



Laparoscopic Subtotal Cholecystectomy is a Safe Rescue Procedure: A DGH Experience

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Abstract

Introduction: Laparoscopic subtotal cholecystectomy was developed overtime to become an important rescue procedure in hostile gallbladders. Growing reports are proving its safety and value. This retrospective review describes our experience of LSC in a busy DGH.

Methods: 33 Patients' who underwent LSC between 2013 and 2018 were picked from a prospectively collected database. Patients' notes and electronic records were used to gather the data.

Results: The indications for SLC are acute inflammation were acute inflammation and dense adhesions at the Calot's triangle. 10 patients had their procedures acutely and 23 had their operations done on an elective basis. The gallbladder remnant was closed on 19 patients and was left open in 10 of them. A bile leak has happened in all of the cases, but only 7 patients needed ERCP to control the leak. The patients who had ERCP had a longer duration of hospital stay with an average of 12.4 days compared to those who had no ERCP (4.7). Three patients were readmitted for reasons not directly related to the procedure. Two patients returned to theatres.

Conclusion: The results of this retrospective review suggest that LSC is safe and associated with satisfactory long-term outcomes.

Keywords: Laparoscopic subtotal cholecystectomy (LSC); Gallbladder; Laparoscopic cholecystectomy

Introduction

Symptomatic gall stone disease is a global health problem that affects 1% to 4% of the population of the Western world every year [1]. Laparoscopic cholecystectomy was first described by Muhe and later modified by Mouret [2]. It is now accepted as the standard procedure for cholecystectomy.

Difficulty in performing the procedure happens in cases with severe inflammation of the gall bladder or dense adhesions at the Calot's triangle. In those situations interpretation of the anatomy maybe difficult and dissection of individual anatomic structures may become unsafe. Many alternative approaches to the "hostile gallbladder" have been suggested. Conversion to an open operation was once regarded as the safest option, but it doesn't always provide a better view and the surgeons are refraining from it as they become less familiar with the approach. Changes in the strategy as antegrade (fundus first) dissection or even drainage of the gallbladder have all been advocated [3]. Laparoscopic Subtotal Cholecystectomy (LSC) is an alternative safe approach which is advocated in many studies, with some recent modifications as omental plugging of the cystic duct [3]. This retrospective review describes our experience of LSC in a busy DGH.

Methods

Approval for the study was obtained from the audit department at our institution. Data was obtained from a prospectively collected database for all the patients who underwent laparoscopic cholecystectomy in the period from May 2013 to May 2018. The code used to search the targeted group was subtotal cholecystectomy. Patients case notes and electronic records were used to gather the needed information. The data was gathered on an Excel spread sheet and calculations were made accordingly.

Results

Demographics

A total of 33 cases were identified. There were 14 females and 19 males. The mean age was 62.8 years with a range of 31 to 83 years.

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Operative indications

All the patients were listed for laparoscopic cholecystectomy. The indications for subtotal cholecystectomy were either severe acute cholecystitis or dense adhesions. A total of 10 patients had acute cholecystitis, one of them had a perforated gall bladder and 2 were cholecystitis associated with a liver abscess related to the gall bladder. Of the 33 cases reviewed, 20 had dense adhesions obscuring the anatomy. Three, patients had choledocholithiasis and the stones either passed spontaneously or dealt with using ERCP before the operation. In patients with acute cholecystitis the operations were all urgent, while in patients with dense adhesions the procedures were all elective. Empyema of the gall bladder was described in 21 cases. Mirizzi syndrome was described in 6 of the patients. A gangrenous gall bladder was described in 7 patients. The average operation time was 121 min.

Operative technique

Standard procedural technique was used with slight differences among the surgeons. After Gaining a safe access and creation of pneumoperitoneum. The critical view was sought and once deemed unattainable the G.B wall above the Hartmann's pouch was incised using either an Endo-Scissor or a hook diathermy. This incision was extended to the fundus of the G.B, and was followed by evacuation of the contents and removal of all the stones. An attempt at dissecting the G.B off the liver was made and when successful to the level of the Hartmann's pouch the pouch would have been closed or left open.

The Hartmann's pouch was left in situ in 16 patients, and that was the level where the gall bladder was transected. In 15 of the patients the posterior wall of the gall bladder was left in situ and finally diathermized to remove the mucosa. Details for 2 of the patients were missing as not enough information was found to describe the gall bladder remnant.

The G.B remnant was closed in 19 patients and was left open in 10 patients. In 4 patients; operative details didn't state clearly whether it was closed or not. All of the patients had a drain at the end of the procedure, which was used to estimate the volume of bile leak.

Post-operative bile leak and ERCP

Minor bile leak that has settled without intervention was observed in 25 of the patients. A major bile leak that needed an ERCP was seen in 7 patients, significant data was missing on 1 patient to describe what sort of bile leak did happen. The average hospital stay was more in the group with a major bile leak that needed an ERCP as it was 12.4 days while it was 4.7 days in the group that didn't need an ERCP. In the ERCP group most of the procedures were elective (5 patients). The indication for LSC was dense adhesions in most of the patients needed ERCP (5). Empyema was found to be in 6 of the patients in the ERCP group. The remnant gall bladder was closed only in 2 patients in the ERCP group, 5 had the remnant gall bladder left open.

