

## Review

## A systematic review of gallstone sigmoid ileus management

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## ABSTRACT

**Introduction:** Gallstone sigmoid ileus is a rare although serious complication of cholelithiasis resulting in large bowel obstruction. The condition accounts for 4% of all gallstone ileus patients. There are no recognized management guidelines currently. Management strategies range from minimally invasive endoscopy and lithotripsy to substantial surgery. We aim to identify trends when managing patients with gallstone sigmoid ileus to help improve outcomes.

**Methods:** Literature searches of EMBASE, Medline and by hand were conducted. All English language papers published from 2000 to 2017(Oct) were included. The terms 'gallstone', 'sigmoid', 'colon', 'ileus', 'coelus' and 'large bowel obstruction' were used.

**Results:** 38 papers included, male:female ratio was 8:30. Average age was 81.11 (SD ± 7.59). Average length of preceding symptoms was 5.31days (+/-SD3.16). 20/38 (59%) had diverticulosis. 89% of patients had significant comorbidities documented. 34/38 patients underwent computerized tomography. 31 stones were located within sigmoid colon, 4 at rectosigmoid junction and 2 within descending colon. Average impacted gallstone size was 4.14 cm (2.3–7 cm range). 23/38 (61%) patients' initial management was conservative or with endoscopy ± lithotripsy. Conservative management successfully treated 26% of patients. 28/38 (74%) patients ultimately underwent surgical intervention. 5/38 patients died post-operatively. Patients treated non-operatively had shorter hospital stays (4:12.3days) although not significant (p-value = 0.0056).

**Conclusions:** There is no management consensus from the literature. Current evidence highlights endoscopy and lithotripsy as practical firstline strategies. However, surgical intervention should not be delayed if non-operative measures fail or in emergency. Given the complexity of such patients, less invasive timesaving surgery appears practical, avoiding bowel resection and associated complications.

## 1. Introduction

Sigmoid gallstone ileus is a rare complication of cholelithiasis leading to large bowel obstruction. Gallstone ileus, in general, arises in 0.3–0.5% of patients with cholelithiasis [1] and accounts for between 1 and 4% of patients with intestinal obstruction [2,3]. Many clinicians will have encountered patients with gallstone ileus resulting in small bowel obstruction. The condition most often affects elderly women with multiple co-morbidities. Gallstone ileus generally occurs as a result of a cholecystoenteric fistula between the gallbladder and small bowel, with most enteric fistulae occurring between the duodenum and gallbladder [4]. The commonest sites for stone impaction are the distal ileum and ileo-caecal valve, which together account for 60–85% of cases [3].

In contrast, sigmoid gallstone ileus arises as a result of either a cholecystocolonic fistula between the gallbladder and large bowel or a

stone traversing the ileocolic junction. If the gallstone is unable to pass distally, large bowel obstruction ensues. Gallstone sigmoid ileus accounts for 4% of all gallstone ileus patients [3]. This equates to between 12 and 15 patients per 100,000 of all patients with gallstone disease [1,3]. The same cohorts of patients are affected as those with gallstone ileus. Colonic pathology with the potential for luminal stricturing such as diverticular disease may increase the likelihood of a stone becoming impacted [5].

In general, gallbladder fistulae are uncommon. Such findings are identified in 0.9% of biliary tract surgery. Cholecystoduodenal fistulae account for 70% of these while cholecystocolic fistulae make up 10–20% and cholecystogastric fistulae account for the remainder [6].

At present, in view of its uncommon nature, there are no unified management guidelines to treat sigmoid gallstone ileus. Management strategies are individualized to the patient and managing team and can

