

## Case report

**Acute Cholecystitis after Cholecystectomy: Case Report**

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**Abstract**

**Introduction:** In the presence of complicated acute cholecystitis with a high risk of biliary tract injury, the laparoscopic technique of choice is the subtotal cholecystectomy. It is a safe and useful surgical procedure when the anatomical distortion hinders a total cholecystectomy. However, the presence of a vesicular remnant after performing a reconstituting technique can lead to the formation of cholelithiasis and acute cholecystitis of the remnant in a postoperated patient. **Case presentation:** It is a 51-year-old female patient who was admitted to the emergency room due to abdominal pain located in the mesogastrium and irradiating to the right hypochondrium, it was characteristic of biliary colic, with a pain scale chart of 9/10 points. It was triggered after eating copious foods, accompanied by nausea and vomit. Her surgical history was remarkable for a cholecystectomy 10 years prior to her admission. The laboratory tests and imaging studies suggested the presence of gallbladder remnant cholecystitis after a reconstituting subtotal cholecystectomy. The patient received surgical treatment by a total laparoscopic cholecystectomy with satisfactory results. **Conclusion:** A high level of suspicion of gallbladder remnant cholecystitis in patients that present to the emergency room for abdominal pain and a history of a reconstituting subtotal cholecystectomy has to be maintained. In these cases, surgical treatment by laparoscopic or open cholecystectomy has to be offered to the patient.

**Keywords:** cholecystectomy, neuroma, cholecystitis, acute

**Introduction**

For several years, the laparoscopic technique has replaced the traditional open cholecystectomy, considering it the standard of care in patients with acute cholecystitis [1]. Laparoscopic surgery provides better results and lower morbidity and mortality rates, as well as shorter hospital stays [1]. During laparoscopic surgery for acute cholecystitis, it is essential to first identify the cystic duct, the cystic artery, and perform a careful dissection of the Calot triangle before ligating and cutting the necessary structures for gallbladder removal [2]. The identification of the anatomical structures is known as the critical view of safety or Strasberg's critical vision. It is carried out with the objective of minimizing the risk of biliary or vascular injury during a laparoscopic procedure [2]. How-

ever, there are clinical situations such as severe inflammation, empyema, gangrene, perforation, Mirizzi syndrome, and liver cirrhosis, or the presence of anatomical variants of the bile duct that hinder the correct identification of these structures and increase the risk of intraoperative complications [3-5]. In the presence of such scenarios, the surgeon may be facing a case of complicated acute cholecystitis [5]. In cases of complicated acute cholecystitis, a subtotal cholecystectomy (either laparoscopic or conventional) is indicated as it is considered a useful, safe, and practical alternative for both the patient and the surgeon [5].

Subtotal cholecystectomy consists in the extraction of cholelithiasis and the removal of a portion of the

gallbladder without performing an extensive dissection of neck, the spiral part of the cystic duct, and the biliary tract [6]. This technique helps to prevent damage to adjacent anatomical structures in a scenario of complicated acute cholecystitis [6]. There are two surgical techniques for subtotal cholecystectomies: 1) fenestrated subtotal cholecystectomy, and 2) reconstituting subtotal cholecystectomy. Both techniques can be performed laparoscopically or with open surgery [7]. The difference between these techniques consists in the creation of a vesicular remnant with cauterization of the posterior wall of the vesicle, accompanied by a safety shield before reaching the bile duct known as the McElmoyle's shield in the reconstituting subtotal cholecystectomy [8]. On the contrary, in the fenestrated technique, there placement of drains after cystic duct closure is carried out, and no vesicular remnant is made [7,9]. The persistence of a vesicular remnant in a reconstituting cholecystectomy, accompanied by the presence of functional mucosa, increases the risk of recurrence for cholelithiasis after a subtotal cholecystectomy [10]. Here we present a case of a patient that was admitted to the emergency department with acute cholecystitis after being subjected to a laparoscopic reconstituting subtotal cholecystectomy ten years prior. A review of the available literature related to the discussed case is also presented.

