Feasibility of laparoscopic cholecystectomy in patients with previous upper abdominal surgery

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Background and aim
There is still a considerable percentage of patients in whom laparoscopic cholecystectomy (LC) cannot be successfully performed and conversion to open surgery is required. The potential risks have dissuaded some surgeons from using the laparoscopic procedure in patients with symptomatic gallstones and previous upper abdominal surgery (UAS). The aim of this study is to investigate the impact of previous UAS on the successful performance of LC.
Patients and methods
Between September 2016 and September 2017, 50 patients with previous UAS and symptomatic cholelithiasis were subjected to LC. Intraoperative data regarding difficulties, duration of surgery, rate of conversion, and any incidental postoperative event were recorded.
Results
No mortality occurred. Adhesiolysis was not required in all cases. There were no complications directly attributable to adhesiolysis. Postoperative complications occurred in 12 (24%) patients. The procedure was completed laparoscopically in 44 patients with a 12% conversion rate.
Conclusion
Previous UAS is not a contraindication to safe LC, but is associated with an increased need for adhesiolysis, a longer operative time, an increased open conversion rate, and sometimes a larger number of trocars.

Keywords:
conversion to open surgery, laparoscopic cholecystectomy, upper abdominal surgery,

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Introduction

Laparoscopic cholecystectomy (LC) has revolutionized the care of the patient with symptomatic cholecystitis and cholelithiasis. The rapid acceptance of this technique among patients and surgeons leads to an explosion of minimally invasive surgical techniques [1]. This technique leads to a more rapid improvement in quality of life than open cholecystectomy with advantages of this procedure.

This technique has advantages over the open approach in terms of better cosmetic result, less postoperative pain, and shorter recovery time [2]. However, there are still a considerable percentage of patients in whom LC cannot be successfully performed and conversion to open surgery is required. A number of relative contraindications, such as morbid obesity, previous upper abdominal surgery (UAS), and acute cholecystitis, have been proposed in determining whether a patient is a candidate for LC [3].

When LC began in the early 1990s, pregnancy, previous abdominal surgery, obesity, cirrhosis, and acute cholecystitis were considered absolute contraindications for performance of the laparoscopic technique. As advances in laparoscopic skills and instruments have evolved, a range of increasingly complex procedures have been performed, making all of these traditional contraindications at best relative [4].

Standard LC involves access to the abdominal cavity through two or three incisions outside the umbilicus in the right upper quadrant. Up to 50% of patients undergoing attempted LC would have had prior abdominal surgery. UAS does not always result in adhesions preventing safe right upper quadrant access [5]. Previous abdominal surgery particularly is associated with difficulty placing the initial trocar and obtaining adequate exposure to the gallbladder. The potential risk for injury of organs adherent to the abdominal wall during Veress needle or trocar insertion as well as the necessity for adhesiolysis and its attendant complications are the two major specific problems constraining surgeons from performing LC for patients with previous abdominal surgery [6]. In this study, we wished to investigate whether a relatively

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large patient population would yield further important information on the impact of previous UAS on the successful performance of LC.

Patients and methods

This prospective study includes 50 patients who underwent LC for symptomatic cholelithiasis in the period between September 2016 and September 2017. All of these patients had a previous UAS through a midline or a paramedian incision, transverse, or oblique abdominal incisions (traumatic exploration laparotomy, splenectomy, perforated peptic ulcer, epigastric hernia, vertical band gastroplasty (VBG), open bariatric surgery). Exclusion criteria were American society of anesthesia (ASA) score more than III, patients with lower abdominal surgery, or surgery for malignancy. Written informed consent was obtained from all patients.

Operative procedure

LC was performed using the standard four-trocar technique. The initial access to the abdominal cavity was at the umbilicus in all cases either by a blind or open technique. The surgeon must consider the best means for obtaining access to the abdominal cavity.

