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Case Report

Meckel's diverticulum complicating gallstone ileus-a surgical odyssey: case report and literature review

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ABSTRACT

Meckel's diverticulum is a common anomaly of the gastrointestinal tract, often presenting with various complications. Here, we present a case of a 50-year-old female with a history of hysterectomy and cesarean sections, who presented with symptoms consistent with gallstone ileus. Upon investigation, a Meckel's diverticulum with an associated cholecystoduodenal fistula was identified. Surgical intervention involved resection of the affected intestinal segment and anastomosis, without additional intervention targeting the gallbladder or fistula repair. A systematic review revealed four reported cases of Meckel's diverticulum complicating gallstone ileus in the literature. Our case underscores the importance of considering Meckel's diverticulum in the differential diagnosis of gallstone ileus and highlights the efficacy of a tailored surgical approach.

Keywords: Meckels diverticulum, Biliary complications, Intestinal obstruction, Gastrointestinal surgery, Bilioenteric fistula, Intestinal anastomosis, Mirizzi syndrome

INTRODUCTION

Meckel's diverticulum stands out as the most common anomaly of the gastrointestinal tract.[1] It arises from the anti-mesenteric surface of the mid to distal ileum due to incomplete obliteration of the omphalomesenteric duct. This diverticulum may contain ectopic tissue in a wide range, approximately 4.6% to 71%, increasing its risk of complications. With an incidence of 2% in the general population, it typically manifests before the age of two, with a higher prevalence in males. It is typically located an average of 60 cm from the ileocecal valve.[2]

Gallstone ileus, on the other hand, accounts for approximately 4% of cases of intestinal obstruction.[3,4] Its incidence increases in individuals over 65 years of age and is often the result of a fistula between the gallbladder and the gastrointestinal tract, triggered by the impaction of a calculus. In most cases, this impaction occurs in the duodenum, being the most common site, followed by the distal ileum, although less frequently observed in the jejunum.[5,6]

Mirizzi's syndrome, another entity related to biliary pathology, is a rare condition that occurs mostly in women aged 50 to 70 years.[7] This condition is characterized by impaction in the infundibulum of the gallbladder, leading to chronic inflammation and, in some cases, the formation of a cholecystobiliary fistula.[8]

This review will focus on exploring the relationship between Meckel's diverticulum and gallstone ileus, as

well as discussing the diagnostic challenges and therapeutic strategies for addressing this uncommon but clinically relevant combination of gastrointestinal pathologies.

CASE REPORT

A 50-year-old female patient with a medical history significant for hysterectomy due to HPV and two previous cesarean sections presented to the emergency department with complaints of abdominal pain, nausea, vomiting, and absence of bowel movements for one week, despite treatment with antispasmodics. Upon admission, she exhibited intractable fecaloid vomiting, prompting the placement of a nasogastric tube, which drained 2350 cc of gastric contents within the first 24 hours. Laboratory investigations at admission revealed normal liver function tests and electrolyte levels, alongside elevated creatinine at 1.56 mg/dL and urea at 76.9 mEq/L.

Figure 1: Meckel's diverticulum intact with gallstone inside.

Abdominal ultrasonography (USG) demonstrated normal intrahepatic and extrahepatic bile ducts, with a porta hepatis and common bile duct measuring 9 mm and 5 mm in diameter, respectively. The gallbladder measured 25×17 mm with a 3 mm thick wall, and an echogenic image of 6 mm was noted within its lumen. No evidence of biliary duct dilation or perivesicular edema was observed, prompting consideration of an ileus.

Surgical intervention was performed 48 hours after admission. Initially attempted laparoscopically, the procedure was converted to an open approach due to findings of intestinal distension and a non-calculous gallbladder. Intraoperatively, a Meckel's diverticulum was identified 65 cm from the ileocecal valve, containing a gallstone and associated with a cholecystoduodenal fistula. An 8 cm segment of the small intestine was resected, and a hand-sewn end-to-end entero-enteric anastomosis using 3-0 silk was performed (Figure 1). No surgical management of the gallbladder or fistula repair was undertaken. The postoperative course was uneventful, and the patient was discharged 72 hours after the procedure.