### Case Presentation

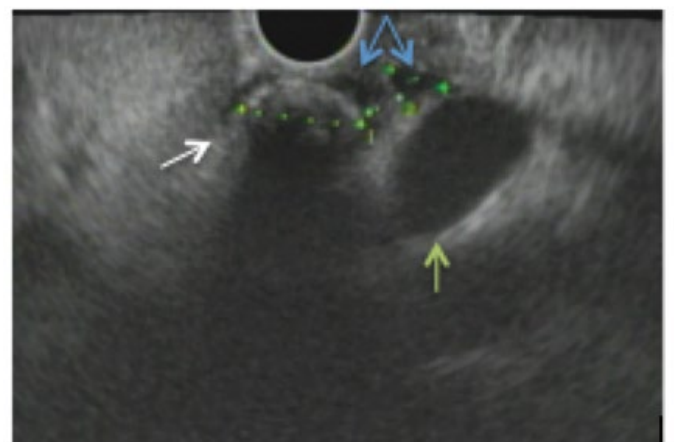
A 51-year-old woman, who was admitted to the emergency department with sudden abdominal pain after eating copious food. The pain had an intensity of 9/10 and it was located in the mesogastrium, irradiating to the right hypochondrium, and was accompanied by nausea and vomit on one occasion. Her past medical history was remarkable for an open appendectomy at 19 years old, three previous cesarean sections, and an open cholecystectomy ten years prior to admission. On physical examination, she presented slight abdominal distension, pain upon palpation located on the epigastrium and right hypochondrium, positive Murphy sign, normal peristalsis, and no other relevant data. Her laboratories showed hemoglobin of 15 g/dl, platelets of  $333 \times 10^3/\text{mm}^3$ , leukocyte count of  $7.3 \times 10^3/\text{mm}^3$ , INR of 0.99, TP of 10.7 seconds, glucose of 169 mg/dl, and creatinine of 0.72 mg/dL. The liver function tests revealed the following: total bilirubin of 1.01 mg/dL, direct bilirubin of 0.73 mg/dL, indirect bilirubin of 1.19 mg/dL, ALT of 183 U/L, AST 269 U/L, ALP of 198 U/L, GGT of 757 U/L, LDH of 415 U/L, and lipase of 41 U/L. The rest of the laboratories were within normal limits.

A computed tomography (CT) scan of the abdomen revealed an image suggestive of a vesicular stump with two rounded hyperdense images of approximately 7 and 8 mm in the interior of the remnant (Figure 1). These images were characteristics of acute cholecystitis of a vesicular remnant. Therefore, it was decided to complement the diagnostic approach with an endoscopic ultra-

