

The clinical outcome of traditional laparoscopic cholecystectomy

Geleneksel laparoskopik kolesistektomi klinik sonuçlarımız

Kazım Duman¹, Koray Halil Sezer², Fahri Yılmaz³, Mehmet Levhi Akın⁴

¹Gümüşsuyu Military Hospital, Department of General Surgery, İstanbul

²Balıkesir Military Hospital, Department of General Surgery, Balıkesir

³Gölcük Military Hospital, Department of General Surgery, Kocaeli,

⁴GATA, Haydarpaşa Training Hospital, Department of General Surgery, İstanbul

Abstract

Laparoscopic cholecystectomy is a safety, efficacy, established method for the treatment of symptomatic gallstone disease. We aim to share traditional laparoscopic cholecystectomy experience and complications that treated with experienced surgeons in low-volume hospitals. This study was performed during the period of 2009-2011 in three hospital. We analyzed retrospectively 266 patients, who were operated elective by three surgeon whose experiences were closely. We compared demographic data, patients age, gender, number of ports, operation time, length of hospital stay, whether or not previous abdominal surgery, whether or not systemic disease, whether or not has been performed ERCP, reason of converted from laparoscopic to open cholecystectomy and complications. 266 [165 (%72,6) female and 101 (%27,4) male] patients evaluated retrospectively. The average age was 42,6 (range 27-42). The average duration of operation was 45 minutes (range 35-72). The operation was performed by using four ports in 195 (73,3%) patients and by using three ports in 71 (26,7%) patients. 25 (9,4%) patients had intra-abdominal drainage. ERCP was performed preoperatively in 5 (9,4%) patients. We convert open cholecystectomy in 6 (2,3%) patients, due to bleeding, in 4 patients (1,5%) due to anatomical mismatch, 3 patients (1,1%) due to adhesions and difficult technical conditions. Laparoscopic cholecystectomy can be performed seamlessly with appropriate patient selection in low-volume hospitals, We believe that multidisciplinary approach was a priority in case with complications, it will be useful in terms of patient morbidity and mortality.

Keywords: Cholecystectomy; laparoscopic; clinical outcome.

Özet

Morbiditesi %0,1 lere kadar indirilen, düşük volümlü hastanelerde uygulanabilen, ciddi komplikasyonları ancak tecrübeli cerrahlarca tedavi edilen geleneksel LK tecrübelerimizi, komplikasyonlarımızı, ne seviyede olduğumuzu görmeyi ve paylaşmayı amaçladık. Ocak 2008- Haziran 2011 tarihleri arasında 3 ayrı merkezde, 3 ayrı laparoskopik tecrübeleri birbirine yakın cerrah tarafından elektif şartlarda yapılan Laparoskopik Kolesistektomi olgularının pre-intra-post operatif bulgularına ulaşarak, demografik verileri, operasyon endikasyonları, operasyon şekli (port sayısı, süresi), daha önce operasyon geçirip geçirmediği, Sistemik bir hastalığı olup olmadığı, hastanede yatma süreleri, açığa dönüş sebepleri, ERCP yapılıp yapılmadığı, görülen komplikasyonlar retrospektif olarak incelendi. 165 (%72,6) i kadın, 101 (%27,4) i erkek 266 hasta dosyası retrospektif olarak incelendi. Yaş ortalaması 42,6 yıl (range:24-72) idi. Ortalama operasyon süresi 45 dakika (range:30-75) bulundu. 71 (%26,7) hastada 3 port, 195 (%73,3) hasta 4 port kullanılarak operasyon gerçekleştirildi. 25 (%9,4) hastaya batın içi dren kondu. 5 (%9,4) hastaya preoperatif olarak ERCP yapılmış, 6 (%2,3) hasta daha önce üst batın, 31(%11,7) hasta da alt batın operasyonu geçirmiş olduğu bulundu. 6 (%2,3) hastada kanama, 4 hastada (%1,5) anatominin ortaya konamaması (anatomik uyumsuzluk), 3 hastada (%1,1) yapışıklık ve zor teknik şartlar sebebiyle açık kolesistektomiye dönüldü. Gerekli hasta seçimi ile sorunsuz olarak, düşük volümlü hastanelerde laparoskopik kolesistektomi işlemi gerçekleştirilebilir. Komplikasyon durumunda multidisipliner yaklaşımın ön planda tutulması, hasta morbidite ve mortalitesi açısından daha faydalı olacağı kanaatindeyiz.

