



Gallstone Ileus in the Elderly: Still a Challenge, Report of a Case with Review of the Current Literature

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Abstract

Introduction: Gallstone ileus is described as an intestinal obstruction caused by luminal gallstone impaction. It is a mainly geriatric disease with a prevalence of over 25 % in the elderly population. Morbidity and mortality rates are high which are caused due to the delayed presentation, diagnosis and treatment in comorbid patients. Interestingly, since the past century, the optimal surgical procedure in this type of mechanical ileus is still highly controversial and challenging.

Presentation of case: In the current paper we demonstrate our experience with a patient treated at our institution due to gallstone ileus. During surgical exploration the impacted stone in the terminal ileum was removed without performing a cholecystectomy. This decision was made because of the unstable and septic status of the patient necessitating quick relief of the obstruction and no signs of ongoing severe peritonitis and acute Cholecystitis. She had an uneventful postoperative course.

Discussion & conclusion: While enterolithotomy is performed most commonly because of the low incidence of complications, the risk of developing recurrent biliary symptoms has led to a more aggressive approach with concomitant fistula repair and cholecystectomy.

Keywords: Gallstone ileus, elderly patients, surgical therapy, decision-making

Introduction

Gallstone ileus is a rare complication which is responsible for mechanical bowel obstruction in 1-4 % of the patients. With a higher prevalence of cholelithiasis in the elderly (geriatric) predominantly female population, the incidence of gallstone ileus rises up to 25 % in this cohort [1,2]. The relatively high reported mortality and morbidity rates (12-23%) have been mainly attributed to the unspecific clinical symptoms, advanced aged patients with comorbidities and delay in diagnosis and subsequent adequate therapy [1,3,4]. Gallstone ileus is mainly treated surgically with a prompt relief of the obstruction as the primary goal of every procedure [1-3-6]. The reported one or two step surgical strategies include 1) enterolithotomy alone with optional interval biliary intervention, or 2) enterolithotomy combined

with cholecystectomy, fistula repair and possibly segmental bowel resection [7]. We present a case of gallstone ileus treated with simple enterolithotomy and report her postoperative clinical course.

Case Report

Our patient is a 62-year-old female initially admitted in a tertiary hospital with upper abdominal pain, recurrent vomiting, dehydration and respiratory deterioration. The past medical history included arterial hypertension and adipositas per magna (BMI 36 kg/m²). On examination her abdomen was distended in all 4 quadrants without signs of peritonitis. Lung auscultation was significant for rales on the left lung site. The laboratory results

showed hypokalemia and severely elevated serum creatinine/ blood urea nitrogen levels suggesting acute renal failure. The inflammatory markers were high (CRP 33,8 mg/dl, WBC 11,600/ μ l). Other blood tests including Bilirubin and LFT 's (Liver function test) were normal. An upper GI Endoscopy study revealed a duodenitis. A CT-scan was performed following further aggravation of the general health status with progredient septic pneumonia and hemodynamic instability. It demonstrated a large gallstone

in the middle third of the ileum causing small bowel obstruction and pneumobilia of the biliary system (Figure1). Subsequently the Patient was referred on the second day after admission to our department where we performed a laparotomy. At exploration no signs of an ongoing peritonitis could be seen. The large (6 cm x 3 cm) impacted Gallstone (Figures 2&3) in the ileum was removed by opening the small intestine through a 3-cm longitudinal anti-mesenteric incision at the obstruction site.

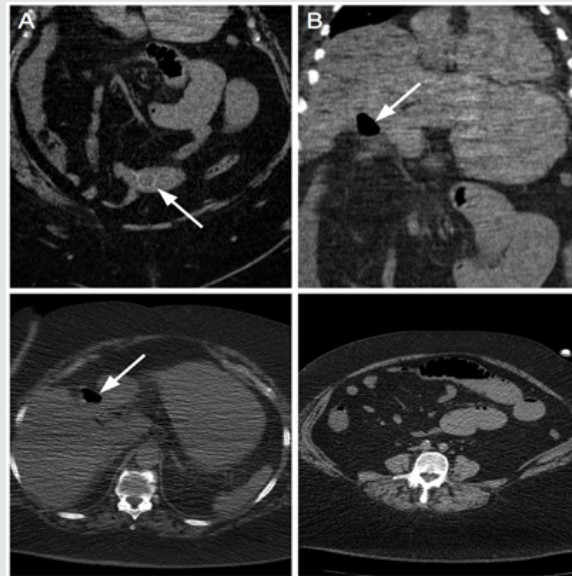


Figure 1: Computed tomography (CT) images of a 62 year-old obese woman with gallstone ileus. Coronal CT image (A) shows a 2.5 cm ectopic gallstone in the ileum. Pneumobilia of the gall bladder as seen on coronal (B) and transverse CT images (C) Distended small bowel loops caused by ileal obstruction (D) These features are consistent with Rigler's triad and their presence is pathognomonic for gallstone ileus.

