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Clinical outcome of subtotal cholecystectomy for difficult gallbladder: Experience of GIT and hepatology teaching hospital, medical city, Baghdad, Iraq

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***Abstract*---**When the Calot triangle structures cannot be found and a critical evaluation of patient safety cannot be achieved, surgeons perform a subtotal cholecystectomy (SC). objective Evaluation and analysis of the outcomes of subtotal cholecystectomy at the GIT and Hepatology teaching Hospital is to be conducted. Retrospective analysis of patient data and research methodologies thirteen hundred and eighty onsecutive cholecystectomy patients at GIT & Hepatology Hospital (Oct.2017 to Apr.2020). 53 of the 1380 people investigated underwent a partial cholecystectomy. Routine laparoscopic or open cholecystectomy patients (13.27) could not be included in the study. An individual patient's medical history is mined for information on their preoperative features. Results 53 individuals had subtotal cholecystectomy, with 29 males (55.7%) and 24 women (24.8%) both undergoing the procedure (45.2 percent). Patients in the research, who ranged in age from 20 to 69, had an average age of 43.5 years. The bulk of the 45 patients (87.2%) had elective surgery, whereas only 8 (15%) had emergency surgery. There were 33 cases of laparoscopic subtotal cholecystectomy and only 20 cases of open subtotal cholecystectomy in this study (6 patients had conversion subtotal cholecystectomy). Postoperative bile leaks were found in 10 patients (18.8%), while two patients (both of whom had subhepatic collections) experienced bile leaks after surgery (3.7 percent). One patient had a

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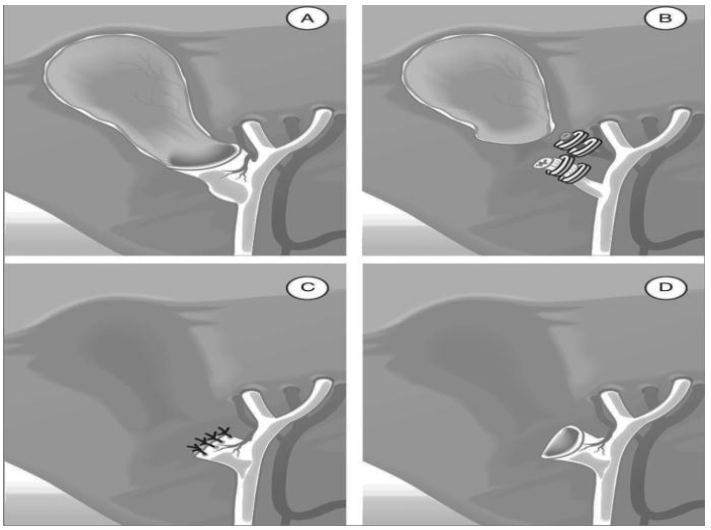
bile leak, two patients had to have their stents removed, and two patients had to have additional procedures because of retained stones. The average operational time for the LSC and OSC groups was 70 and 110 minutes, respectively. There was an open conversion rate of 11.3 percent. Death was a myth. The bile duct has not been damaged. Conclusion In patients with a high risk of complications, an open and laparoscopic approach to gallbladder removal has been demonstrated to be helpful and safe. An emergency or elective cholecystectomy using the laparoscopic approach known as LSC can help reduce the risk of complications, including bile canal injury and the necessity of conversion surgery, while retaining the other benefits of laparoscopic surgery.