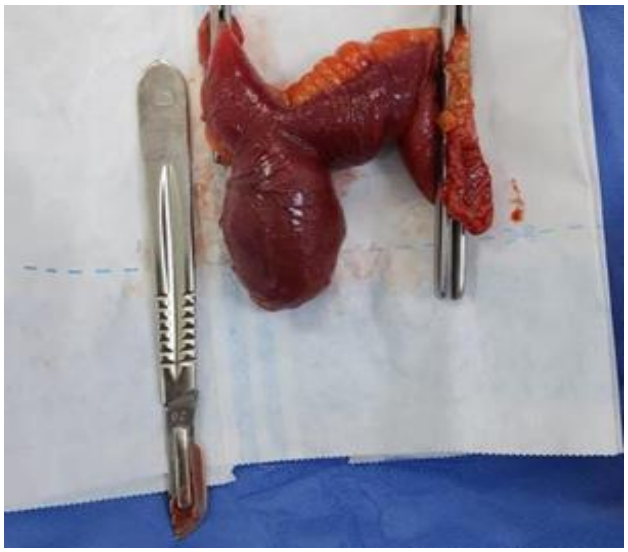

Figure 2: Surgically resected Meckel's diverticulum with gallstone.

Pathological examination revealed a segment of small intestine measuring 14×1.5 cm, containing a 4×2 cm gallstone, along with mild chronic ileitis and a Meckel's diverticulum composed of intestinal tissue containing a vesicular gallstone.

Figure 3: Macroscopic review of Meckel's diverticulum.

DISCUSSION

A systematic review of documented cases of Meckel's diverticulum with gallstone ileus yielded only four reported cases in the literatura.[7,9] Gallstone ileus presents with a clinical picture characterized by intestinal obstruction, intermittent abdominal pain, diverticulitis, bleeding, and intestinal perforation. Management strategies for Meckel's diverticulum containing a gallstone typically include one of the following approaches: single-stage surgery involving enterolithotomy, cholecystectomy, and fistula repair; two-stage surgery comprising enterolithotomy followed by delayed cholecystectomy and fistula closure; or diverticulum resection to prevent complications.[1] Alternatively, in the majority of cases, a single-stage enterolithotomy without concomitant cholecystectomy or fistula repair is performed, as most fistulas tend to close spontaneously following resolution of the obstruction.

In the presented case, a female patient with a history of hysterectomy and cesarean sections presented with symptoms consistent with gallstone ileus, ultimately attributed to a Meckel's diverticulum with an associated cholecystoduodenal fistula. The surgical approach involved resection of the affected intestinal segment and anastomosis, with no additional intervention targeting the gallbladder or fistula repair. This management strategy proved effective, as evidenced by the patient's favorable postoperative course and timely discharge.

These findings underscore the importance of considering Meckel's diverticulum as a potential etiology in cases of gallstone ileus, particularly in patients with a history of abdominal surgery. Furthermore, they highlight the need for individualized treatment approaches based on the specific characteristics of each case, including the location of the diverticulum, the presence of associated complications such as fistulas, and patient's overall clinical status.

CONCLUSION

A systematic review of documented cases revealed only four instances of Meckel's diverticulum concomitant with gallstone ileus reported in the medical literatura. In the presented case, diagnosis was achieved through exploratory laparotomy, followed by intestinal resection and termino-terminal entero-entero anastomosis. Notably, no surgical intervention was performed for the associated biliary fistula. The patient's postoperative course was marked by a favorable evolution, indicating the efficacy of this management approach.

These findings emphasize the rarity of Meckel's diverticulum complicating gallstone ileus and underscore the importance of considering this condition in the differential diagnosis of patients presenting with signs and symptoms suggestive of intestinal obstruction. Furthermore, the successful outcome observed in the presented case highlights the effectiveness of the selected surgical approach, which prioritized intestinal resection over additional interventions targeting the biliary fistula.

However, further research and documentation of similar cases are warranted to better understand the optimal management strategies for this rare clinical entity and to refine treatment guidelines accordingly. Such efforts will contribute to improving patient outcomes and guiding clinicians in their decision-making process when encountering similar presentations in clinical practice.

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