

Cholecystoduodenal Fistula Leading to Bouveret Syndrome: A Case Report

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ABSTRACT

Bouveret syndrome is a rare cause of proximal gastrointestinal tract obstruction caused by the impaction of a gallstone migrating through a bilioenteric fistula, with the cholecystoduodenal fistula being the most common route. We present the case of a 76-year-old female patient with a history of chronic cholelithiasis who consulted due to nausea, persistent vomiting, epigastric pain, and early satiety. Imaging studies, including computed tomography (CT) and upper gastrointestinal endoscopy, revealed a large gallstone impacted in the second portion of the duodenum and a cholecystoduodenal fistula. Due to the size of the stone and failure of endoscopic extraction, surgical management was chosen, consisting of cholecystectomy, fistula closure, and stone removal, with favorable postoperative evolution. This case highlights the importance of early diagnosis and individualized management in Bouveret syndrome associated with cholecystoduodenal fistula to improve the prognosis of this rare but potentially serious condition.

KEYWORDS: Bouveret syndrome, cholecystoduodenal fistula, gastric obstruction, impacted gallstone, complicated cholelithiasis, proximal intestinal obstruction, surgical treatment, upper gastrointestinal endoscopy.

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INTRODUCTION

Bouveret syndrome is a rare and particular form of proximal intestinal obstruction, specifically pyloric or duodenal obstruction, caused by the impaction of a large gallstone in the upper gastrointestinal tract. This phenomenon is an uncommon complication of chronic cholelithiasis, usually occurring in elderly patients with a prolonged history of biliary disease. The pathophysiology involves the formation of a bilioenteric fistula, with the cholecystoduodenal fistula being the most frequent variant, through which gallstones migrate from the gallbladder into the small intestine.^{1,2}

The presence of this abnormal communication between the gallbladder and the duodenum facilitates the entry of large gallstones, which cannot be spontaneously eliminated and eventually obstruct the intestinal lumen, causing obstructive symptoms characterized mainly by nausea, persistent vomiting, abdominal pain, and early satiety. Due to the insidious and often nonspecific nature of these symptoms, diagnosis may be delayed, increasing the risk of serious complications such as dehydration, intestinal perforation, or infection.³

The clinical diagnosis of Bouveret syndrome relies on imaging tools such as abdominal X-rays, computed

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tomography (CT), and upper gastrointestinal endoscopy. CT is often the method of choice due to its high sensitivity in identifying the fistula, impacted stone, and signs of obstruction, while endoscopy sometimes confirms the presence of the stone and may allow therapeutic extraction.⁴ Management of this condition varies from minimally invasive endoscopic interventions to open or laparoscopic surgery, depending on stone size, the patient's clinical condition, and the presence of complications. Since affected patients are often high surgical risk, decision-making must be careful and personalized.⁵

In this report, we describe a clinical case of cholecystoduodenal fistula associated with Bouveret syndrome to illustrate the clinical presentation, diagnostic findings, and therapeutic options, emphasizing the importance of a multidisciplinary approach for successful management of this rare but potentially serious condition.⁶

CASE PRESENTATION:

A 76-year-old female patient with a medical history of chronic cholelithiasis diagnosed over a decade ago, controlled hypertension treated with enalapril, and type 2 diabetes mellitus treated with metformin. The patient reported intermittent episodes of right upper quadrant abdominal pain over recent years, managed outpatient without surgical follow-up.

She presented to the emergency department with a 7-day clinical course of persistent nausea and recurrent vomiting of food contents, increasing in frequency and intensity, accompanied by diffuse abdominal pain predominantly in the epigastrium, colicky in nature, with episodes of early satiety and progressive abdominal distension. She denied fever, jaundice, or changes in bowel habits.

Physical examination showed hemodynamic stability: blood pressure 130/80 mmHg, heart rate 90 bpm, respiratory rate 18 breaths/min, and temperature 36.8°C. The abdomen was distended with deep tenderness in the epigastrium, without signs of peritoneal irritation or palpable masses. The rest of the physical exam was unremarkable.

Laboratory studies revealed mild leukocytosis (12,000 leukocytes/mm³) with neutrophilia, moderate elevation of alkaline phosphatase (150 U/L), and normal bilirubin and liver transaminases. Plain abdominal X-ray showed significant gastric chamber dilation and air-fluid levels compatible with upper gastrointestinal tract obstruction.

