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Case Report

Subtotal reconstructive laparoscopic cholecystectomy with rendezvous approach as treatment for cholecystocholedocholithiasis, Mirizzi syndrome type IV, and duodenal diverticulum

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ABSTRACT

This case report describes the successful management of complex biliary pathology in a 49-year-old female patient with Mirizzi syndrome type IV, cholecystocholedocholithiasis, and a duodenal diverticulum. A minimally invasive approach was employed, combining subtotal reconstructive laparoscopic cholecystectomy with a rendezvous procedure to facilitate stone clearance and biliary reconstruction. The case highlights the feasibility and safety of this combined technique in challenging scenarios, emphasizing the importance of individualized, multidisciplinary management. Further research is necessary to establish standardized protocols and evaluate long-term outcomes in similar complex cases.

Keywords: Adenocarcinoma, Colorectal, Carcinoma, Colonoscopy, Retrospective

INTRODUCTION

The rendezvous approach, as described in the literature, involves performing a laparoscopic cholecystectomy with simultaneous intraoperative endoscopic retrograde cholangiopancreatography (ERCP). During the procedure, a guidewire is passed through the cystic duct into the duodenum, facilitating selective cannulation of the common bile duct and endoscopic clearance of choledocholithiasis. This single-stage approach is supported by evidence for its feasibility, safety, and potential benefits, including reduced morbidity, shorter hospital stay, and lower risk of post-ERCP pancreatitis compared to the traditional two-stage approach (preoperative ERCP followed by laparoscopic cholecystectomy).[1-4] The rendezvous technique is particularly useful in cases of cholecystocholedocholithiasis, including acute presentations such as cholecystitis or biliary pancreatitis.[4] We present an interesting case of a subtotal reconstructive laparoscopic cholecystectomy with rendezvous approach as treatment for cholecystocholedocholithiasis, Mirizzi syndrome type IV, and duodenal diverticulum.

CASE REPORT

A 49-year-old female patient with no history of alcoholism, smoking, drug use, or medication intake, and no infectious or contagious disease history, presenting only a prior diagnosis of cervical cancer made 10 months ago, managed surgically with a radical hysterectomy performed 10 months ago, without adjuvant therapy.

She was admitted to the emergency department presenting with a 15-hour history of abdominal pain. The pain was located in the epigastric region, associated with nausea and vomiting on two occasions-that was translational, without radiation, and without fever. She also reported generalized jaundice that had been present for approximately 5 months, accompanied by pruritus. On physical examination, the abdomen was tender in the right

hypochondrium upon moderate and deep palpation, with a positive Murphy sign, and no signs of peritoneal irritation.

Ultrasound assessment revealed dilation of the intrahepatic and extrahepatic bile ducts, with choledochal ectasia containing echogenic material inside. A diagnosis of chronic calculous cholecystitis was made, without signs of recent exacerbation. Splenomegaly and changes indicative of chronic liver disease were also observed. Laboratory tests are shown in Table 1.

Table 1: Laboratory test.

Test	Result	Reference range
Leukocytes (white blood cells) (/µl)	17,100	4,500-11,000
Neutrophils (%)	91	40-60
Hemoglobin (g/dl)	11.2	Men: 13.8-17.2
		Women: 12.1-15.1
Platelets (/µl)	215,000	150,000-450,000
Glucose (mg/dl)	97	70-99
Creatinine (mg/dl)	0.5	0.6-1.2
Blood urea nitrogen (BUN) (mg/dl)	21	7-20
Prothrombin time (seconds)	11.9	11-13
INR	0.9	0.8-1.1
Total bilirubin (mg/dl)	7.16	0.1-1.2
Direct bilirubin (mg/dl)	4.6	0.0-0.3
Indirect bilirubin (mg/dl)	2.4	0.1-1.0
AST (U/l)	68	10-40
ALT (U/l)	109	7-56

