CASE REPORT

Pitfalls in the use of laparoscopic staplers to perform subtotal cholecystectomy

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SUMMARY

Laparoscopic subtotal cholecystectomy (LSC) is considered to be a safe option in severe cholecystitis with non-discernible anatomy within the Calot's triangle where there is a potential risk of causing injury to the common bile duct. Here we present two cases of gallstone pancreatitis associated with use of an endoscopic stapler during LSC.

BACKGROUND

Laparoscopic subtotal cholecystectomy (LSC) is considered to be a safe option in severe cholecystitis with non-discernible anatomy within the Calot's triangle where there is a potential risk of causing injury to the common bile duct (CBD).¹ Deploying the endoscopic linear surgical stapler device (Endo-GIA, Ethicon, West Lothian, UK) across the gallbladder neck is one method of dealing with a difficult dissection. However, there are certain pitfalls with this technique which is illustrated in the two cases discussed below.

CASE PRESENTATION

Case 1

A 59-year-old gentleman presented with acute cholecystitis and underwent a laparoscopic cholecystectomy (LC). Prior to the operation, an ultrasound demonstrated a CBD of normal diameter with no stones seen within it. During the operation the dissection could not safely identify the anatomy of Calot's triangle and therefore an Endo-GIA was used to divide the gallbladder at Hartmann's pouch. He was discharged the following day. He represented 6 weeks later with a 1-day history of epigastric pain and vomiting. His observations were normal but on examination he had tenderness in the epigastric region.

Case 2

A 43-year-old lady presented with acute cholecystitis and underwent an emergency LC. Preoperative ultrasonography of the biliary tree demonstrated a normal diameter CBD with no stones seen. During the operation, Calot's triangle could not be safely dissected and therefore an Endo-GIA was used across Hartmann's pouch. The patient was discharged the following day. She represented 3 weeks later with epigastric pain and vomiting. On examination, she had generalised abdominal tenderness with guarding in the epigastric region.

INVESTIGATIONS

Case 1

A full set of blood tests was performed that demonstrated a white cell count (WCC) of 14.5×10^9 cells/l, a C reactive protein (CRP) of 9.9 mg/l, bilirubin of 68 $\mu\text{mol/l}$, alanine transaminase (ALT) levels of 326 IU/l, alkaline phosphatase (ALP) levels of 265 IU/l, γ -glutamyl-transferase (γGT) levels of 1058 IU/l and an amylase of 3772 IU/l.

A CT scan (figure 1) demonstrated severe necrotic pancreatitis, a remnant Hartmann's pouch and no biliary tree dilation or calculi.

Case 2

A full set of bloods tests was performed, showing a WCC of 18.1×10^9 cells/l, CRP of 18.2 mg/l, bilirubin of 138 $\mu\text{mol/l}$, ALT of 687 IU/l, ALP of 231 IU/l, γGT of 697 IU/l and an amylase of 6660 IU/l. An MR cholangio-pancreatogram showed evidence of pancreatitis, a remnant Hartmann's pouch but no stones seen in the CBD; however, the CBD was marginally dilated at 8 mm (figure 2).

DIFFERENTIAL DIAGNOSIS

Cases 1 and 2

- Gallstone pancreatitis
- Pancreatitis secondary to previous operative trauma

TREATMENT

Case 1

The patient was admitted to the general surgical ward for supportive management of his acute pancreatitis. At 48 h he had deteriorated with a Glasgow score of 3 (WCC, age and calcium) and he developed type one respiratory failure requiring intensive care unit (ICU) support.

Figure 1 Case 1: remnant Hartmann's pouch (arrowhead) with staple line superiorly.

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Figure 2 Case 2: with remnant Hartmann's pouch (arrowhead).

Case 2

The patient was admitted to the general surgical ward for supportive management of her acute pancreatitis. She was rehydrated, given pain relief and supportive care.

OUTCOME AND FOLLOW-UP

Case 1

The patient was managed conservatively and discharged from ICU after 2 weeks and currently remains well and on review in outpatients described no further episodes of pancreatitis or pain.