***Keywords*---**indication, complication, total gallblaber surgery, difficult procedure.

Introduction

It took Carl Johann August Langenbuch 16 years to operate on a 43-year-old gallstone patient and accomplish the first successful cholecystectomy. The gold standard treatment for cholelithiasis was open cholecystectomy (OC) until Philip Mouret from France performed the first human laparoscopic cholecystectomy in 1987. (2) No matter whether an open or laparoscopic cholecystectomy is performed, the components of Calot's triangle must be dissected safely. In patients with acute or chronic inflammation and omental adhesions, cirrhosis of the liver, or gallbladder gangrene, Calot's triangle dissection carries a high risk of biliary artery injury. Open surgery is the most practical response to a particularly difficult procedure. (3) and (4)... If anatomical traits are ineffectively utilized,During laparoscopic cholecystectomy, surgeons are frequently faced with difficult scenarios such the Mirizzi syndrome, severe cholecystitis, and liver cirrhosis that cannot be identified or the critical view of safety cannot be obtained. As a result, the risk of surgical complications and bile duct injury increase. (5,6,7). Cholecystectomy is like flying in clear weather with no variations from the standard procedure for takeoff, navigation, or landing. Depending on the severity of the weather, a trip like this must be modified. The flight may be canceled if the weather does not improve (if such information is available beforehand). Pilots have a variety of options for rerouting in the event of poor weather. There are a number of ways a pilot might get back to their starting point, fly around bad weather, or divert the plane to a different route in order to reach their destination (8). Passenger safety is a concern for each of these solutions. Instead of finishing the voyage, the safety of passengers should be given top priority (i.e., safety first). There is no reason to endanger the patient's biliary and vascular systems by doing a total cholecystectomy with a troublesome gallbladder. Bailout measures must be utilized if the surgeon is unable to complete the procedure safely. Using any one of the five techniques (9-11-12), the gallbladder can be saved Only STC (open/laparoscopic) and FFC (fundus first cholecystectomy) can be carried out laparoscopically. Total cholecystectomy As a result, these techniques are becoming more commonly approved for decreasing the morbid consequences of difficult GB, particularly CBD injuries, on a countrywide basis. (13). An interim

treatment for severely inflamed or empyematous gall bladders, this surgery decompresses the gall bladders. To better detect Calot triangle structures, the fundus-first approach employs an infundibulum-first dissection, which begins at the GB's fundus. A subtotal cholecystectomy (SC) is a surgical operation that removes only the parts of the bile duct necessary to identify the Calot triangle and gain a critical viewpoint on safety. This is number seventeen. The first description of an open subtotal cholecystectomy was published in 1985 by Bornman and Terblanche (18). The technique was performed laparoscopically in 1993. (19). Patients with a very inflamed gallbladder can now get laparoscopic gallbladder surgery. Laparoscopic subtotal cholecystectomy is a typical treatment for severe cholecystitis (LSC). Innumerable studies have shown that it's risk-free, efficient, and doable (20). In comparison to open cholecystectomy, LSC was related with less postoperative pain, shorter hospital stays, and a lower risk of incisional hernia (20,21). There are four basic classifications based on the preservation of the posterior wall, the extent of dissection, and care of any remaining structures. In general, there are four distinct sorts of processes to choose from: There are three types of procedures: Type A preserves the posterior wall of a gallbladder bed that is attached to the gallbladder bed without closing it; Type B preserves this wall by sealing the gallbladder remnant; and Type C entails creating a dissection but not closing it of the gallbladder (Fig. 1).



In Fig. 1, we see the four different types of subtotal cholecystectomy: (A) with open remnant, (B) with closed remnant, (C) with closed remnant, and (D) open remnant without preservation of the posterior wall of the gallbladder.

A subtotal cholecystectomies can be split into "fenestrating" Fig. 2 and "reconstituting" types of surgery Fig. 3. However, subtotal cholecystectomy seals the lower end of the gallbladder, minimizing the risk of post-operative fistula, but leaves the gallbladder intact, which may lead to recurrence of cholecystolithiasis symptoms. Rather than suturing the cystic duct internally, subtotal fenestrating cholecystectomy may obstruct the gallbladder. Postoperative biliary fistula is more

common, but recurrent cholecystolithiasis does not appear to be linked to it. a total of twenty-two.