Anahtar kelimeler: Klinik sonuçlar; kolesistektomi; laparoskopik.

Introduction

Laparoscopic cholecystectomy (LC) has now replaced open cholecystectomy as the first choice of treatment for gallstones and inflammation of the gallbladder. It was made for the first time in 1987 by Muret. Despite many modified methods (NOTES, SILS) development or implementation of the procedure, LC is still the gold standard for symptomatic gallbladder disease (1). It is preferred by surgeons because of less post-operative pain, quicker healing, improved cosmetic results, fewer complications such as infection and adhesions, short operating time and low learning curve (2). And, it is superior to other developed techniques because of economic advantage (2). Currently there are two methods of this procedure that defined as French and American form. It is made safely in low volume

hospitals by port 3 or 4 with different forms of the incision (3). One of the major and uncommon but potentially serious complication is injury to bile duct that is observed 0.3-0.6% (4). The other complications such as major vascular injuries, clips migrations and leaks, cautery injuries are observed more frequently than open procedures (5). Gallstones are eventuated to acute cholecystitis in 15- 20 % of patient (6).

Gallbladder wall ischemia and eudema occur as a result of chronic obstruction of the cystic duct and after gallbladder inflammation and fibrosis occur, gallbladder get infected. Intestinal bacteria is responsible 20- 40 % of this infection (7). Emergency cholecystectomy performed 20 % of patients with acute cholecystitis. This is caused to increase the length of hospital stay and complication rates (8). Acute cholecystitis was contraindicated in laparoscopic cholecystectomy in early

İletişim/Correspondence to: Kazım Duman, Gümüşsuyu Military Hospital, Department of General Surgery, İstanbul, TURKEY

Tel: + 90 212 251 8500 drkduman@gmail.com

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years of laparoscopic surgery, but today it is performed laparoscopically in these cases (9).

Approximately 3- 30 % of patients with symptomatic cholelithiasis have common bile duct stones (10). 60 % of cases with common bile duct stone have larger than 5 mm stones. This may lead to serious complications such as pancreatitis and cholangitis. If there are gallstones in the gallbladder, biliary tract should be examined. If there are stones in biliary tract, it should be treated (11). Today, endoscopic retrograde-colangio-pancreatography (ERCP) is used as the most common method for diagnosis and treatment (12).

The aim of this study is to share our experience and our complications of LC, that morbidity downloaded to almost 0.1 %, is applied in low volume hospitals but serious complications of LC can be treated by experienced surgeons.

Material and Methods

This study performed during the period of 2009- 2011 in three hospitals. We analyzed retrospectively 266 patients, who were operated elective by three surgeons whose experiences were closely. We compared demographic data, patients age, gender, number of ports, operation time, length of hospital stay, whether or not previous abdominal surgery, whether or not systemic disease, whether or not has been performed ERCP, reason of converted from laparoscopic to open cholecystectomy and complications.

American Society of Anesthesiologist's Category (ASA) 1, 2 groups were included. 5 % of patients were operated on emergency. Preoperative ERCP or magnetic resonance cholangiopancreatography (MRCP) was performed 4 % of patients who had preoperative alkaline phosphatase (ALP) >250 U/L , serum amylase >150 U/L, total bilirubin >2.5mg/dl and had detected dilation of common bile duct more than 8 mm or stones in common bile duct. The patients who had not possible to conduct preoperative ERCP were excluded from the study and were referred for further evaluation and treatment to an upper hospital. The patients who had postoperative choledocholithiasis were excluded from the study.

Right upper quadrant abdominal pain, leukocytosis (>11,000 /mm³), fever (>38 ° C) and increases the thickness of gallbladder wall were defined as acute cholecystitis. This patients were conservative medically treated and after performed surgery.

Systemic diseases, such as diabetes mellitus, hypertension, obesity, cardiac problems, and chronic obstructive pulmonary disease are important reasons of converting from laparoscopic to open cholecystectomy, because they lead to the prolonged operation time and anesthetic problems. Abdominal operations are classified as the lower abdomen and upper abdomen.

Over the age of 40 had preoperative routine ECG in conjunction with antibiotics and heparin prophylaxis.

Routine in all patients bleeding-coagulation times, liver function tests, ALP, GGT, bilirubin level were examined.

