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Post-Cholecystectomy Mirizzi Syndrome Due to Retained Cystic Duct Stones: A Case Report

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ABSTRACT

Mirizzi syndrome is a rare complication of gallstone disease caused by extrinsic compression of the common hepatic duct, resulting in biliary obstruction. We present a 27-year-old female with known cholelithiasis who developed persistent right upper quadrant pain, nausea, and vomiting. Initial imaging showed cholelithiasis without acute cholecystitis, and she underwent robotic-assisted cholecystectomy. Although initially improved, she re-presented weeks later with worsening abdominal pain and new-onset jaundice. Laboratory studies showed transaminitis and hyperbilirubinemia, with imaging revealing biliary ductal dilation. Magnetic resonance cholangiopancreatography confirmed retained cystic duct stones causing extrinsic bile duct compression, consistent with Mirizzi syndrome, emphasizing the need to evaluate postoperative biliary obstruction promptly.

***Keywords:** Mirizzi syndrome; cholecystectomy; cystic duct stones; biliary obstruction; MRCP; postoperative complication.*

Introduction

Cholelithiasis, the formation of gallstones within the gallbladder or bile ducts, remains a prevalent and clinically significant condition affecting millions worldwide [1]. It is a substantial burden on healthcare systems due to its associated complications, including biliary colic, cholecystitis, and even potentially life-threatening conditions like choledocholithiasis [1]. Laparoscopic cholecystectomy is a cornerstone of modern surgical care and the standard treatment for symptomatic gallbladder disease, including conditions such as cholelithiasis, acute and chronic cholecystitis, biliary dyskinesia, gallstone pancreatitis, and gallbladder polyps [2]. Since the early 1990s, this procedure has largely replaced open cholecystectomy due to its minimally invasive nature, offering patients less postoperative pain, shorter hospital stays, faster recovery, and lower complication rates [2]. Mirizzi syndrome is a rare condition caused by the obstruction of the common bile duct or common hepatic duct by external compression from multiple impacted gallstones or a single large impacted gallstone in Hartmann's pouch [3]. Presenting symptoms are similar to those of cholecystitis [3]. This condition may be confused with other obstructive conditions such as choledocholithiasis or ascending cholangitis due to the presence of jaundice [3]. Because preoperative diagnosis is frequently difficult, Mirizzi syndrome remains an important cause of unexpected biliary anatomy and operative complexity, with several classification systems developed to guide diagnosis and management [4,5]. Previous reviews emphasize the role of ultrasound, computed tomography, magnetic resonance cholangiopancreatography, and endoscopic retrograde cholangiopancreatography in distinguishing Mirizzi syndrome from other causes of obstructive jaundice [6]. Post-cholecystectomy Mirizzi syndrome is particularly uncommon and has been described in association with retained cystic duct remnant stones, residual gallbladder stump stones, or other postoperative biliary pathology causing extrinsic ductal compression [7]. Post-cholecystectomy Mirizzi syndrome remains especially relevant because retained cystic duct or gall-

bladder remnant stones can produce delayed biliary obstruction after an otherwise completed cholecystectomy, requiring prompt recognition and targeted endoscopic or surgical management [8].

This article presents an interesting case of a patient who was suffering from cholelithiasis and had undergone a cholecystectomy. Shortly thereafter, the patient had recurrent symptoms and was found to have an interesting case of post-cholecystectomy Mirizzi syndrome.

Case Presentation

A 27-year-old female with a history of recently diagnosed cholelithiasis presented to the emergency department with progressively worsening right upper quadrant abdominal pain. She reported that her gallstone disease had been identified several weeks to months prior to presentation; however, she had not yet undergone surgical intervention. Her symptoms began several days prior to admission and were characterized by constant, severe right upper quadrant pain radiating to the epigastric region. She noted that this episode differed from her prior intermittent postprandial biliary colic, which typically resolved within approximately 30 minutes. In contrast, the pain was persistent and progressively worsening. The pain was associated with significant nausea and multiple episodes of nonbloody, nonbilious emesis, resulting in an inability to tolerate oral intake for several days. She denied associated fever, chills, dysuria, hematuria, chest pain, or shortness of breath.