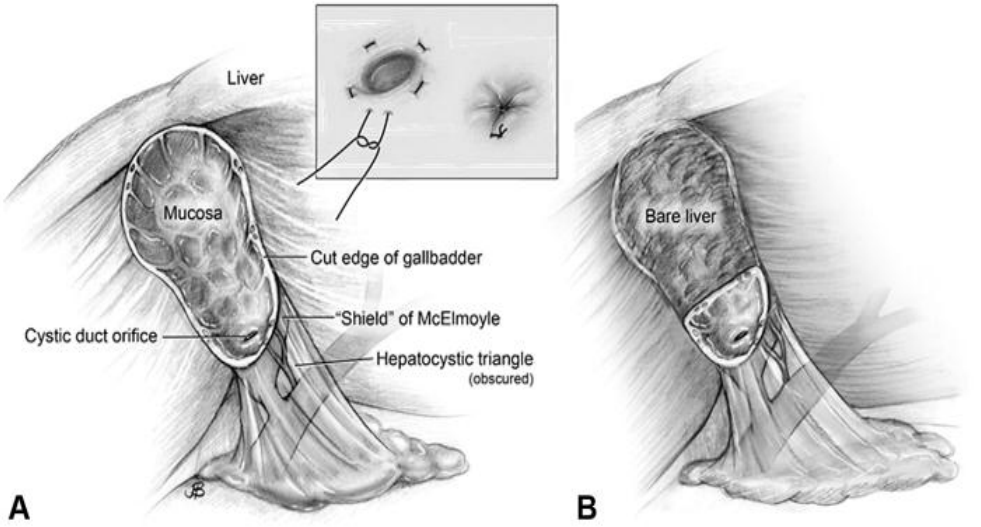


Fig. 2. As may be seen in Figure 2, which depicts the subtotal fenestrated cholecystectomy that was performed. Only a lip at the bottom of the gallbladder has been preserved after the free peritonealized portion of the gallbladder was removed. The "Shield" of McEl- moyle serves as a deterrent against unintentionally entering the hepatocystic triangle. The section of the gallbladder that adheres to the liver was left in place. Extraction is complete. The cut edge of the gallbladder may have been sewn too tightly. The mucosa is usually removed during surgery. A purse-string suture can be used to seal the cystic duct from the inside (inset). Attempts to ligate the cystic duct outside of the gallbladder may cause harm to the common bile duct if the cystic duct is too short. (B) Similar to Figure 2A, but with the exception of removing a section of the gallbladder attached to the liver.

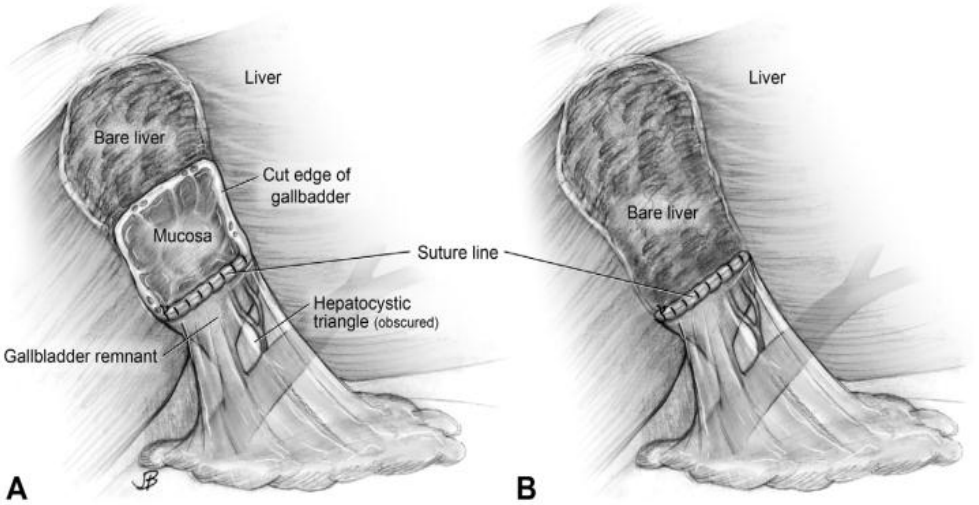


Figure 3 A partial cholecystectomy has been reconstructed in Figure 3. The free, peritonealized part of the gallbladder has been removed. Part of the gallbladder is removed from the liver in Figure 2A, whereas the entire gallbladder is removed from the liver in Figure 2B. Closing the lower portion of the gallbladder with sutures or staples creates an uninterrupted lumen. Here, we can only see the gallbladder's lower section. A fully closed lumen like that depicted in Figure 3A allows stones to grow. A "fenestrating" cholecystectomy occurs when the lower portion of a patient's gallbladder is left open (fenestrated) or closed (reconstituting) (reconstituting).

