky abdominal pain associated with abdominal distention, vomiting and diarrhea. He was not known to have gall stones but he gave a history of chronic dyspepsia for few months prior to admission. On examination, he was slightly dehydrated. His pulse rate was 106/minute. Blood pressure and temperature were normal. The abdomen was distended, soft and lax and the bowel sounds were exaggerated. There were no scars of surgery or external hernia. Full blood count, urea and electrolytes were within normal limits. Plain x-ray of the abdomen showed dilated loops of small bowel associated with air in the gall bladder and biliary tree. (Figures 1 and 2)

**Figure 1**

Figure 1: Plain x-ray showing dilated loops of small bowel.



**Figure 2**

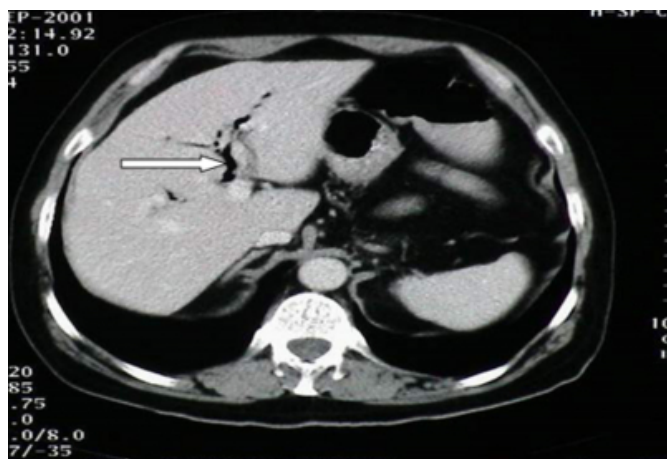
Figure 2: Plain x-ray showing air in the biliary tree



Diagnosis of gallstone ileus was made on a clinical basis and the plain x-rays findings and was confirmed by CT scan which showed two radio-opacities in the jejunum in addition to the air in the biliary tree, the biggest of them was almost completely obstructing the lumen (Figures 3 and 4).

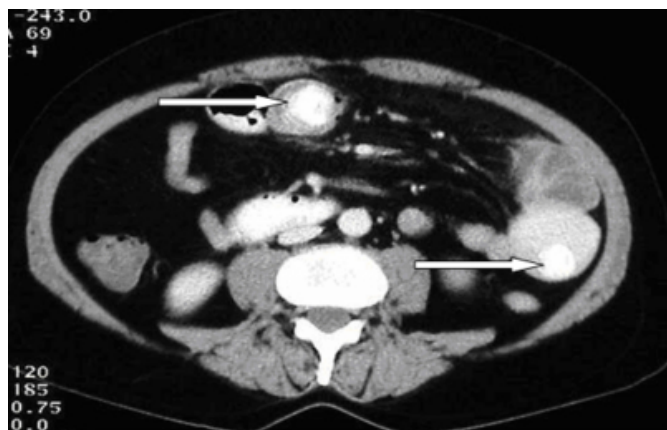
**Figure 3**

Figure 3: CT confirming the air in the biliary tree (the arrow).



**Figure 4**

Figure 4: CT showing 2 stones (arrows), one impacted in the distal jejunum and one floating in the proximal jejunum.



After initial fluid resuscitation, the patient was taken for exploratory laparotomy. At laparotomy, two stones were found in the jejunum: a bigger stone measuring about 3.5cm in diameter was found impacted in the jejunal lumen, approximately 50cm from the duodenojejunal flexure, and a smaller one measuring about 1.5cm in diameter was found floating freely in the proximal dilated loop of jejunum. The impacted stone was milked distally and removed through a small enterotomy made in the antimesenteric border of the jejunum (figures 5 and 6). The smaller stone was easily removed through the same enterotomy. The

cholecystoduodenal fistula was left undisturbed.