Pneumoperitoneum was induced using a Hasson or Veress needle technique. Pneumoperitoneum consists of carbondioxide instilled into the abdominal cavity at a set pressure 12 mmHg. First access was obtained through the infraumbilical route utilizing a 10 mm trocar. In some patients who had previously upper abdominal operation, access was obtained through the subxiphoid route utilizing a 10 mm trocar, because of adhesions for safety reasons. The laparoscopic camera was placed through this port. A second 10 mm trocar was placed under direct vision. One or two accessory trocar was placed in a right subcostal position. The patient was placed head up (reverse Trendelenburg) position and rotated 25 degrees to the left. Callot triangle was found, closure of the cystic duct and artery was usually made by clips. Retrograde cholecystectomy was then performed by using a monopolar electrocautery. The gallbladder was extracted through the 10 mm port with an endoscopic retrieval bag. Drain used when necessary.

Results

266 patients (165 female, 101 male) data were examined retrospectively. Mean age was 42.6 (range: 24-72). Hypertension in 46 patients, diabetes mellitus in 38 patients, heart failure in 5 patients, obesity, hypercholesterolemia in patients and chronic obstructive pulmonary disease in were recovered. Indications of surgery shown in Table 1.

Table 1. Indication of surgery.

Indication	Patients (n)	Percent (%)
Acute colecystitis	21	7.5
Chronic cholecystitis	23	8.5
Symptomatic cholelithiasis	172	65
Asymptomatic cholelithiasis	26	9.5
Gallbladder polyp	24	9.5

The average operation duration was 45 minutes (range: 30-75). We performed operation by using 3 ports in 71 (26.7 %) patients and by 4 port in 195 (73.3 %) patients. Intra-abdominal drain was placed in 25 (9.4 %) patients. ERCP was performed preoperatively in 5 (9.4 %) patients, and 6 (2.3 %) patients had the upper abdomen surgery, 31 (11.7 %) patients had a lower abdominal surgery. We convert to open cholecystectomy in 6 (2.3 %) patients, due to bleeding, in 4 patients (1.5 %) due to anatomical mismatch, 3 patients (1.1 %) due to adhesions and difficult technical conditions (Table 2).

Table 2. The reasons of for switching open cholecystectomy.

Complaints	The number of cases (n)	Percentage (%)
Bleeding	6	2.3
Anatomical mismatch	4	1.5
Adhesions	3	1.1

Two patients with bleeding and one patient with stump complaint were reoperated. Two patients had right upper quadrant pain and hematocrit values dropped postoperatively. Laparotomy was performed in these two patients on postoperative first day. The cystic artery stump leakage was detected and the control of bleeding was performed by suture.

One patient admitted with complaints of right upper quadrant pain, nausea and vomiting after one year of operation. Gallstone was detected on stump and the bed of the gallbladder. He underwent excision of the stump by laparoscopic exploration. Subcapsular hematoma of the liver was detected by abdominal CT in one patient. Resolution occurred with conservative treatment. Abdominal wall port site bleeding was observed in another patient and local anesthesia was applied to control bleeding (Table 3).

Table 3. The complications of operation.

Complications	The number of cases (n)	Percentage (%)
Bleeding	4	0.15
Bile leakage	2	0.75
Wound infections	2	0.75
Hernia	2	0.75
Reoperation	3	0.1

ERCP was performed preoperatively in 25 patients (9.4 %), in another center, then they underwent operation. One patient with common bile duct stones also were referred for further evaluation and treatment in a specialized center one month after the operation. Major bile leakage, a duct injury that requires laparotomy and total laceration were not observed in our cases. In two patients, 180 ml / 24 hours of drainage of bile leakage was observed. Drainage of bile leakage was reduced and improved with follow-up and conservative treatment. Wound infection of subxiphoid port region was detected in 2 patients. They were treated with appropriate antibiotics and drainage. There was no complications such as spilled gallstones. Incisional umbilical port site hernia was detected in 2 patients within 1 year of post-operative. Incisional hernia repair was performed electively. In our patients, intraoperative and / or postoperative death did not occur. The average number of days of hospital stay was 3 days (range: 2-11).

Discussion

Surgeons are divided into three groups according to their experience in laparoscopic surgery; group 1 (performed fewer than 100 LC and treated gallbladder polyp, cholelithiasis), group 2 (performed more than 100 LC and treated acute, ganrenous, atrophic cholecystitis) groups 3 (can treat the patients who has obstructive jaundice, pancreatitis) (13). We were in the second group.