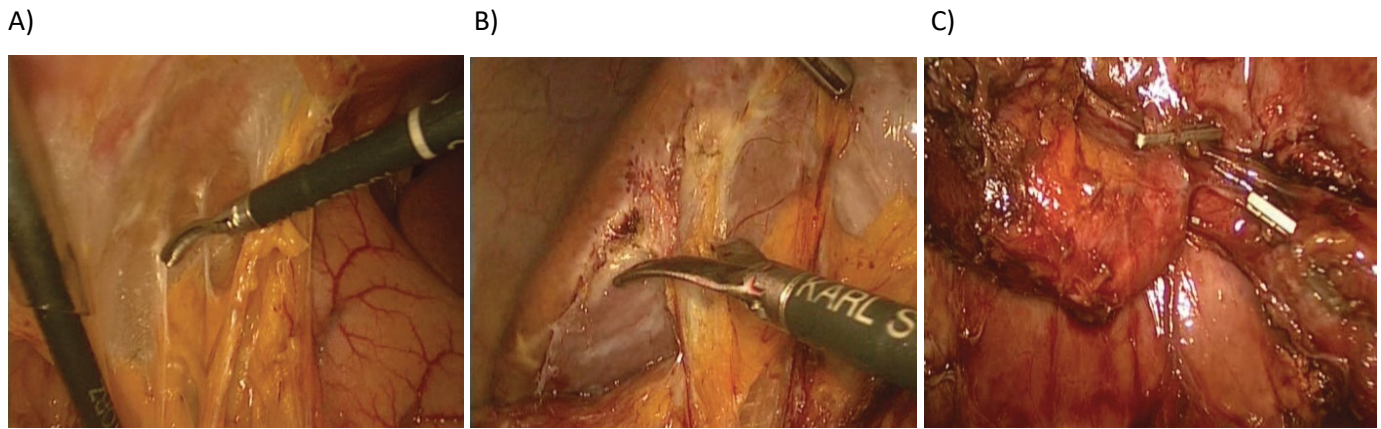
sound (Figure 2), which showed a vesicular remnant with a wall of 4mm thick, with perivesicular fluid, and two rounded hypoechoic lesions consistent with inflammatory perivesicular adenopathy. These findings, along with the clinical history and examination, helped reach the diagnosis of acute cholecystitis of the vesicular remnant from a previous subtotal reconstituting cholecystectomy. After diagnosis, surgical management was decided by laparoscopic technique (Figures 3 and 4). During surgery, multiple hepatocolic and hepatoduodenal adhesions were found. Also, a vesicular remnant of 2x1x1 cm in size with edematous wall and lithiasis in its interior, with an anterior cystic duct, and a posterior cystic artery were observed. The procedure was carried out successfully, without any complication. The patient presented with favorable evolution and was discharged from the hospital 4 days after surgery. The final pathology results reported a saccular specimen of 2x1x1 cm, presenting with a dark and smooth surface, clear and brown mucosa, and a line of surgical staples located at its free end. Also, two nodular stones measuring 1x1cm each were identified. The histopathological examination was compatible with chronic cholecystitis, cholecystolithiasis, and a focal traumatic neurooma of the vesicular wall (Figure 5).



**Figure 1. Computed Tomography of the Abdomen.** A) Axial image of the abdomen, where a vesicular remnant with interior stones is observed. B) Sagittal image where a vesicular remnant and the empty peripheral vesicular hepatic border of the gallbladder are observed.



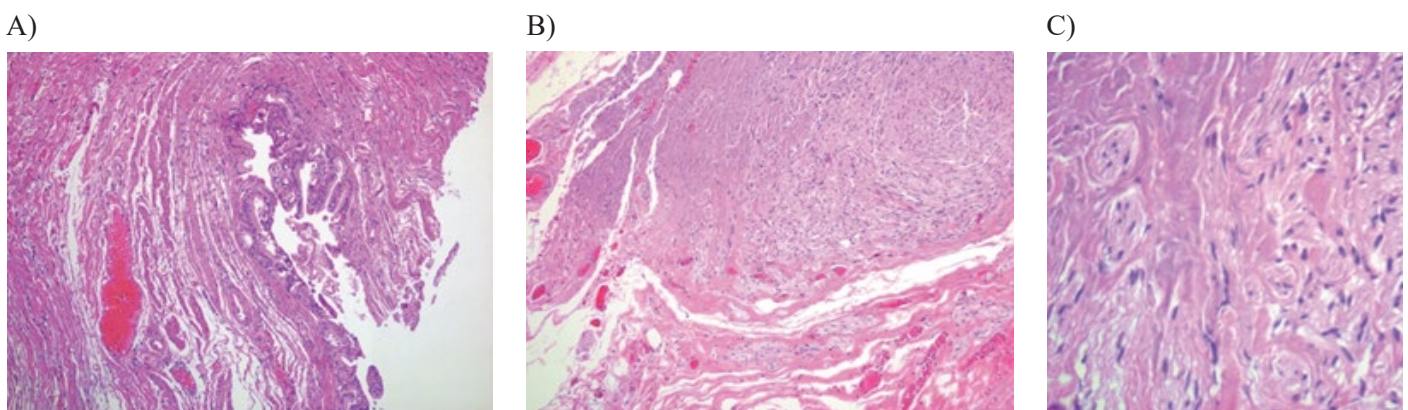
**Figure 2. Endoscopic Ultrasound.** The vesicular remnant is observed. The vesicular wall is approximately 4mm (white arrow), it is surrounded with perivesicular fluid (green arrow), and two lymphatic ganglia (blue arrows) are observed.