Case 2

The patient was managed conservatively and was discharged 11 days after admission. Although the CBD dilation was thought to be marginally high for their age in spite of the recent LC, her symptoms and biochemical evidence of biliary obstruction settled conservatively so no further investigation or treatment was undertaken. At the time of writing, the patient remains well and has been reviewed in outpatients with no further episodes of pancreatitis or pain.

DISCUSSION

In both cases described here an LSC was undertaken as dissection of Calot's triangle could not be safely undertaken and therefore an Endo-GIA stapler was deployed across Hartmann's pouch. Both patients' preoperative investigations including CBD diameter were normal therefore it is plausible that a residual stone in the remnant pouch may have passed through the CBD resulting in pancreatitis as an early postoperative complication. These small stones frequently pass through the ampulla and hence in both these cases stones were not seen in the CBD on subsequent radiological imaging.²

Hussain and Nagral³ described four cases of biliary pancreatitis postcholecystectomy, one of which was associated with an LSC; however, the remaining three were associated with either laparoscopic or open total cholecystectomy. The episodes of pancreatitis described in their cases were thought to be associated with long cystic duct stumps that contained residual stones.

The rationale for performing an LSC is to minimise risk of injury to the CBD and the hilum when Calot's triangle cannot be dissected safely. Methods employed include division across Hartmann's pouch as performed in this report. Another safe option is to perform a partial cholecystectomy with drainage of the remnant pouch. Injury to the CBD is one of the most serious complications in cholecystectomy and an LSC avoids this risk. However, a further laparoscopic/open resection may also be necessary for recurrent symptoms to remove the remnant pouch and stones.^{1 4}

Laparoscopic stapling devices are an effective method for performing an LSC or dividing a dilated cystic duct or neck of gallbladder due to its ease and speed of application. However, due to the wide blades of the stapling device, biliary stones may easily be squeezed distally into the CBD.⁵ To minimise the risk of stone migration, we recommend careful retraction of Hartmann's pouch to create angulation and gently compressing the cystic duct towards the gallbladder before closing the Endo-GIA to move any stones in the gallbladder body. Other safe options include opening the gallbladder to retrieve all stones before stapling^{5 6} or suturing the gallbladder closed after division at the level of Hartmann's pouch, although there is no evidence in the literature as to whether suturing of the gallbladder after opening and stone removal reduces the frequency of stone migration.

Learning points

- ▶ Laparoscopic subtotal cholecystectomy using a stapling device may be associated with delayed postoperative pancreatitis.
- ▶ This is probably due to small retained stones, either in a residual Hartmann's pouch or cystic duct stump.
- ▶ Stones can also be pushed proximally into the common bile duct during application of the stapler.
- ▶ Careful retraction of Hartmann's pouch and squeezing of any stones back into the distal gallbladder may reduce the incidence of postoperative pancreatitis.

Competing interests None.

Patient consent Obtained.

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REFERENCES

- 1 Sinha I, Smith ML, Safranek P, *et al.* Laparoscopic subtotal cholecystectomy without cystic duct ligation. *Br J Surg* 2007;94:1527–9.
- 2 Thurley PD, Dhingra R. Laparoscopic cholecystectomy: postoperative imaging. *AJR Am J Roentgenol* 2008;191:794–801.
- 3 Hussain M, Nagral S. Biliary pancreatitis secondary to stones from a gall bladder remnant. *Trop Gastroenterol* 2010;31:230–3.
- 4 Soleimani M, Mehrabi A, Mood ZA, *et al.* Partial cholecystectomy as a safe and viable option in the emergency treatment of complex acute cholecystitis: a case series and review of the literature. *Am Surg* 2007;73:498–507.
- 5 Lee MR, Chun HT, Roh YH, *et al.* Application of an endo-GIA for ligation of the cystic duct during difficult laparoscopic cholecystectomy. *Hepatogastroenterology* 2011;58:285–9.
- 6 Belgaumkar AP, Carswell KA, Chang A, *et al.* The dangers of using stapling devices for cystic duct closure in laparoscopic cholecystectomy. *Surg Laparosc Endosc Percutan Tech* 2009;19:e194–7.

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