Readmission

Thirty patients were discharged without the need for readmission, 3 patients needed readmission for various reasons. One was readmitted with chest infection. An interesting finding was that a patient was admitted few months later with metastatic gall bladder cancer presumably on the remnant of the G.B. This is despite the fact that the primary histology of the resected part of the G.B didn't show cancer. The third readmission was for a minor wound infection.

Table 1: Patients and treatment characteristics.

Sex	Male	19
	Female	14
Age (years)		62.8 (31 to 83)
Timing of surgery	Acute	10
	Elective	23
Operative findings	Dense adhesions	20
	Acute inflammation	10
	Empyema	21
	Mirizzi syndrome	6
	Gangrenous gallbladder	7
	Perforated gallbladder	1
	Liver abscess	2
Gallbladder remnant	Closed	19
	Left open	10
	Missing data	4
Operative time (Minutes)	Acute	139 (60 to 236)
	Elective	113 (39 to 171)
Post-op complications	Bile leak needing ERCP	7
	Bile leak not needing an ERCP	25
	Re-operation	2
	90 day mortality	0
	CBD stones	3

Re-operation and other complications

Post-operative percutaneous drainage was not needed for any of the patients. Reoperation was needed in 2 patients one of them developed an infected hematoma post-operatively and the other was for residual symptomatic gall stones in the G.B remnant and a completion cholecystectomy was attempted many months later.

No patient developed iatrogenic injury of the CBD and there were no cases of post-operative mortality in the cohort up to 30 days post-operative.

Results of the patients' characteristics, treatment techniques and outcomes are summarized on Table 1.

Discussion

Madding first reported Subtotal cholecystectomy in 1955 as an alternative rescue procedure in difficult gall bladders [4]. It did mature to become an established exit strategy for difficult gall bladders in the laparoscopic era. Recently Strasberg et al classified the methods of subtotal cholecystectomy as "fenestrating" or "reconstituting" [5]. Both methods involve leaving behind the cystic duct and may be Hartmann's pouch and part of the gallbladder for fear of injuring the Common Bile Duct (CBD). In the reconstituting type the gall bladder remnant is closed. However, avoiding the risk of injuring the CBD happens at the expense of tolerating other possible complications. Bile leak is one of the most significant complications following Laparoscopic Subtotal Cholecystectomy (LSC); it is estimated to happen in 1% to 4% of cholecystectomies [6]. Adverse events that could happen following a bile leak are like subphrenic collections, pneumonia, biliary peritonitis, sepsis and the need for invasive therapy as ERCP to treat the bile leak.

Though bile leakage following LSC could settle on its own, occasionally it needs ERCP to treat it. ERCP is used for endoscopic stenting, sphincterotomy or a combination of the two. The theory is that promoting bile to flow along the natural passage to the duodenum minimizes flow through the cystic duct and allows it to heal. It's not quite understood why in some cases bile leak would stop on its own without ERCP and in others it is absolutely needed.

Bile leak was described to be the most common complication following subtotal cholecystectomy [6]. Being obliged to leave the cystic duct open or close in a less than optimum fashion made this a very likely possibility. In a recent Systematic review of 30 studies with data from 1231 patients Elshaer et al. described the incidence of bile leak of 18%. This has resolved spontaneously only in 5.6% of the patients in a period of 4 to 12 days without intervention [6]. ERCP remained the gold standard procedure to resolve the leak used in 31.4% of the patients on his review data. In the current literature there isn't enough evidence as to when this should be adopted or what volume of leak is likely to require this invasive procedure? The risk factors for a large leak that could predict the likely need for an ERCP aren't really looked at.

Our case series is assumed to be a descriptive study to raise some interesting questions in the way of managing patients with this difficult problem. In our series the need for an ERCP was on 7 patients (21.2%), which is less than the need in the bigger series. The larger number of patients with bile leak has their leak resolved with no intervention (78.8%). This coincides with the other larger studies and systematic reviews [7,8].

Statistical analysis of this cohort wouldn't result in any causation relationship, but rough calculations denote some interesting findings. Most of the patients who had an ERCP had Empyema of the gallbladder that is certainly a frequent observation in this cohort. Most of the patients in the ERCP group were done, as elective and dense adhesions at the Calot's triangle were the main reason for LSC. The need for ERCP has made the average duration of hospital stay significantly more than the group who doesn't need an ERCP.

The study further strengthens the safety and usefulness of LSC as a rescue procedure in difficult gallbladders. No drastic complication as CBD injury was encountered and no mortality was recorded as related to the procedure.

A limitation of the study is the small number of patients from a single institution made it impractical to make any credible statistical inferences or conclusions. But it did open the door for important questions to be addressed in larger series.

Conclusion

The results of this retrospective review suggest that LSC is safe and associated with satisfactory long-term outcomes. It is indicated in patients with dense surrounding adhesions often in association with acute inflammation. Not surprisingly many patients develop a temporary bile leak following the procedure but this is easily managed without the need for further surgical intervention.

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