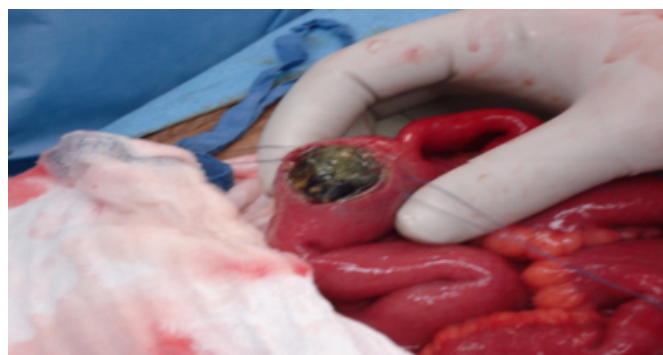
**Figure 5**

Figure 5 showing the stone impacted in the jejunum



**Figure 6**

Figure 6: Removal of the stone through an enterotomy



## DISCUSSION

Gallstone ileus is a rare complication of gallstones. It accounts only for 1% to 3% of all causes of intestinal obstruction and up to 25% of cases of non-strangulated small-bowel obstruction in patients over 65 years of age (1, 2, 3, 4, 5, and 6). Fistulation of the stone occurs spontaneously through the wall of the gall bladder into the bowel. Some cases of gallstone ileus were reported following endoscopic retrograde cholangiopancreatography and sphincterotomy (7, 8). The most common locations of biliary-enteric fistula, in decreasing order of incidence are: cholecystoduodenal, cholecystocolonic, cholecystogastric and choledochoduodenal (9). Impaction of the stone can occur at any part of bowel but it most frequently occurs in the terminal ileum and the ileocecal valve because of their narrow lumen and potentially less active peristalsis. Gastric outlet obstruction due to a cholecystoduodenal fistula and impaction of a gallstone in the duodenum was first reported by Bouvert in 1896 and was named after him (10). Fistulation through the colon is usually followed by spontaneous passage and evacuation of the stone (11);

however, there are few reports of large-bowel obstruction caused by gallstones (12). Chatterjee et al. reported a case of gall stone ileus with impaction of the stone at the duodeno-jejunal flexure (13).

Bowel obstruction is usually caused by impaction of a single stone, but multiple stones in the intestine are found in 3% to 15% of patients (14). The clinical symptoms of gallstone ileus are non-specific. It is primarily a disease of elderly women (15). Diagnosis depends on a high index of suspicion and should be considered in elderly patients, especially females, who present with small-bowel obstruction, history of previous cholelithiasis and absence of abdominal scars or external hernia. In 1941, Rigler described a triad for diagnosis of gallstone ileus which is characterized by the association of an ectopic gallstone, partial or complete bowel obstruction, and gas in the gallbladder or the biliary tree (16).

Plain films remain the first step in the evaluation of patients with suspected gallstone ileus with a sensitivity varying from 40 to 70% (17). Plain x-ray of the abdomen may be helpful if it reveals features of intestinal obstruction, shows a calcified gallstone in the intestinal lumen or air in the biliary system. Pneumobilia is present in only one third of cases and recognition of gallstones in the intestinal lumen depends upon the density of calcium in the stone (18, 19).

Ultrasound may provide a definitive diagnosis of gallstone ileus and obviate the need for further tests. The presence of gas in the gallbladder and biliary tree is striking and at times it is possible to trace a dilated loop of small bowel to the obstructing calculus and to identify the exact site of the obstruction (20). CT is increasingly used in cases of small-bowel obstruction to look for features of ischaemia and strangulation and to seek evidence of an underlying inflammatory mass (21). CT provides all of the specific findings of gallstone ileus that are incompletely and infrequently demonstrated by plain abdominal radiography or by ultrasound including cholecystoduodenal fistula and the intraluminal gallstone in the bowel, even when not heavily calcified (22). From the practical perspective, plain abdominal films demonstrate small-bowel obstruction, ultrasound shows biliary tract pathology and CT makes the final diagnosis (23, 24).