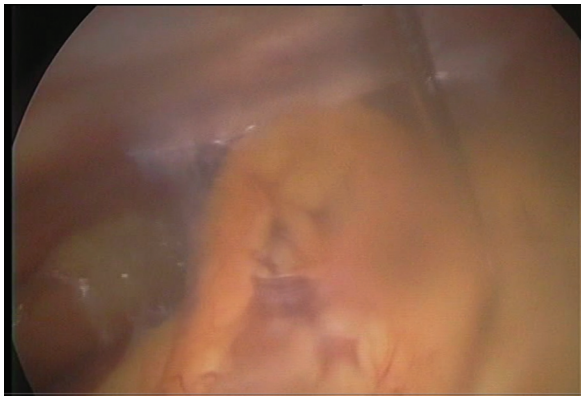
The Veress needle was inserted at the lower edge of the umbilical sulcus. The open (Hasson) technique for pneumoperitoneum creation and insertion of the initial trocar was used at the discretion of the operating surgeon. If adhesions were found under the umbilical incision, these were bluntly finger dissected. Once the peritoneal cavity had been entered, only adhesions preventing adequate visualization and insertion of the remaining trocars or those interfering with adequate access to the operative field and the performance of LC were dissected (Figs 1–4).

Blunt dissection and sharp or cautery dissection were used for the division of adhesions when necessary. The operating surgeon determined conversion to an open without any strict criteria other than safe adhesiolysis, adequate exposure of the operative field, and accurate definition of the relevant anatomy.

If the intestine is adhered firmly to the abdominal wall, the use of electrocautery for adhesiolysis involves the risk of delayed intestinal perforation from the heat. In those patients, it is safer to dissect the intestine together with a layer of the peritoneum. Because the bile duct may be displaced as a result of adhesions after gastrectomy, the cystic duct should not be divided until the common hepatic duct and common bile duct are clearly identified. If the cystic duct is difficult to identify, intraoperative cholangiography is performed. Black stones or calcium bilirubinate stones are common in patients with a history of gastrectomy, and the incidence of bile infection in the gallbladder is consequently high. For patients with bile contamination or those who have undergone intestinal adhesiolysis, an information drain is left in place. After completion of the procedure a drain was inserted in all patients, to detect potential organ injury. Drain was removed after 1 day, if content was not turbid with bile or blood.

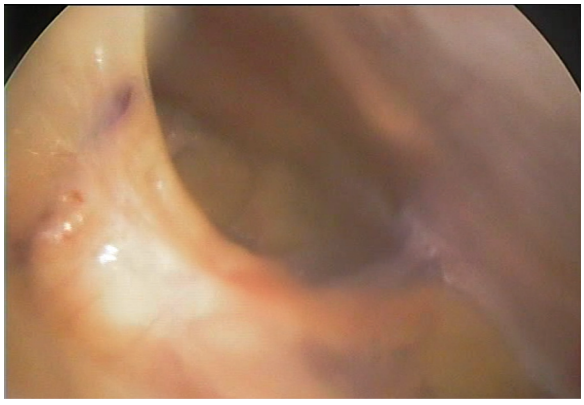
Intraoperative data regarding duration of surgery, intraoperative blood loss, number of ports, gallbladder perforation, abdominal drainage, and conversion to laparotomy were prospectively collected. Postoperative data including the length of hospital stay, abdominal pain using visual analog pain scale ranging from no pain (score 0) to worst possible pain (score 100); nausea and/or vomiting were assessed. Any incidental intraoperative and postoperative events were also recorded.

Figure 1



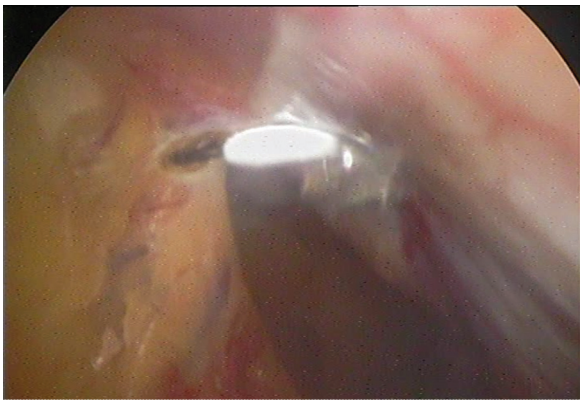
Adhesions of the omentum with the anterior abdominal wall.

