Laparoscopic cholecystostomy tube-guided hepatotomy and cholecystolithotomy: alternative strategy for treatment of severe chronic cholecystitis

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ABSTRACT

Laparoscopic cholecystectomy can be a challenging procedure in gallbladders with chronic disease. We describe a patient with chronic cholecystitis and difficult visualisation of the gallbladder at surgery who underwent laparoscopic hepatotomy along the drainage tube of the cholecystostomy. In this way, the gallbladder was identified to avoid non-visualisation of ductal anatomy. This exceptional solution should be added to the surgical options if anatomical recognition is difficult and complete removal of the gallbladder is too risky.

KEYWORDS

Cholecystectomy – Cholecystolithotomy – Hepatotomy – Laparoscopy

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Chronic cholecystitis can be a surgical challenge due to an inflammatory process that creates multiple adhesions, complicates dissection, and can hamper recognition of normal anatomical structures.

We describe a 51-year-old male for whom elective cholecystectomy was planned due to acute cholecystitis. Inability to identify the gallbladder due to bowel adhesions over the liver necessitated an alternative surgical strategy. We suggest that this technique could be an addition to the surgical armamentarium to handle the ‘difficult gallbladder’, thereby obviating the need to revert to open surgery (or even to abort the procedure).

Case History

A 51-year-old male presented with a 3-day history of fever, chills, pain in the right upper quadrant, and anorexia. Ultrasonography demonstrated signs of acute cholecystitis with: a distended gallbladder; gallbladder wall of thickness 13 mm; impacted gallstone at the neck of the gallbladder. Free fluid around the gallbladder suggested a covered perforation.

Due to associated acute renal failure and lack of improvement upon antibiotic administration (i.v.), transhepatic percutaneous drainage of the gallbladder was undertaken, which resulted in rapid improvement. After cholecystography that assured good passage of contrast material from the

gallbladder to the duodenum, the drainage tube was closed and the patient discharged home. The patient was readmitted 2-weeks later for acute pancreatitis that was treated conservatively and which resolved uneventfully.

Surgical Technique

The patient was admitted 3 months after the first presentation for an elective laparoscopic cholecystectomy. Upon entry to the abdominal cavity, dense adhesions to the duodenum and transverse colon were found over the liver, which hampered visualisation of the gallbladder.

The tract of the drainage tube was used as a guide to the gallbladder. Using a hook diathermy hepatotomy along the tract of the draining tube was made until the cavity of the chronically ill gallbladder was entered. The gallbladder neck was obstructed by a solitary biliary stone (diameter, 2 cm), and was extracted. We attempted to suture the opening of the cystic duct from within the gallbladder cavity, but complete sealing was unsuccessful. Next, electrical fulguration of the gallbladder mucosa was done. Primary closure of the gallbladder was considered, especially after preoperative cholecystography showed the viability of bile passage to the intestinal tract. However, a decision to avoid closure of the shrunken gallbladder and to leave a closed suction drain was made to ensure good control of potential bile leakage (Fig 1).

Figure 1 Intraoperative image showing hepatotomy along the cholecystectomy tract

Postoperative Course

Postoperative recovery was swift. Bile drainage through the drain decreased gradually and stopped completely after 11 days. Ultrasonographic evaluation of the upper abdomen revealed no abnormalities, with no residual collection, and the drain was removed on postoperative day-19.

Discussion

For many years, laparoscopic cholecystectomy has been the 'gold standard' treatment of benign diseases of the gallbladder (primarily acute cholecystitis).¹ It is one of the most common surgical procedures, with a high prevalence of success and low level of risk in fit patients.^{2,3}

Early cholecystectomy is recommended for most cases of acute cholecystitis, but many surgeons prefer a scheduled procedure after treatment of acute symptoms, which can delay surgery for ~6 weeks.^{4,5} Hence, treatment initiation with antibiotics (i.v.) until resolution of symptoms is common.⁶ High-risk surgical patients or patients with severe disease are often considered for percutaneous drainage (usually undertaken *via* a transhepatic route) with delayed laparoscopic cholecystectomy.^{7,8}

Complete removal of the gallbladder is the standard procedure, but can be challenging and risky. Surgeons are often faced with gallbladder surgery that necessitates conversion from a laparoscopic to an open approach even though the latter does not guarantee a better anatomical view or superior approach to the shrunken gallbladder.⁹ Such cases are often discussed intraoperatively if the surgeon cannot complete the procedure him/herself. One option is to decide (intraoperatively) to abandon the procedure because it cannot be completed or if the risk of continuation outweighs the benefits for the patient.¹⁰

Studies have shown that gallstone removal is not as effective as complete removal of the gallbladder.¹¹ First reports of cholecystolithotomy emerged in the early 1950s,¹² but

this method was abandoned due to a high prevalence of complications and recurrence. Advances in radiological methods have allowed for percutaneous cholecystolithotomy that elicits good results in high-risk surgical patients and young children.¹⁵

Laparoscopic cholecystolithotomy as a treatment option for benign disease of the gallbladder has been investigated in only a few studies. Ooi *et al*¹⁴ described 4 patients for whom cholecystolithotomy was undertaken under laparoscopic guidance, with stone dissolution being undertaken in 3 of these cases. The procedure seems to be growing in popularity in China, with descriptions of good outcome in several series in recent years. Hu *et al* described 8 patients treated with a gas-less single-incision laparoscopic cholecystolithotomy for symptomatic gallstones. A clinical trial in China investigating outcomes between laparoscopic cholecystectomy and laparoscopic cholecystolithotomy with gallbladder preservation is expected to report by 2017.¹⁵ Studies focusing on cholecystolithotomy after hepatotomy for treatment of chronic cholecystitis are lacking. We believe that hepatotomy along the tract generated by the drainage tube is relatively safe because: (i) transhepatic drainage of the gallbladder usually involves only a small and superficial portion of the liver; (ii) liver tissue regenerates fairly rapidly, thereby ensuring good sealing of the gallbladder and prevention of bile leakage.

Only a few case reports have described fulguration of the gallbladder mucosa and its outcome. Andonian *et al*¹⁶ described a patient who underwent percutaneous cholecystolithotomy with fulguration of the mucosal wall of the gallbladder to defunctionalise the gallbladder mucosa, and good results were obtained. When leaving the gallbladder *in situ* (as in our case) mucosal fulguration is expected to lead to fibrosis and adhesions within the remaining cavity, thereby preventing gallstone recurrence.

Conclusion

This is the first time that laparoscopic transhepatic hepatotomy and cholecystolithotomy due to severe chronic cholecystitis has been described. This exceptional solution should be added to the surgical options if anatomical recognition is difficult and complete removal of the gallbladder is too risky. Avoiding high-risk bowel adhesions and unclear ductal anatomy allows for safe treatment. A transhepatic approach, along an existing cholecystostomy tube, may assist in location of a 'hidden' gallbladder. This procedure can be completed laparoscopically but, even if conversion is required, the same strategy can be applied.

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