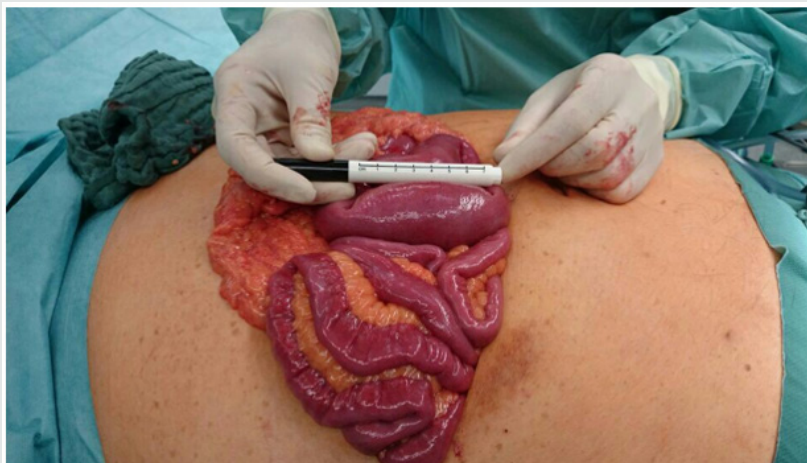


Figure 2: Intraoperative picture (ileum) demonstrating the large impacted Gallstone.



Figure 3: After enterotomy the gallstone (6cm x 3cm) is removed.

The affected bowel segment was not ischemic. Therefore, primary closure without bowel resection was performed. No other remnant stones were identified. Further exploration of the right upper quadrant revealed multiple dense adhesions between the omentum and the transverse mesocolon with the gallbladder. Because no signs of obvious severe inflammation of the surrounding tissue and the gallbladder could be elicited, further surgical exploration and cholecystectomy were not carried out with respect to the septic state of our patient. The postoperative recovery period was uneventful. Dialysis could be discontinued. Under antibiotic regimen the inflammatory parameters decreased. The patient developed an atrial fibrillation which could be managed with antiarrhythmic medication. She was discharged on postoperative day 12. A second step procedure with concomitant cholecystectomy and fistula closure down will be scheduled in a disease-free interval.

Discussion

Gallstone ileus is a potentially life-threatening condition where one or multiple migrated gallstones get impacted in the bowel lumen. Cholelithiasis accounts for approximately 1-4 % of all cases of mechanical non-strangulated bowel obstruction. This incidence rises up to 25 % in patients aged over 65 years as gallstone disease becomes more evident in the elderly [1,2,4]. The male-female ratio is 1 to 3-16 % in favor of female patients with an average age between 66-73 years at the time of presentation [4,5,8]. Many of these patients have relevant comorbidities including cardiovascular and metabolic disease which contribute to the high perioperative mortality and morbidity. The overall mortality ranges from 7 to 23 % [1,4,7,9]. Pathophysiologically recurrent chronic or acute gallbladder inflammation causes adherent bowel perforation and thus cholecystoenteric fistula formation where the stone passes into the intestine [5,8]. The stone can theoretically occlude any level of the bowel, but the terminal ileum and ileocecal valve constitute the predilection site with 54 % as the narrowest part of the small bowel with reduced peristaltic activity. Following the ileum, the jejunum and duodenum are affected in 27 % and 1-3 %. The least possible site of obstruction is the colon [1,4,8]. Symptoms of gallstone ileus are similar to those of mechanical small bowel

obstruction. They may be intermittent and variable because the stone lodges at different levels and moves downwards until its final destination of impaction. An observation called “tumbling” phenomenon [8]. These characteristics of an intermittent and incomplete obstruction in the initial stages are responsible for the delay in diagnosis and treatment leading to deterioration of the preoperative status.

The interval between onset of symptoms and the time of admission to the hospital and surgical intervention averages between 3 to 7 days [3-5, 8-11]. The perioperative diagnostic rate ranges between 13 to 50 % which means that more than half of the patients with gallstone ileus remain undiagnosed until laparotomy for suspected mechanical obstruction or at autopsy [1,3,4,10,11]. The radiographic images play an important role in the perioperative diagnosis. The rigler triad on plain abdominal films includes 1) pneumobilia 2) an ectopic gallstone and 3) distended small bowel loops. The presence of these features is pathognomonic. However, they are not seen regularly and only less than 40 % of the patients exhibit 3 or 2 criteria [4,8,10,12,13]. Plain CT- Scan shows a higher overall sensitivity (93%) and diagnostic accuracy (77-99%) in detecting ectopic gallstones, the site of bowel obstruction and the bilioenteric fistula [12,13]. The proper treatment modality in gallstone ileus is still controversially debated since the last century [1,3,5,8]. The surgical treatment strategy encompasses either enterolithotomy with optional interval cholecystectomy or a one stage combined procedure with enterolithotomy, cholecystectomy and fistula closure. The main goal of any therapy is the prompt relief of bowel obstruction and life preservation in an emergency situation. In many patients the delayed diagnosis leads to a significantly instable vital status secondary to volume depletion, peritonitis and sepsis. Therefore, a careful perioperative resuscitation management must be applied timely prior to surgery. Many investigators recommend a simple enterolithotomy as the initial surgical procedure in debilitated patients [1-5,7,10,11,14]. A short procedure time with less extensive dissection of the fragile tissue taking into account the impaired healing capacity in this group of high-risk patients is anticipated by this approach compared to the one step strategy. However the late term consequences and complications of a persistent biliary-enteric fistula (e.g. recurrent