**Figure 3. Surgical Procedure: Total Laparoscopic Cholecystectomy.** A) Hepatocolic and hepatoduodenal adhesions. B) Dissection of the Calot triangle for subsequent identification of anatomical structures. C) Placement of surgical staples, cutting of the cystic duct and artery for further removal of the vesicular remnant.



**Figure 4. Macroscopic image of the Vesicular Remnant.** Surgical extraction of the vesicular remnant, measuring 2x1x1 cm.



**Figure 5. Pathology Evaluation of the Vesicular Remnant.** A) Presence of Rokitansky-Aschnoff sinuses – deep crypts of mucosa that reach the submucosa – indicative of chronic cholecystitis. B) Formation of a traumatic neuroma, secondary to the primary surgical procedure. C) Fibroblastic proliferation and collagen deposits, characteristic of chronic cholecystitis.

## Discussion

When the severity of inflammation impedes a safe dissection of the structures in order to observe the anatomical references necessary for the critical view of safety in patients with acute cholecystitis, due to the high incidence of anatomical variants, it is necessary to consider a subtotal cholecystectomy [11]. It has been reported that approximately 3.3 to 14% of all laparoscopic cholecystectomies are performed under a subtotal technique [7]. Depending on the type of subtotal cholecystectomy, there is a risk of re-appearance of acute cholecystitis, choledocholithiasis, and pancreatitis [12,13]. These morbidities could be present because the underlying pathophysiological process responsible for the onset of the first episode of acute cholecystitis was not completely eradicated. Therefore, it is fundamental to take into account the possible long-term complications when the decision of performing a subtotal cholecystectomy is made. Evidence suggests that when there is evidence of disease recurrence after a previous subtotal cholecystectomy, a series of endoscopic procedures such as an endoscopic retrograde cholangiopancreatography (ERCP), or surgery for a total cholecystectomy is required [12].

A comparison between the two subtotal techniques suggest that a reconstituting cholecystectomy represents less risk of injury to the bile duct than the fenestrated subtype [12]. Also, fewer infection rates in adjacent or intraabdominal organs, as well as lower incidence of wound infection and fewer days of hospital stay have been reported with the reconstituting technique [12]. For that reason, the reconstituting technique is sometimes preferred over the fenestrated cholecystectomy. However, it has been reported that in the long term, there is an increased risk of cholelithiasis, cholecystitis, and choledocholithiasis with the reconstituting technique, as the presence of a remnant, coupled with a remaining functional mucosa; represents a risk for long-term vesicular stone formation [12-14]. In the presented case, the presence of a vesicular remnant was evidenced by imaging studies, facilitating the diagnosis since the patient was admitted. However; clinical suspicion of recurrent acute cholecystitis after history of a complicated acute cholecystitis should always be suspected. Surgical treatment is not indicated unless there is sufficient clinical and imaging evidence that justifies a second intervention, since the altered normal anatomy of the bile duct and arteries after a partial or subtotal cholecystectomy, makes this procedure technically more complicated, implicating a higher risk for the patient.

## Conclusion

The presence of a vesicular remnant with functional mucosa after a reconstituting subtotal cholecystectomy increases the risk of long-term recurrent cholelithiasis, cholecystitis, or choledocholithiasis. Therefore, when a patient presents with a clinical history compatible with acute cholecystitis with a history of complicated cholecystitis and previous cholecystectomy, it is essential to carry out a detailed history and physical exam and to maintain a high diagnostic suspicion for recurrent cholecystitis.

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