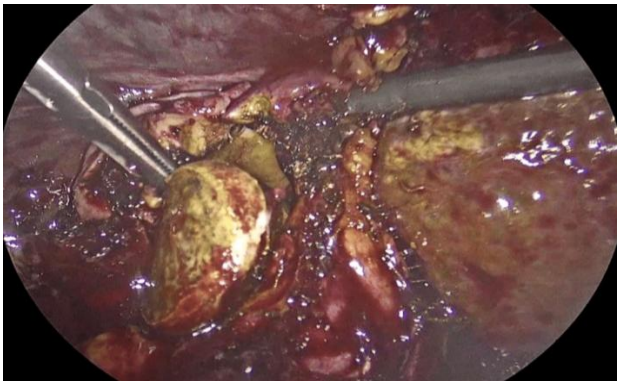

Figure 1: Opening of an atrophic gallbladder fused to the main bile duct due to Mirizzi syndrome, with manual removal of large stones.

The patient was hospitalized under the general surgery service for moderate acute cholangitis and, based on strongly positive criteria per the ASGE guidelines for choledocholithiasis, was considered a candidate for ERCP. During the procedure, a duodenal diverticulum in the second portion and an intradiverticular Vater's papilla were observed, but cannulation was unsuccessful, so the study was concluded. She was then considered for surgical exploration of the biliary tracts versus rendezvous ERCP, and scheduled for the laparoscopic surgical procedure. Laparoscopic exploration of the biliary tract was performed, revealing a sclerosed gallbladder, Parkland stage 4, Mirizzi syndrome type IV, with the presence of over 4 bile stones measuring more than 1 cm, and a common bile duct with viscous, purulent bile upon incision, managed with a hybrid approach involving endoscopic access to the common bile duct and placement of a 10 French plastic stent (Figures 1-4).

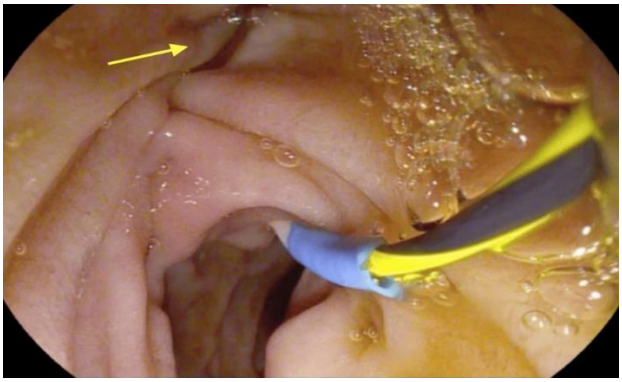

Figure 2: Guide wire for endoscopic biliary cannulation (yellow arrow shows the duodenal diverticulum).

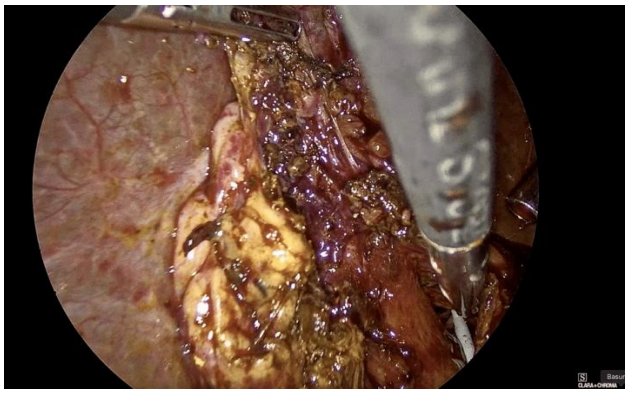

Figure 3: Laparoscopic visualization of biliary stent

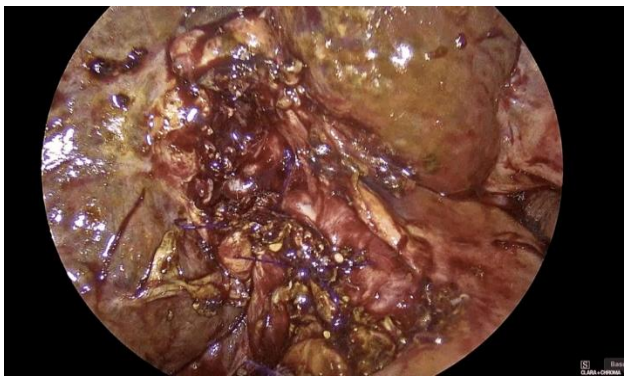

Figure 4: Closure of remnant with interrupted slow-absorbing suture.