symptomatic cholecystitis[4], cholangitis, significant increase in gallbladder carcinoma [4,5,8], malabsorption symptoms [5] and severe upper GI bleeding [4]) have led some researchers to propose a more aggressive and complex approach including enterolithotomy with concomitant cholecystectomy and fistula repair in a combined one step procedure as a feasible option [2,4-6,15].

This treatment opportunity is predominately reserved for low risk patients with less comorbidities with absolute indications for biliary surgery and after proper patient selection and perioperative resuscitation. Generally, the overall mortality rates recorded of the one-stage operation are slightly higher (17-33 %) than the enterolithotomy alone (12-19 %) although not statistically significant [1,3-5,7]. Because of its rarity, surgical outcomes of patients with gallstone ileus have only been studied retrospectively with disparities in diagnostic and treatment strategies. Which surgical procedure is performed should also be strongly adapted to the intraoperative findings [3] Careful exploration of the bilioenteric fistula and gallbladder is advised to evaluate the presence of gastrointestinal leakage, abscess or gallbladder empyema formation and additional stones [8]. While a subacutely inflamed gallbladder could be leaved untouched, acute or gangrenous cholecystitis and residual stones may warrant the one stage procedure with definitive fistula closure [3,10]. On the other side Laparoscopic surgical interventions Soto et al. [16] and a variety of non-surgical stone removal techniques e.g. endoscopic mechanical and electrohydraulic lithotripsy [17] or extracorporeal shockwave lithotripsy (ESWL) [18] have been successfully applied in selected cases but have their own limitations depending on the site of obstruction. The presented case was a younger patient with less comorbidities. Simple enterolithotomy was indicated due to a fulminant pneumogenic sepsis and renal failure requiring immediate intensive care surveillance. The choice of the surgical method was strictly adapted to the intraoperative assessment of the local conditions as described above. Careful exploration of the whole bowel should be carried out to avoid remnant gallstones causing recurrent obstruction. In the presence of residual stones the estimated recurrence rate of gallstone ileus ranges from 5 %to 17 %, mostly within 2-6 months after the first operation [19,20]. Our patient was asymptomatic during follow-up at 6 weeks, bringing a second elective operation with cholecystectomy and fistula repair down into question based on the current incongruent literature and the lack of large scale randomized clinical trials.

Conclusion

The choice of surgical procedure is strongly depended on the clinical presentation of the patient and intraoperative findings. It should balance the risk and benefits of each approach taking in account that most cases are elderly patients with comorbid conditions and subsequent debilitated general health status due to delayed diagnosis. The one stage procedure with fistula closure has a reportedly higher mortality and morbidity rate and is therefore indicated in younger low-risk patients. Nevertheless, enterolithotomy alone predisposes to the complications of persistent bilioenteric fistula including recurrent gallstone ileus,

cholangitis and cholecystitis with the necessity of a reintervention. Despite recent decreasing mortality rates and advances in the perioperative care Gallstone ileus is still a challenging and fatal disease among the elderly, a timely diagnosis and proper treatment strategy impact patient's outcome. Simple enterotomy with stone removal is recommended by many authors as the initial surgical procedure followed by a delayed second step approach if necessary.

Conflicts of interest

There are no conflicts of interest

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Ethical Approval

The Ethics Committee of the Heinrich Heine University Düsseldorf and University Hospitals Düsseldorf confirms that this Case report does not require the formal vote of its Ethics Committee based on the current laws.

Consent

An informed consent was obtained from the patient. All the patient related data and pictures were anonymised.

Author contribution

Andreas Krieg operated on the patient and contributed to the study concept and design, data acquisition, editing and critically revising the final manuscript; Sascha Vaghiri contributed to the study concept and design, data collection and analysis, writing the final manuscript, and literature review; Stephen N Fung, Dimitrios Prassas and Alexander Rehders contributed to writing of the final manuscript; Lino Morris Sawicki overwiewed the radiographic examinations and provided the CT-Images; Wolfram Trudo Knoefel critically analysed and revised the final manuscript.

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