Biliary injuries continue to be a significant problem following LC. Bile duct injury has been classified into 4 types. Another classification is low and high grade, depending when the leaks were identified during

contrast injecton (14). Bile leaks rate is 0.3- 1.35 %. It was recorded 0.75 % in our study. It is frequently managed nonoperatively (15). The intraoperative detection of bile leak is around 40 %. Bile duct injury resulted from failure to define the anatomy of Calot's triangle (16). Bile duct injury occur with surgeons who are experienced and inexperienced with LC than is reported (17,18). Further examination should be done immediately for what more than 3 days. Endoscopic interventions have essentially replaced surgery as first-line treatment for most of the biliary injuries following LC (19, 20). In our study we had no major bile duct injuries, required ERCP, biliary stenting, nasobiliary drain and surgery.

Operative bleeding is rather with blindly clips and cautery applications. In a study by Shea et al, 163 of 15600 cases had converted to cholecystectomy for bleeding (18). There were two deaths as bleeding. This is important in patients with cirrhosis (21). Vascular injuries are observed 0.1- 0.6 % in all patients. They included intra-abdominal, retro-peritoneal and abdominal wall bleeding (22). Major vascular injuries are 0.03- 0.006. % (23). Major vascular injuries are most frequent cause of death after complication related to anesthesia in laparoscopic surgery (24). It is suggested that epigastric vein injury and hematoma of the rectus. One of our patients had bleeding on infraumbilical ports. Hepatic and intestinal injuries can be seen in addition to vascular injury with Hasson or Veress needle technique. Intestinal or hepatic injury was usually observed in any our patients (25). The most common small bowel after duodenum and stomach are injured (26). This complication is observed 0.06- 0.35 % after laparoscopic cholecystectomy. There can cause severe complications such as sepsis, peritonitis or enterocutan fistula, because diagnosis can be late (27). This complication can be seen after cautery injury (5). Although there is less complication in the open insufflation technique, Hasson technique, developed in 1974, where at all reported six intestinal injury with Hasson technique, we did not have this complication our 53 patients with Hasson technique (27).

The rate of converted from laparoscopic to open cholecystectomy is between 3.6- 13.9 % in the literature (28). The most important reasons for converting from laparoscopic to open cholecystectomy are surgeon experience, inflammation, dense adhesions and fibrosis in Callot triangle, advanced age, comorbidity, male gender, previous upper abdominal surgery, atrophic cholecystitis, and anatomic variations (2, 13, 14, 29, 30). Acute cholecystitis was the most important reason of conversion from laparoscopic to open cholecystectomy, but today it is performed laparoscopically (31). In our study, the important reason for converting from laparoscopic to open cholecystectomy was bleeding. It was followed by anatomic variations and adhesions. Only two cases of the patients with diabetes mellitus, hypertension and seven cases of the patient with acute cholecystitis had converted from laparoscopic to open cholecystectomy. This result was statistically significant

between acute cholecystitis and converted cholecystectomy.

The rate of port area hernia was as 0.1 % in the literature (32). It is difficult to examine because of long-term follow-up. Two cases of ours had port area hernia on infraumbilical area. The patients whose port hernia repaired with local anesthesia did not have a problem.

Only one of 71 patients with 3 ports was converted from laparoscopic to open cholecystectomy for bleeding on liver bed. The rate of converting from laparoscopic to open cholecystectomy for bleeding in three ports LC is reported as 3.3 % (33). It can be seen in the literature that biliary injuries were more in three ports LC (34). It was lower in our study results, because three ports LC was performed only proper patient selection. In our opinion, more patients and large center studies are needed.

Gallbladder perforation seen an average 20 % and after stone fall into the abdomen. 9 % of this loss can be taken out only 60 % (35). This stone can cause intra-abdominal abscess, ovarian and tubal adhesions, dyspareunia and intra-abdominal fistula. Port-site abscess is caused by 14 %. Many complications can be seen in the literature after LC. These major complications increase mortality and morbidity. These complications can be treated in large centers where multidisciplinary approach is possible. These complications were not found in our patients.

Laparoscopic cholecystectomy with proper patient selection can be made safely in low volume hospital, however when there is complication, a multidisciplinary approach should be performed in a high-volume hospital since it would be useful in terms of mortality and morbidity.

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