On initial evaluation, the patient was hemodynamically stable and afebrile, with normal oxygen saturation on room air. She appeared uncomfortable but was alert and oriented, without signs of acute distress. Physical examination revealed a soft, nondistended abdomen with focal tenderness to palpation in the right upper quadrant. There was no rebound tenderness or guarding, and no costovertebral angle tenderness was appreciated. Cardiopulmonary examination was unremarkable. Laboratory evaluation, including complete blood count, comprehensive metabolic panel, liver function tests, and lipase, was within normal limits, with no evidence of leukocytosis, hyperbilirubinemia, or transaminitis at the time of presentation. Imaging with right upper quadrant ultrasound demonstrated cholelithiasis without evidence of gallbladder wall thickening, pericholecystic fluid, or a sonographic Murphy sign, suggesting the absence of acute cholecystitis. Computed tomography of the abdomen and pelvis further confirmed a contracted gallbladder containing stones without evidence of acute intra-abdominal pathology or biliary ductal dilation.

Given the persistence and severity of her symptoms despite conservative measures, including analgesics and antiemetics, the patient required multiple administrations of intravenous opioids for pain control and was admitted for further management. General surgery was consulted, and due to her intractable symptoms and inability to tolerate oral intake, a decision was made to proceed with operative intervention. Within days of admission, the patient underwent a robotic-assisted cholecystectomy. Intraoperative findings were notable for a distended and inflamed gallbladder with a thickened, edematous wall and the presence of hydropic bile. The cystic duct was found to be dilated and inflamed, rendering it unsuitable for standard clip ligation; therefore, it was secured using suture ligation techniques. The procedure was otherwise completed without immediate intraoperative complications, and the gallbladder specimen contained multiple calculi.

In the immediate postoperative period, the patient initially demonstrated clinical improvement, with partial resolution of pain and gradual advancement of oral intake. However, approximately one to two weeks following surgery, she experienced a recurrence of abdominal pain, again localized to the right upper quadrant and epigastric regions. This was accompanied by worsening nausea, repeated episodes of vomiting, and a renewed inability to tolerate oral intake. Over the subsequent days, she developed new-onset jaundice and reported generalized malaise. On repeat evaluation, her vital signs remained stable; however, laboratory studies revealed significant abnormalities, including elevated transaminases, increased alkaline phosphatase, and marked hyperbilirubinemia, consistent with a cholestatic pattern of liver injury.

Further diagnostic imaging was obtained to evaluate for postoperative complications. Computed tomography of the abdomen and pelvis demonstrated intrahepatic and extrahepatic biliary ductal dilation without evidence of free intraperitoneal fluid or abscess formation. Ultrasound imaging of the gallbladder fossa identified a small cystic structure that was considered consistent with a postoperative hematoma, seroma, or remnant gallbladder tissue.

Given the concern for biliary obstruction, magnetic resonance cholangiopancreatography was subsequently performed. This revealed dilation of the cystic duct containing multiple retained calculi, with associated extrinsic compression of the extrahepatic bile duct and upstream dilation of the common hepatic and intrahepatic bile ducts. These findings were consistent with Mirizzi syndrome in the postoperative setting.