Research Purpose

At Gastroenterology and Hepatology Hospital, we are interested in the biliary and vascular consequences after subtotal cholecystectomy.

Methods and Patients

A look back at data that was collected in the future 1380 consecutive patients' data from the GIT & Hepatology Hospital's cholecystectomy program (Oct.2017 to Apr.2020). 53 individuals (3,8 percent) underwent subtotal cholecystectomy out of 1380 patients including 29 males (54.7 percent) & 24 females (45.2 percent). (45.2 percent). The majority of the 45 patients (84,99%) had elective surgery, whereas only 8 individuals (15%) had emergency surgery. Excluded from the study were 1327 patients who underwent standard laparoscopic (SLC) or open cholecystectomy (OC). Other significant surgeries, such as pancreaticoduodenectomy or hepatectomy, did not include cholecystectomies. Preoperative data for each patient is gleaned from their medical records and includes things like age, gender, test results, an abdominal ultrasound, and the patient's informed permission on the day of surgery. Pre-operative imaging using CT of the abdomen/MRCP was conducted in chosen patients. The surgical data, including the challenges encountered, procedure technique, estimated blood loss, operating time, and conversion, were documented. It was necessary to collect data

on post-operative outcomes such as the length of stay in an intensive care unit (ICU), as well as the number of patients who required further surgery and the number of patients who died within 30 days of the procedure. It was thought risky to approach Calot's triangle because of significant inflammation/distorted anatomy/frozen Calot or cirrhotic liver that SC (laparoscopic or open) was adopted based on intraoperative observations in order to minimize biliary problems. A procedure called the closed Hartmann's pouch was used in the majority of the patients in this series, as shown in Figures 2 and 3.

The surgical procedure: In each and every instance where LSC occurs, During surgery, patients are positioned in a reverse Trendelenburg posture with their backs to the surgeon, who stands to their left. It was necessary to employ four ports: two 10mm ports in the umbilicus, one in the epigastric region, and two 5mm ports in the right subcostal and anterior axillary lines. In order to expose the adhering structures to GB, a camera is inserted into the belly and an assessment of the right upper quadrant of the abdomen is carried out. LSC was attempted when the critical view of safety (CVS) could not be achieved despite the Calot's being exposed for more than 25 minutes. When the LSC proved unsuccessful, the decision was made to switch to open subtotal cholecystectomy. Traditionally, the fundus of the GB was first dissected using hook diathermy, ligasure, or harmonic knife, followed by dissection of its posterior wall. However, this procedure is only used when the posterior wall of the GB is adherent or the GB is severely contracted or intrahepatic, in which case the posterior wall is either left attached to the liver or transected at the level of Hartman's pouch. Direct OSC suturing was used to close the wound, as depicted in Fig 1. Washing was done with isotonic saline solution containing 0.9 percent and a catheter was left in the subhepatic region to drain the wound. One hour before surgery, all patients were given prophylactic antibiotics and anticoagulation therapy to prevent venous thrombosis. Six hours before to surgery, patients were administered LMWH. According to the amount of drainage approximately when it was less than 50 cc/day, drains were withdrawn in 28/53 patients on the second post-operative day. Patients who needed ERCP postoperatively for retained stones had their drains stayed longer. Every patient in this study who had undergone SC was contacted by phone and evaluated in the clinic if necessary. In addition to the rationale for subtotal cholecystectomy, the technique (closed vs open Hartmann's pouch), surgical time, blood loss and open conversion are all documented intraoperatively. Patients' post-operative features, such as early post-operative problems such as bile leakage and the need for intensive care unit (ICU) admission, as well as post-drain removal times and 30-day mortality rates.

Results

- Pre-operative findings: Subtotal cholecystectomy was performed on 53 patients.