As gallstone ileus carries a significant rate of complications with a mortality rate ranging from 12% to 27% in most series reported (25), early diagnosis and prompt treatment is rewarded by better prognosis. Most of the patients are old

with concomitant diseases, especially cardio-respiratory disease, which require special preoperative attention. Fluid and electrolyte imbalance should always be corrected before surgery.

Although previous reports suggested primary surgical intervention is mandatory for all cases with gallstone ileus (26), Chih-Yung et al. proposed that when prospective CT estimation of the size of an ectopic gallstone yields less than 2 cm, the patients should receive conservative treatment with constant monitoring of vital signs until complete clinical recuperation. If conservative measures affected resolution of gallstone ileus accordingly, better prognosis could be achieved especially in elderly and debilitated patients (27, 28).

Surgical treatment involves removal of the stone through small enterotomy with or without simultaneous cholecystectomy and repair of the fistula. Since the migration of two or more gallstones is possible, inspection of all intestinal segments during surgery is recommended.

There is a lot of controversy in regard to the true need to reach the cholecystenteric fistula during initial operative procedures (25, 30, 31&32).

Many studies compared between surgical management of patients with gallstone ileus by either simple enterotomy or one-stage procedure with urgent fistula closure, but unfortunately, due to the rarity of the condition, most of these studies included a small number of patients.

Doko et al. compared simple enterotomy to one-stage procedure with urgent fistula closure in 30 patients, 11 of them treated with enterostomy alone (group 1) and 19 treated with one stage procedure with urgent closure of the fistula (group 2). He found that the operating time was significantly longer for the one-stage procedure. Complications occurred in 27.3% from group 1 and 61.1% from group 2. One patient in group 1 and two patients in group 2 died. He concluded that simple enterotomy should be the procedure of choice for patients with gallstone ileus. The one-stage procedure including urgent fistula repair should be reserved only for highly selected patients with absolute indications (33).

Ayantunde retrospectively studied 22 cases of gallstone ileus treated at Nottingham City Hospital, United Kingdom, in the period between January 1998 and December 2005. He concluded that management of gallstone ileus must be individualized. The one-stage procedure should be offered

only to highly selected patients with good cardiorespiratory reserve and with absolute indications for biliary surgery at the time of presentation (34).

Evidence from another study from Spain including 25 patients where simple enterotomy was done in 16 of them and one-stage procedure was done in the remaining 9 does not support one-stage enterolithotomy, cholecystectomy and fistula closure as the procedure of choice. It recommended that simple enterolithotomy is appropriate in most patients (35).

In a survey of 112 cases of gallstone ileus reported in the Japanese literature (till 1980) there was no operative mortality in seven patients treated with enterolithotomy, subsequent cholecystectomy and repair of the fistula, whereas a mortality rate of 19 percent followed the one-stage procedure in the remaining patients (36).

On the other hand, Pavlidis et al. studied 9 patients with gallstone ileus. Three of them were treated with simple enterotomy and 9 with enterotomy and primary closure of the fistula. He concluded that that a one-stage procedure (enterolithotomy plus fistula repair and cholecystectomy), when feasible, should be the first choice. Enterolithotomy alone should be reserved for only unstable and difficult cases (37).

In presence of wide diversity of opinions it is wiser to tailor the surgical approach for each individual patient taking in consideration the patient's general condition, age and presence or absence of risk factors.

Both laparoscopically assisted and totally laparoscopic approaches were used for management of gallstone ileus (38, 39). There are also reports of using simple endoscopic lithotomy, Laser lithotripsy either with percutaneous or transendoscopic routes and extracorporeal shock-wave lithotripsy (ESWL) in management of impacted stones (40, 41).

The mortality rate is ranging from 12% to 27% in most series reported (25). High morbidity and mortality rates could be attributed to delayed diagnosis, senile patients and coexisting concomitant medical disease.

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