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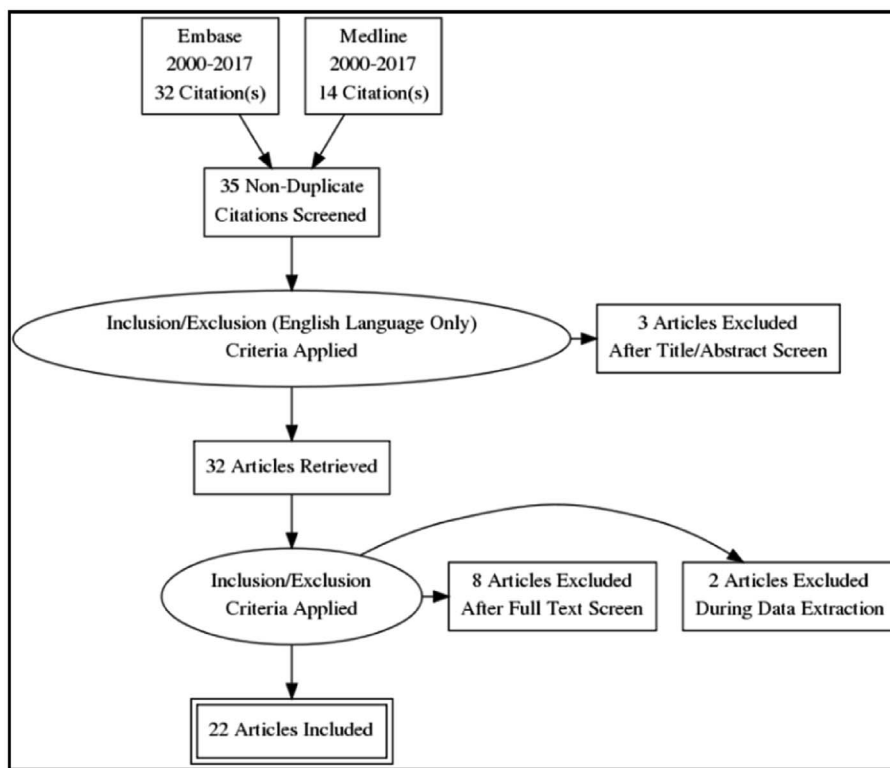


Fig. 1. Database literature search - PRISMA diagram.

range from minimally invasive endoscopy and lithotripsy to a variety of surgical procedures including significant bowel resection or stoma formation. As a result, patient outcomes vary significantly.

Following the successful treatment of an 89 year old female patient with a novel surgical approach after failed trial with endoscopy at our center [7] and two subsequent cases [8] we felt it of benefit to other clinicians and patients to conduct an up-to-date literature review. The aim of this paper is to identify potential trends when managing such patients to help improve patient outcomes.

## 2. Methods

A literature search of both EMBASE and Medline was conducted. All papers published in English from year January 2000–September 2017 were included to elucidate current practice. The terms ‘gallstone ileus,’ ‘sigmoid,’ ‘colon’ and ‘colecus’ were used. The results are demonstrated in Fig. 1. Hand searches of PubMed and Google Scholar were also included. The work was registered with the research registry (researchregistry3126) and reported in line with PRISMA guidelines [9].

The literature search generated:

The database search yielded 23 results, whilst hand searches revealed 15 additional papers. Thus, a total of 38 papers were included within our literature review (Table 1). All the papers generated from the search were case reports, 2 of which came from a case series (See Table 2). The cases reviewed were all published in English between the years 2000–2017. The reports originated from a range of countries including the UK, USA, Turkey, Greece, Belgium and Italy.

Different aspects relating to management were analysed, these

included; patient age, patient sex, journal, publication date, stone size, length of symptoms, presenting complaint, was computerized tomography undertaken, first line management, subsequent management, emergency/perforation, comorbidities, length of stay and complications. T-test was used to look for any statistical significance between the male and female cohorts where applicable.

Two authors independently reviewed the cases and fed the data into a spreadsheet. If discrepancies arose a 3rd author was utilised to determine the outcome used. Given that the data related to case reports there were no assumptions or simplifications that were required. Where data was not stated it was not included in our review. Reporter bias was considered, however given that the study relates to individual cases this was deemed an inevitable limitation.

## 3. Results

Patient demographics are presented in Table 3. There were nearly three times more female than male patients reported in the literature. Ages ranged from 65 to 94 years, with a mean age of 81.1 years. Duration of symptoms varied from less than a day to a fortnight. The average length of symptoms prior to presentation was 5.31 days and was not significantly different (*p*-value 0.81) between men and women.

All patients reported were found to have gallstones, with five having had recent episodes of cholecystitis or gallbladder empyema in the preceding months. Diverticulosis was the most commonly found comorbidity, seen in 59% of patients (where co-morbidities were reported). Other comorbidities within this cohort included cardiovascular disease (47%) and cancer (11%). One patient was found to have cholangiocarcinoma with liver metastases during their presentation [10]. Another had previously treated endometrial and breast cancer [11]. A third had endometrial cancer and inoperable oesophageal cancer [12] and another had treated uterine cancer [13]. Other co-morbid conditions are listed in Table 4.

Patients presented in a variety of manners as documented in Table 5. 74% of patients presented with symptoms of abdominal pain,

Table 1

Search results.

Database Searches	23
Hand Searches	15
<b>Total</b>	<b>38</b>

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