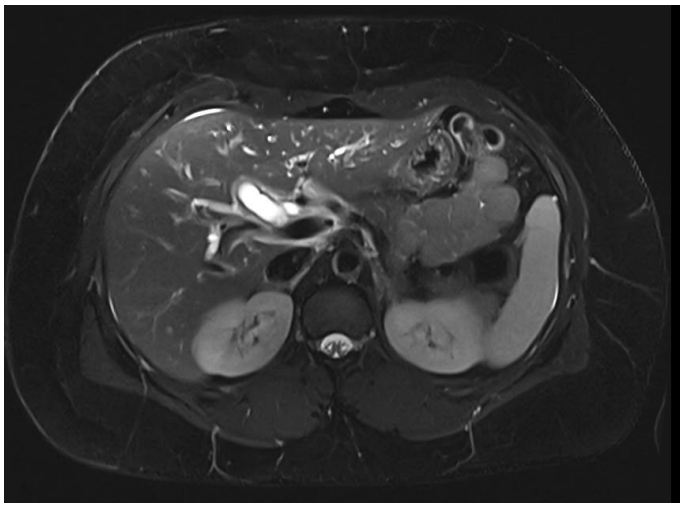

Figure 1. *depicts MRI of the abdomen with contrast during the patient's MRCP that showed dilation of the common hepatic and intrahepatic bile ducts.*

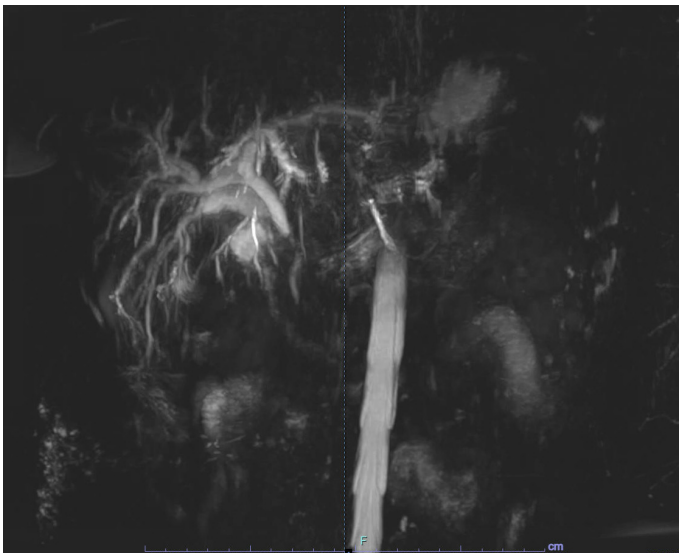

Figure 2. *depicts a coronal maximum intensity projection (MIP) showing dilation of the cystic duct and extrinsic compression of the extrahepatic bile duct.*

Following these findings, the patient was evaluated by both gastroenterology and surgical services for further management of her biliary obstruction. Given the complexity of her presentation, including recent cholecystectomy and evidence of retained stones causing extrinsic biliary compression, plans were made for advanced endoscopic and/or surgical intervention to relieve the obstruction and prevent further complications.

Discussion

The patient initially presented with the common complaint of right upper quadrant pain and was found to have cholelithiasis. She received the appropriate definitive treatment for symptomatic cholelithiasis, which was a cholecystectomy. Unfortunately, when her symptoms persisted, after an exhaustive work-up, it was found that she was having a rare case of post-cholecystectomy Mirizzi syndrome. It is important to note that she required an incredible amount of follow-up as an outpatient to arrive at this diagnosis. Had she had barriers to care such as language, insurance, or transportation, she might not have ever been diagnosed with this syndrome. Additionally, the cost of having outpatient follow-up visits with a gastroenterologist and an MRCP would have been substantial. Also, Mirizzi syndrome seemed to be an incredibly rare complication, as it did not exist as a potential differential in any of the providers' notes.

Conclusion

Post-cholecystectomy Mirizzi syndrome is a complicated condition that could leave patients needing extensive follow-up. Early detection and intervention are key to a patient's success. While we understand the underlying pathophysiology of the condition, we do not have strongly enforced screening guidelines or rapid treatment criteria for patients after a cholecystectomy. This calls for studies further investigating potential associations that the syndrome may have and alternative treatment strategies to account for potential comorbidities.

Statement of Informed Consent

Informed consent was obtained from the patient described in this case report.

Conflicts of Interest

The authors declare no conflict of interest and received no specific funding for this work.

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