Figure 2



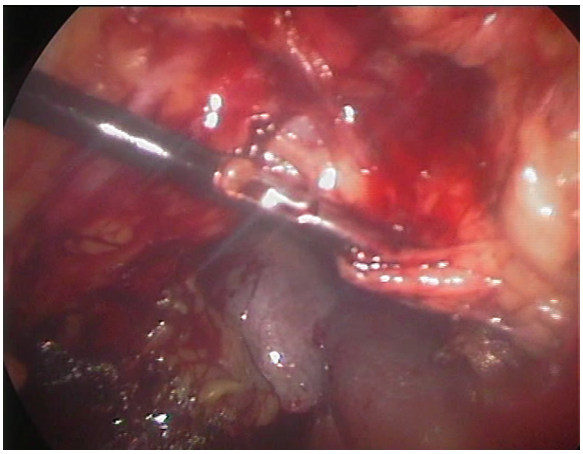
Adhesions of the transverse colon with the anterior abdominal wall.

Figure 3



Adhesions to the anterior abdominal wall.

Figure 4



Deformed gastroduodenal area.

Statistical analysis

Data are presented as means±SD. Differences between the two groups were evaluated by unpaired *t* test, and differences between multiple groups were evaluated by *t* test with correction for multiple comparisons after preliminary analysis of variance had detected statistically significant differences. Qualitative data were evaluated by Fisher's exact test. Differences were considered statistically significant when the *P* value was less than 0.05.

Results

Patient preoperative data showed a total of 50 patients (22 men/28 women; mean age 37±5.32 years; range, 46–28 years) underwent LC. The mean BMI was 25.2 (range, 16.5–33.5). There were 38 patients with midline exploratory incision, four with left subcostal incision, three with right paramedian, and five with transverse incision. There were 48 cases of cholelithiasis with chronic cholecystitis, including 21 cases with previous acute attack. There were two cases of gallbladder polyps with chronic cholecystitis. Adhesiolysis was not required in all cases, only 22 patients required adhesiolysis. Sometimes patients with a history of UAS required a larger number of trocars (more than four occurred in six patients).

The operative details were the following: all procedures were performed through four ports changing in position according to the accessibility and sometimes using the lateral approach, operative time 44.2 ±14.6 min, estimated blood loss19.3±20 ml, hospital stay 2.1±0.9 days. All patients started to eat the next day of operation, and the drain was removed before discharge.

The pain score (visual analog pain scale) on the operation day was 3.8±2.0 which decreased to 1.9 ±2.0 the following day of the operation. Analgesic dosage required was high in the first operation day where the mean number of NSAID injections were 3 ± 0.8 which decreased to 1±0.6. No operative complications attributable to adhesiolysis occurred in any case in this study group. However, 12 patients had postoperative complications: wound infection (*n*=3, 6%), umbilical hernia (*n*=1, 2%), paralytic ileus (*n*=8, 16%), and hemorrhage (*n*=0, 0%). There was no recorded mortality in this study group.

Conversion to open surgery was required in six of the 50 cases. All of the conversions were directly attributable to adhesions especially the dense adhesion in Calot's triangle.

Our study showed that three of the converted patients with UAS (supraumbilical midline incision) had had a previous gastrectomy, where the transverse colon was directly attached to the abdominal wall and there was deformation of the anatomy of the gastroduodenal area, which increase the difficulty and risk of LC. Conversion to open surgery was started immediately without any trial of adhesiolysis. In other patients conversion to an open procedure was performed because of failed pneumoperitoneum and dense adhesions.

Discussion

In patients with previous UAS, it may be assumed that inserting a laparoscope will be difficult because of adhesions [7]. However, we were able to insert a laparoscope in all of our patients by an open method via a trocar placed to the right or lower edge of the umbilicus. The impact of previous UAS on LC has been well studied and in most studies, the presence of