The patient remained hospitalized for a total of 10 days, including 4 postoperative days, with no complications. Discharge was decided due to clinical improvement, with the Penrose drain removed after 6 days. Follow-up in outpatient consultation showed no relevant issues.

DISCUSSION

Regarding Mirizzi syndrome type IV and duodenal diverticulum, the literature does not specifically address the use of the rendezvous approach in these complex scenarios. Mirizzi syndrome type IV, characterized by a cholecystocholedochal fistula involving more than two-thirds of the bile duct circumference, typically requires more advanced surgical management, often with open biliary reconstruction. The presence of a duodenal diverticulum can complicate endoscopic access and increase the risk of complications during ERCP. While the rendezvous approach may be attempted in select cases, these situations are not well represented in the current evidence base, and the approach should be individualized based on intraoperative findings and surgical expertise.[4] This case illustrates the significant challenges associated with managing complex biliary pathologies such as Mirizzi syndrome type IV compounded by cholecystocholedochal fistula and the presence of a duodenal diverticulum. Mirizzi syndrome, especially type IV, often necessitates advanced surgical management due to extensive inflammation, fibrosis, and the involvement of adjacent structures, which typically preclude simple cholecystectomy and may require reconstruction. Traditionally, such cases have been managed via open procedures, including biliary reconstruction, to ensure complete removal of the pathological tissue and prevent complications such as fistula formation or bile duct injury.

The demographics for patients undergoing complex biliary interventions after failed ERCP (CPRE) are well documented in large national datasets. Patients tend to be predominantly middle-aged, with a slight female preponderance, often in their 40s to early 50s, although these demographics may shift slightly depending on the indication and comorbidities. Women are more frequently affected by gallstone disease but may have a lower incidence of associated comorbidities compared to men, who tend to present with more complicated biliary pathology, especially at older ages. Racial and ethnic variations are less consistently reported, but in the United States, most cases requiring advanced biliary intervention are performed in metropolitan centers, with younger patients more likely to have private insurance and older patients covered by Medicare. In scenarios where standard ERCP fails-due to anatomical distortion, previous surgeries, or complex disease such as Mirizzi syndrome-minimally invasive surgical approaches, including subtotal or reconstructive laparoscopic procedures combined with rendezvous techniques, have become increasingly important.

The rendezvous technique, which involves intraoperative endoscopic guidance through the cystic duct to facilitate precise biliary cannulation, has shown promise in achieving stone clearance and bile duct decompression. While extensive literature supports its safety, feasibility, and benefits-such as reduced postoperative morbidity, shorter hospital stays, and lower rates of post-ERCP pancreatitis-much of this data pertains to less complex stones. Its application in challenging cases like stage IV Mirizzi syndrome, concomitant duodenal diverticulum, or when previous interventions have failed, remains limited but promising, especially given the anatomical challenges posed by inflammatory or distorted biliary anatomy. These approaches exemplify the evolving role of advanced minimally invasive techniques in managing complex biliary stone disease refractory to conventional endoscopic methods.[5,6]

Management of these complex cases should be tailored to the individual patient, with consideration of alternative surgical or endoscopic strategies as appropriate.[1-4]

CONCLUSION

This case exemplifies the complexities involved in managing advanced biliary pathology, specifically cholecystocholedocholithiasis complicated by Mirizzi syndrome type IV and coexisting duodenal diverticulum. The successful application of a subtotal reconstructive laparoscopic cholecystectomy combined with a rendezvous approach underscores the feasibility and safety of minimally invasive techniques even in highly challenging scenarios. The novel integration of surgical and endoscopic strategies allowed effective management of difficult anatomical conditions, reducing the need for open surgery and minimizing patient morbidity.

Given the rarity and complexity of this presentation, it highlights the importance of individualized treatment plans and a multidisciplinary approach. Nonetheless, the limited existing evidence on the use of rendezvous techniques in such severe cases suggests a need for further research. Future studies should focus on evaluating long-term outcomes, optimal procedural modifications, and patient selection criteria to refine these strategies and improve care quality for similar complex cases

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