Gallstone Ileus – A single center case series

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ABSTRACT

Introduction: Gallstone ileus is a rare complication of cholelithiasis that accounts for 1–3% of mecanic ileus of the small bowel. It is characterized by bowel obstruction secondary to gallstone impaction that results from a migration due to the existence of a bilioenteric fistula. Gallstone Ileus is more common in the elderly with more comorbidities which leads to a high morbidity rate. Consequently, a debate exists regarding the appropriate surgical strategy for emergency treatment of gallstone ileus. The aim of the present study was to evaluate different surgical approaches based on the authors’ recent experience and to analyze the clinical outcome. Case Series: Six patients were included, all females, with a mean age of 82 years. All patients had comorbidities, specially, cardiovascular diseases. Three of them had previous history of biliary pathology. Diagnosis was confirmed through computed tomography (CT) scan in five cases. The stone was in the ileum in three, jejunum in two, and duodenum in one patient; the mean stone size was 2.5 cm. Four patients were submitted proximal to enterotomy with the removal of the gallstone, one to gastrootomy and one to cholecystectomy and a cholecystoduodenal fistula closure. During the postoperative period, complications were recorded in three subjects, one patient died due to cerebrovascular accident. Conclusion: The main key in guiding patients with gallstone ileus is the timely diagnosis which is currently facilitated with the support of the use of CT scan. Taking into consideration the age and comorbidities of these patients, the surgical management should be as conservative as possible.

Keywords: Bowel obstruction, Enterolithotomy, Gallstone ileus, Intestinal obstruction

INTRODUCTION

Gallstone Ileus described first in 1654 by Thomas Bartholin is a rare disease that results from intestinal obstruction due to the migration of gallstones into the intestine lumen [1]. Gallstone Ileus is an unusual complication of cholelithiasis, occurring in less than 3% of patients who present with mechanical obstruction of the small bowel [2].

The inflammatory process associated with acute cholecystitis promotes adhesion of the gallbladder to the intestinal wall, leading to the formation of a cholecystoenteric fistula. This fistula is the mechanism for passage of a large gallstone capable of obstruction [2]. The most frequent fistula location occurs between the duodenum and gallbladder, due to their proximity. The
stomach, small bowel and the transverse portion of the colon may also be involved [1].

It is estimated that 80% of intraluminal stones will pass spontaneously [3]. Most of the gallstones smaller than 2 or 2.5 cm may pass spontaneously through the normal gastrointestinal tract and be excreted uneventfully in the stools [1]. Usually gallstones larger than 2.5 cm will most likely cause obstruction.

Gallstone Ileus is more common in the elderly, Halabi et al recently reported an age range from 60 to 84 years in American patients. The female sex is particularly affected [1].

Symptoms of Gallstone Ileus can be nonspecific, insidious, vague and intermittent which may interfere with the diagnosis. Patients usually do not seek immediate medical attention, presenting 4 to 8 days after the beginning of symptoms, and the diagnosis is usually made 3 to 8 days after the onset of symptoms [1], so this diagnosis is usually difficult to achieve and often delayed. Consequently, this is a condition with a high morbidity and mortality rate [4].

Up to 50% of cases diagnosis is only made during exploratory laparotomy. The mainstay of treatment is removal of the obstructing stone. Fluid and electrolyte imbalances and metabolic derangements may co-exist particularly in elderly patients with pre-existing co-morbidities and need prioritized addressing before surgical intervention [1]. Debate currently exists regarding the appropriate surgical strategy for emergency treatment of gallstone ileus. Most authors recommend enterolithotomy alone because of its lower morbidity, mortality and reports of spontaneous fistula closure [5]. However, an untreated biliary-enteric fistula may lead to recurrent events of Gallstone Ileus, the risk of recurrence has been reported in 5–8% of cases [3].

We describe case series of Gallstone Ileus that occurred in our hospital, as well as the diagnostic procedures, treatments and follow-up of these patients.

CASE SERIES

Six patients with obstruction induced by gallstone were included in this case series. All patients were females with a median age was 82 (76–90) years. Patients were admitted to the emergency department with the symptoms of gastrointestinal obstruction such as abdominal pain, vomiting, abdominal distension and constipation.

On admission, none had undergone previous biliary surgery, and only three cases (50%) had a known history of cholecystitis eight months after surgery. The gallstone was manipulated in a retrograde manner into the distended proximal visera and removed through a longitudinal enterotomy (Figure 3) or gastrotomy as previously pointed. The remaining small bowel was explored for other gallstones. When detected, they were also removed (which happened in one case). The incision was closed transversely using a single-layer suture to repair (Figure 4).

During the postoperative period, complications related to the procedure were recorded in four subjects. There was one (16.6%) perioperative mortality, due to cerebrovascular accident (details in Table 1).

Further biliary symptoms were observed in only one case (16.6%), with a patient presenting a case of cholecystitis eight months after surgery.