previous surgery did not increase the duration of surgery, complications rate, conversion rate, or hospital stay [8]. In the present study, there were no significant differences in hospital stay or complication incidence compared with other studies. Our study showed that patients with a history of UAS may require more number of trocars with a longer operation time for adhesiolysis and increased open conversion rate .These outcomes are supported by other studies. Patients with a history of UAS may have adhesions around the abdominal wall, the Calot's triangle, and its surrounding organs, and not all required adhesiolysis. Adhesions accounted for 28.2% of the conversions. Significantly more of the patients who required conversion because of adhesions had earlier undergone gastrectomy surgery. Kumar [9] recommended a subxiphoid approach because adhesions here primarily involve the liver, and intestinal adhesions are not usually present at this site. When extensive intra-abdominal adhesions are suspected or present in patients with a previous gastrectomy, safe peritoneal access is needed and blind Veress needle puncture or a trocar access at the umbilicus is contraindicated, and open laparoscopy is the most recommended method in these patients [10]. Once safe access has been achieved, the priorities of the laparoscopic surgeon change. The main goal is to perform an adhesiolysis sufficient for insertion of a second cannula to aid in visualization, retraction, and dissection, as well as for the planned and flexible use of additional ports. The laparoscope then can be moved to different port sites without the need to perform a total adhesiolysis of all visible adhesions. Only the adhesions interfering with adequate access to the operative field and the performance of the procedure will need to be dissected .Controversy still exists regarding, drain insertion, but in this study, drains were inserted in 100% of patients to detect bowel injury. UAS may increase the duration of drain and poses difficulty for LC, but this is limited to the surgery and not patient recovery. Assuming that the type of prior UAS may have different effects on the outcome of LC, and that it may cause adhesions altering the gastroduodenal area makes dissection more difficult and challenging during LC which increases open conversion rates and postoperative complications. Regardless of the type of prior UAS, severity of adhesions has more influence on the difficulty and length of the surgery [11,12].

Conclusion

In conclusion, previous UAS is not a contraindication to safe LC, but it is associated with an increased need for adhesiolysis, a longer operative time, and an increased open conversion rate. However technically demanding, it is the therapeutic procedure of choice for gallstone disease in patients with a history of previous UAS.

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Nil.

Conflicts of interest

There are no conflicts of interest.

References

1 Miller K, Ho Ibling N, Hutter J, Junger W, Moritz E, Speil T. Laparoscopic cholecystectomy for patients who have had previous abdominal surgery. Surg Endosc 1993; 7:400.

2 Tsimoyiannis EC, Tsimogiannis KE, Pappas-Gogos G, Farantos C, Benetatos N, Mavridou P, Manataki A. Different pain scores in single transumbilical incision laparoscopic cholecystectomy versus classic laparoscopic cholecystectomy: a randomized controlled trial. Surg Endosc 2010; 24:1842–1848.

3 Akyurek N, Salman B, Irkorucu O, Tascilar O, Yuksel O, Sare M. Laparoscopic cholecystectomy in patients with previous abdominal surgery. JCLS 2005; 9:178–183.

4 Diez J, Delbene R, Ferreres A. The feasibility of laparoscopic cholecystectomy in patients with previous abdominal surgery. HPB Surg 1998; 10:353–356.

5 Bae YS, Lee SM, Kim JH, Kim BS, Joo SH. Laparoscopic cholecystectomy in patients with a history of upper abdominal surgery. J Korean Soc Endosc Laparoscopic Surg 2009; 12:108–112.

6 Karayiannakis AJ, Polychronidis A, Perente S, Botaitis S, Simopoulos C. Laparoscopic cholecystectomy in patients with previous upper or lower abdominal surgery. Surg Endosc 2004; 18:97–101.

7 Yu SC, Chen SC, Wang SM, Wei TC. Is previous abdominal surgery a contraindication to laparoscopic cholecystectomy? J Laparoendosc Surg 1994; 4:31–35.

8 Kim J, Cho JN, Joo SH, Kim BS, Lee SM. Multivariable analysis of cholecystectomy after gastrectomy: laparoscopy is a feasible initial approach even in the presence of common bile duct stones or acute cholecystitis. World J Surg 2012; 36;638–644.

9 Kumar SS. Laparoscopic cholecystectomy in the densely scarred abdomen. Am Surg 1998; 64:1094–1096.

10 Sasaki A, Nakajima J, Nitta H, Obuchi T, Baba S, Wakabayashi G. Laparoscopic cholecystectomy in patients with a history of gastrectomy. Surg Today 2008; 38:790–794.

11 Schirmer BD, Dix J, Schmieg RE, Aguilar M, Urch S. The impact of previous abdominal surgery on outcome following laparoscopic cholecystectomy. Surg Endosc 1995; 9:1085–1089.

12 Goldstein SL, Matthews BD, Sing RF, Kercher KW, Heniford BT. Lateral approach to laparoscopic cholecystectomy in the previously operated abdomen. J Laparoendosc Adv Surg Tech A 2001; 11:183–186.