Given clinical suspicion, contrast-enhanced abdominal CT was performed, demonstrating gastric and duodenal bulb dilation, with visualization of a 3 cm diameter gallstone impacted in the second portion of the duodenum. Additionally, an abnormal communication between the gallbladder and duodenum consistent with a cholecystoduodenal fistula was identified, with biliary air and gallbladder wall thickening.



Figure 1: Computed tomography showing a 3 cm diameter gallstone impacted in the second portion of the duodenum.

Upper gastrointestinal endoscopy confirmed the presence of the impacted gallstone obstructing the duodenal lumen and visualized the fistulous opening on the adjacent duodenal

mucosa. Endoscopic extraction attempts were unsuccessful due to the stone's size and position.



Figure 2: Endoscopy showing a fistulous opening in the adjacent duodenal mucosa.

Given the confirmed diagnosis of Bouveret syndrome secondary to a cholecystoduodenal fistula and failure of endoscopic management, elective surgical intervention was performed. Cholecystectomy, resection and closure of the

cholecystoduodenal fistula, and removal of the impacted gallstone by duodenotomy were carried out without intraoperative complications.



Figure 3: Extraction of the impacted gallstone through duodenotomy.

In the immediate postoperative period, the patient showed good clinical progress, resolution of obstructive symptoms, and gradual recovery of digestive function. She was discharged on the seventh postoperative day with scheduled outpatient follow-up, without short-term complications.

DISCUSSION

Bouveret syndrome is a rare variant of intestinal obstruction caused by an impacted gallstone in the proximal gastrointestinal tract, generally in the duodenum or pylorus. This entity is an uncommon but serious complication of chronic cholelithiasis, representing approximately 1-3% of all gallstone-related intestinal obstructions. The defining characteristic is gastric outlet obstruction caused by a gallstone migrated through a bilioenteric fistula.^{7,8} The formation of a cholecystoduodenal fistula, as in the presented case, results from chronic inflammation and adhesions between the gallbladder and duodenum, eventually

eroding the walls of both organs. This process creates an abnormal communication allowing large gallstones to migrate directly into the intestinal lumen, bypassing the physiological biliary route. The cholecystoduodenal fistula is the most common bilioenteric fistula, followed by cholecystocolonic and cholecystogastric fistulas.⁹

Impaction of a gallstone in the duodenum or pylorus generates mechanical obstruction manifested clinically by typical symptoms of gastric outlet obstruction, such as nausea, persistent vomiting, abdominal pain, and early satiety. Since these symptoms may be confused with other gastrointestinal pathologies, diagnosis is often delayed, complicating management.¹⁰

Timely diagnosis requires a high index of clinical suspicion and appropriate use of imaging techniques. CT is particularly useful to identify Rigler's triad — intestinal obstruction, pneumobilia (air in the biliary tract), and ectopic gallstone — and allows direct visualization of the cholecystoduodenal

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fistula and exact stone location. Upper endoscopy confirms the obstruction and may occasionally permit endoscopic stone removal, though this approach is limited by stone size and location.¹¹

Therapeutic management of Bouveret syndrome is challenging and should be individualized. Options include endoscopic techniques, with stone extraction or fragmentation, and surgery, typically involving cholecystectomy, fistula closure, and stone removal. Treatment choice depends on patient clinical condition, stone size, and medical team expertise.^{11,12}

In summary, the cholecystoduodenal fistula plays a fundamental role in Bouveret syndrome pathogenesis by permitting gallstone migration to the proximal gastrointestinal tract where significant obstruction can occur. Early diagnosis and appropriate management are essential to prevent severe complications and improve patient prognosis.¹²

CONCLUSION

Although rare, Bouveret syndrome represents an important cause of mechanical gastric outlet obstruction secondary to gallstone impaction in the proximal gastrointestinal tract. The cholecystoduodenal fistula is the primary pathological route enabling stone migration from the gallbladder to the duodenum and is key in the pathophysiology of this entity.^{12,13}

Early recognition is crucial, as the clinical presentation may be nonspecific and differential diagnoses broad. Imaging techniques, especially computed tomography and upper gastrointestinal endoscopy, play a crucial role in identifying the impacted stone and fistula, facilitating timely therapeutic intervention.¹³

Management requires a multidisciplinary approach considering patient clinical features and available treatment options, ranging from endoscopic procedures to surgery. Appropriate diagnosis and treatment can significantly improve prognosis and reduce associated morbidity.¹³

This case report emphasizes the importance of suspecting Bouveret syndrome in patients with a history of cholelithiasis presenting with gastric obstructive symptoms to ensure effective and timely treatment.

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