Introduction

Gallstone ileus is a rare and potentially life-threatening manifestation of cholelithiasis. The gallstone enters the enteric lumen through a biliary-enteric fistula and impaction of the stone causes ileus. According to the literature, this condition mainly occurs in older women, and its treatment is accompanied by a significant amount of morbidity and mortality.

Surgical intervention has been considered the mainstay of treatment, although the addition of cholecystectomy to the emergency enterolithotomy (removal of the stone after enterotomy) at the initial operation is controversial. Alternatively, conservative therapy can be chosen because spontaneous resolution of gallstone ileus or successful endoscopic treatment has been increasingly reported. If conservative treatment is highly effective, it would be attractive, since older patients often have severe comorbid disease which compromises the postoperative course. However, the exact prediction of spontaneous evacuation of gallstones remains difficult.

In this case report, we describe a patient with gallstone ileus. Although conservative treatment was attempted, enterolithotomy was eventually performed due to delayed evacuation of the stone.

Case presentation

A 61-year-old woman was referred to our hospital for three days of appetite loss and intermittent vomiting. She was on medication for psychiatric symptoms for several years. Her blood test revealed elevated levels of serum creatine phosphokinase (3066 U/L; normal range, 43-165 U/L), white blood cells (10.2 × 10^3/μL; normal range, 41-93 × 10^3/μL), C-reactive protein (26.6 mg/dL; normal range, 0-0.3 mg/dL), and serum creatinine (10.64 mg/dL; normal range, 0.047-0.79 mg/dL).

Abdominal computed tomography (CT) scans revealed a distended upper gastrointestinal tract, pneumobilia, and impaction with an oval mass measuring 3.2 × 2.5 cm in size within the intestinal lumen, leading to a diagnosis of gallstone ileus. The patient was initially treated conservatively with volume resuscitation, continuous hemodialysis for acute renal failure, and an ileus tube. Although the patient’s condition improved, evacuation of the stone was not observed 5 days after admission. The patient then underwent enterolithotomy and the initial diagnosis was confirmed surgically. The postoperative course was uneventful and follow-up endoscopy revealed spontaneous closure of the biliary-enteric fistula.

Conclusion

Spontaneous resolution of gallstone ileus after conservative treatment has been increasingly reported. However, our experience suggests that swift transition to surgical intervention is necessary when conservative treatment is not effective. Although spontaneous closure of the fistula may occur early after enterolithotomy, long term result, including cancer development, remains unknown.

Keywords: gallstone ileus, spontaneous closure, biliary-enteric fistula

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and transverse diameters of the mass were 32 mm and 25 mm, respectively. CT scans also revealed pneumobilia and a fistula between the gallbladder and the duodenum (Fig. 1B), which was confirmed by upper gastrointestinal endoscopy examination (Fig. 1C). The patient was diagnosed with gallstone ileus, dehydration due to ileus, consequent acute prerenal renal failure, and severe intestinal infection. The patient was initially treated conservatively with an ileus tube, hydration via intravenous infusion, antibiotic therapy, and continuous hemodialysis in the intensive care unit.

After 5 days of intensive treatment, the patient’s general condition improved dramatically. However, repeat CT scans revealed that the gallstone remained within the jejunum, although the stone had moved slightly to the anal side of its original position. The patient underwent an exploratory laparotomy with a midline incision and the small intestine at the obstruction was exteriorized. An enterolithotomy was performed with a vertical incision, and closed with transverse sutures of the small intestine.

The operation time was 53 min, and there was minimal blood loss. The postoperative course was uneventful and follow-up endoscopy 10 days after the operation revealed that the fistula had spontaneously closed (Fig. 1D). The patient was discharged 19 days after the operation, under close observation for the recurrence of cholelithiasis.

**Discussion**

Gallstone ileus is a rare condition, which predominantly affects older women. A study stated that only 0.095% of cases of mechanical bowel obstruction are caused by gallstone ileus in the United States\(^1\), which is much lower than previously reported\(^2,3\). This decline in the frequency of gallstone ileus may be due to the increased number of laparoscopic cholecystectomies that are now performed\(^4\). Another possible explanation is that conservative treatment may be chosen more frequently than before. Indeed, recent reports suggest the majority of cases now undergo spontaneous stone evacuation or
endoscopic treatment. The precise diagnosis of gallstone ileus using modern diagnostic radiology might have accelerated this trend. Besides, conservative management to avoid surgery is preferred, especially in older patients who often have severe comorbidities.

In our patient, gallstone ileus was accompanied by severe dehydration, acute renal failure, and enteritis. As such, surgical treatment was considered too invasive, leading to the initiation of conservative treatment with an ileus tube, volume resuscitation and continuous renal replacement therapy. However, repeat CT scans revealed the gallstone remaining in the jejunum, and so enterolithotomy was performed instead of continuing conservative treatment. Thus this case presents two important clinical lessons: first, occasionally spontaneous evacuation of larger stones doesn’t occur although it is an attractive management strategy; and second, prompt transition to surgical intervention should be considered in similar cases.

The rate of spontaneous resolution of gallstone ileus by conservative treatment is unclear. A review of reported cases suggested that the spontaneous evacuation of gallstones only occurs in around 1% of cases. Another review of recurrent gallstone ileus demonstrated a 4.9% success rate for conservative treatment at the first episode of gallstone ileus, while reports suggest 7%-14% of reported episodes of gallstone ileus in Japan are treated without surgery. Gallstones less than 2 cm in size are more likely to be successfully treated conservatively. However, a review of recently reported cases showed spontaneous evacuation of larger stones (diameter greater than 2.5 cm). Estimating the rate of spontaneous evacuation is generally compromised by a number of biases, discrepancies and differences among reports. Thus, predicting the results of conservative treatment in each patient is still difficult, and treatment could vary significantly among institutes and/or countries. Therefore, a systematic survey of the efficacy of conservative therapy is necessary to decide whether a patient should promptly undergo surgical intervention after resuscitation, or first attempt conservative treatment.

The spontaneous closure of a biliary-enteric fistula early after enterolithotomy has been rarely reported. Theoretically, a biliary-enteric fistula may be associated with retrograde cholangitis or the development of malignancy as a result of chronic inflammation. Spontaneous closure of the fistula means that a delayed elective cholecystectomy can be avoided, however, closure of the fistula may result in the future development of another gallstone and/or recurrent gallstone ileus. The long-term consequences of spontaneous fistula closure remain unclear, and thus we decided that close observation of the biliary tract was mandatory in our patient. The accumulation of similar reports in the literature will be necessary to fully understand this condition.

In conclusion, predicting the spontaneous resolution of gallstone ileus remains difficult. When conservative therapy is chosen, repetitive evaluation of the impacted stone is essential in order to shorten the hospital stay and precisely time any surgical intervention that may be required. After enterolithotomy, spontaneous closure of the biliary-enteric fistula can be observed with endoscopic examination. However, more experience is necessary to understand the long-term consequences of spontaneous closure, including cancer development.

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Reference