29 of whom were male and 24 of whom were female (45.2 percent). Most of the cases were elective, with 45 patients (84.9 percent) and emergency, with a mean age of 43.5 years (20-69 years). Patients with resolving acute pancreatitis accounted for 15% of the total, while patients with obstructive jaundice accounted for 15% of the total. It was shown that 25 of the patients had ASA grades 2, 18,

18, 8 and 2, respectively. Tables 1 and 2 indicate the patient's demographics, preoperative findings, and ASA grade.

Table 1 lists the demographics of the patient and the physical examination findings that led to the surgery

Patient characteristics	*No=53*	%
Age	20	
Mean	_69Y	
sex	44.5Y	
M		54.7
F	29	45.2
Resolving acute	24	9%
pancreatitis	5	10.6
obstructive jaundice	9	17
Mirizzi's syndrome	7	
History of CBD stone	2	
Operation time in(mint)		84.9
Elective	45	15
Emergency	8	

Table 2. Patient ASA Grading

ASA	*No=53*	%
1	18	3.3
2	25	47.1
3	8	15
4	2	3.7

- Operative outcomes

33 patients (62.2 percent) underwent LSC, 20 patients (37.8 percent) with previous laparotomy scars, Mirrizi syndrome type 2 and more underwent OSC, (of them 6 patients had a conversion subtotal cholecystectomy after a trial of LC) which shows that conversion does not necessarily make the operation easier. When drains were utilized in all 40 patients (75.4 percent) who had LSC or OSC, the open Hartmann's pouch or fenestrated type was the most prevalent, whereas the closed Hartmann's pouch or reconsititutve type was used in only 13 patients (24.5 percent) who had OSC. Serious adhesions, acute inflammation, Mirizzi's syndrome, bleeding, severely contracted GB, emphysema, intrahepatic GB, and perforated GB were the most prevalent reasons for surgery, with 16 patients (30.1 percent) and 12 patients (16.9 percent) each receiving it (3,7 percent), In the LSC group, the average operating duration was 70 minutes, while in the OSC group, it was 110 minutes. There were no complications during the procedure, no duct damage, and no deaths. The open conversion rate was 11.3%. The results of the operation are shown in Table 2.

Operative results are shown in Table 3

Variable	No=53	%
Indication for subtotal cholecystectomy		
Severe dense adhesions	16	30.1
Acute Inflammation	12	22.6
Mirizzi's syndrome	9	16.9
Bleeding	6	11,3
Severely contracted GB	4	7.5
Empyema	2	3.7
Perforated GB	2	3.7
Intrahepatic GB	2	3.7
Types of subtotal cholecystectomy		
Laparoscopic Subtotal cholecystectomy LSC	33	62.2
Open Subtotal cholecystectomy OSC	20	37.8
Fenestrated technique	40	75.4
Reconsititutve technique	13	24.6
Mean Operative Time in Minuets		
LSC	70mint	
OSC	110mint	
Blood loss (mean)		
LST	70CC	
OSC	125CC	
Conversion	6	11.3

Table 3 summarizes the results of the post-operative period. There was an average of three days spent in the hospital for each patient (1 to 5 days). Ten patients had bile leaks, all of which happened promptly after surgery (18.8%). The leak was managed conservatively in seven of these patients, with two undergoing percutaneous drainage and one undergoing ERCP. 2 individuals (3.7%) were found to have sub hepatic collections, which were treated conservatively. Post-operative ERCP was necessary in 5 patients (2 for stent removal, in 2 for retained stone, and in 1 for bile leak). Reoperation was only required in 2 patients (3.7 percent) because of retained stone. Three patients (5.6 percent) had a postoperative wound infection, and they were all treated conservatively.