DISCUSSION

Gallstone ileus is an uncommon complication of gallstone disease. It is however, the most common cause of non-strangulating mechanical small bowel obstruction accounting for 1–4% of the cases [6]. As the western population continues to age, this condition will assume an increasing significance and impact, so the knowledge and revision of procedures taken, and the follow-up of the cases, that appear in our Hospital Unit is a much needed and important reflection to make, so that in the future we can perfect and enrich the service performance in this life-threatening condition [5].

As the diagnosis may be difficult additional information is required, therefore the use of plain abdominal X-ray and abdominal CT scan is a much-needed source of information.

![Figure 1: (A) Axial plane of CT scan. The blue arrow shows the existence of a grossly triangular radiopaque structure in the distal portion of the jejunum, approximately 2 cm in diameter, from which an extensive collapse of the distal jejunal loops and especially of the ileum can be seen, with a marked upward gastrointestinal distension pointed by the green arrow. (B) Sagittal plane of CT scan. A moderate pneumobilia is observed, pointed by the yellow arrow. (C) Coronal plane of CT scan. The yellow arrow points the existence of pneumobilia associated with an irregularity of the lateral aspect of the first portion of the duodenum, where non-specific linear radiopaque structures were observed. Green arrow points the gastrointestinal distention proximal to the local of obstruction.](image-url)
Table 1: Details of the patients’ features, operative findings, surgical procedure and postoperative complications.

<table>
<thead>
<tr>
<th>Nº</th>
<th>Gender</th>
<th>Age</th>
<th>History of cholelithiasis</th>
<th>Rigler’s triade</th>
<th>Location of the stone</th>
<th>Surgical treatment</th>
<th>Postoperative complications</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>79</td>
<td>Yes</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Ileum</td>
<td>Enterolithotomy</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>76</td>
<td>Yes</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Ileum</td>
<td>Enterolithotomy + Fistula closure + colecistectomy</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>90</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Ileum</td>
<td>Enterolithotomy</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>87</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Duodenum</td>
<td>Gastrolitotomy</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>82</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Jejunum</td>
<td>Enterolithotomy</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>80</td>
<td>Yes</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Jejunum</td>
<td>Enterolithotomy</td>
</tr>
</tbody>
</table>
Plain abdominal radiographs are of major importance in establishing the diagnosis. In 1941 Rigler et al described the signs found in gallstone ileus: partial or complete intestinal obstruction, pneumobilia and an aberrant gallstone [7]. The presence of two of the three first signs is considered pathognomonic. In later years, other signs have been added by different authors, however plain abdominal radiographs lack in specificity and sensibility for this condition [4].

Abdominal ultrasound is a complementary examination to the plain abdominal radiograph and is more sensitive at detecting pneumobilia and ectopic gallstones. The combination of abdominal ultrasound and plain abdominal radiograph increases the sensitivity by 74% [8].

CT scan presents with a sensitivity of up to 93% in the detection of gallstone ileus cases [9]. In our series, the ectopic gallstone was observed in all the patients and a complete Rigler’s triad in 83.3%.

The frequency of Rigler’s triad detection is nowadays much superior, as for identifying a mechanical intestinal obstruction, small amount of air in the gallbladder and gallstone. As the CT scan can describe the location of the fistula, gallstones and obstruction with a higher precision, it allows better therapeutic decisions, assuming the position of the gold standard in the diagnosis, when a high index of suspicion is present [9].

When it comes to treatment there is no consensus. The main goal is to extract the offending gallstone. However, as most patients are elderly, and usually present several comorbidities, these reflect an increase in risk with surgery time, mortality and morbidity. The current surgical procedures in use are: simple enterolithotomy; enterolithotomy cholecystectomy and fistula closure (one step procedure); and enterolithotomy with cholecystectomy performed in a two-step procedure [10].

Enterolithotomy is the most commonly surgical procedure performed. The main source of confusion comes from whether biliary surgery should be carried out at the same time as the relief of obstruction, performed latter, or not performed at all [11].

Enterolithotomy has been shown to be associated with lower morbidity and mortality, lower operative time and a shorter hospital stay. Reisner et al showed a mortality rate of 12% for simple enterolithotomy comparing with 17% for the one step procedure [6]. In our series, the only perioperative mortality occurred in the patient submitted to one step procedure, however in this case, patient died of cardiovascular complications, not directly associated to the surgical procedure.

Up to 50% of biliary enteric fistula closed spontaneously and biliary symptoms requiring surgery were seen in 10% of patients [6]. The report of recurrent gallstone ileus may be underestimated because figures are mainly based on case reports or small series [3].

A laparoscopic approach is still limited in experience with this condition, however in selected cases may help to reduce morbidity and mortality, with improvement in postoperative recovery [12].

CONCLUSION

Gallstone ileus is a rare entity, difficult to diagnose and requires a high index of suspicion. Abdominal CT scan is the diagnostic modality of choice due it’s high sensitivity. Since the majority of these patients are elderly, usually with multiple co-morbidities, the surgical treatment of choice should be as aggressive as possible and able to relieve the obstruction. In this sense, a
simple enterolithotomy alone is the procedure of choice in the emergency context. The one-stage procedure with enterotomy plus cholecystectomy should be reserved for patients presenting in good general condition with a low degree of cholecystitis.

REFERENCES


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