Table 4 shows the results of the operation

variable	No	%
ICU admission(day)	3	
Length of hospital stay mean	3 days	
Postoperative complications:		
Bile leak	10	18.8
Open Hartmann pouch	7	14.2
Closed Hartmann pouch	3	5.6
Subhepatic collections	2	3.7
Reoperation	2	3.7
Post-operative ERCP	5	9.4
Retained stone	2	3.7
Stent removal	2	3.7

Bile leak	1	1.8
Time of drain removal		
1 day	32	60
2 days	15	26
7 days	4	7.5
20 days	2	3.7
Wound infection	3	5.6

Discussion

When treating cholecystitis, achieving a "critical view of safety" by safely dissecting the structures in Calot's triangle can be a significant problem during laparoscopic as well as open surgeries. When the tissues in Calot's triangle become hostile during open surgery, partial cholecystectomy with drainage of the gallbladder stump may be employed. The teachings of open surgery can be used to laparoscopy, just as they can in many other areas of surgical practice. (23) .Conversion may still be necessary in the case of an extremely problematic gallbladder (GB) because LC has become the technique of choice for symptomatic biliary illness. Some cases, even after conversion, may not provide a better view of the anatomy or surgical planes to do a total cholecystectomy, increasing the risk of complications. (24) .It is analogous to studies by Minho shin et al. (25), Fatih kulen et al. (26), and others who reported operation times of 70 mint for LSC and 110 mint for OSC, respectively, in our study. Our study found a mean blood loss of 70,125 ml for LSC and OC, but Minho shin et al. found that LSC blood loss was 45 ml (25) .10.8% of patients had bile leakage after open Hartmann's pouch against 3.0% of patients who had bile leakage after closed Hartmann's pouch, according to our study. Postoperative bile leakage occurred in 10.6 percent of the LSC cohort studied by Henneman's group, with a significant bile duct damage occurring in only 0.02 percent (27). According to our LSC data, 18.8% of patients had bile leaks without any bile duct damage. ERCP and a sphincterotomy were commonly used to treat a bile leak when it was present, and this strategy generally resulted in leak resolution with minimal additional morbidity by first retaining the drain in place or introducing a new drain (28,29,30). Because of this, we feel the use of LSC in difficult cholecystectomies is a good "bail-out" method and an alternative to conversion. Post-operative ERCP was performed on 5 patients (9.4%) in our study, 2 of whom had a stent removed, 2 of whom had a retained stone, and one of whom had a bile leak. All patients recovered well and were in good general condition following surgery. According to Mohamed Elshaer et al., post-operative ERCP was used in 4.1% (including 58.6% for retained stones, 31.36% for persistent bile leak and CBD stricture or Mirrizi syndrome in their study (9. 8 percent). (31) Infection of the wound. Simple wound infection was found in three cases (5.6 percent) in our study, which was treated with antibiotics. (4.6 percent) is similar to Hamdy sedkly Abdullah's wound infection rate, which he reported in his study (32). nonetheless, a wound infection rate of 2.6% was found by Mohamed Elshaer et al (31). 3.7 percent of the patients in this study had a subhepatic collection, and both were treated with a conservative approach. A similar finding was made by Mohamed Elshaer in his work on subhepatic collecting (2.9 percent). (31) .Re-operation 7. Two patients (3.7 percent) underwent a second procedure to remove a retained stone in our study. It has previously been reported (2.7 percent) in prior studies, but peter Yoon et al.

(28) found that the rate of reoperation was significantly higher (4.3 percent). (33) .Duct-related injury Our investigation found no bile duct injury, despite the findings of peter Daechul Yoon et al. (0.2 percent) who reported bile duct injury (33). A mortality rate of 9.30%. There is no end to our lives. Mohamed Elshaer's study found that 0.4 percent of patients died (31).

Conclusion

There are some circumstances when a subtotal cholecystectomy is the best and safest option, such as those with a high-risk of complications that cannot be avoided. As it has morbidity rates comparable to total cholecystectomy in easy patients, it is viable, efficient, and can be used as a regular technique for challenging situations. An alternative to laparoscopic cholecystectomy, LSC has the advantage of less postoperative discomfort, less wound infection, and shorter hospital stays for patients who require an emergency or elective procedure, but also reducing potential for bile-duct injury and conversion rates.

Recommendation

There should be consideration of a subtotal cholecystectomy if a critical view of safety cannot be achieved, in order to avoid the consequences of the liver and vascular problems

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