

Laparoscopic Cholecystectomy: Preliminary Report of 26 Cases By Reviewing Literature

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✓ Son yıllarda laparoskopik kolesistektomi, bilyer cerrahide yeğlenen tedavi yöntemi olmuştur. Morbidite ve mortalite oranları konvensiyonel cerrahi kadardır. Açık girişime dönme gerekliliği, bilyer ve gastrointestinal sistem yaralamaları, kontrol edilemeyen kanamalar, subhepatik kolleksiyon ciddi komplikasyonları oluşturur. Bu yazıda, kliniğimizde laparoskopik kolesistektomi yöntemiyle tedavi edilmiş 26 vaka sunuldu. Safra yolları anomalisi olan bir ve akut kolesistite bağlı olarak Calot üçgeninde disseksiyon güçlüğü saptanan üç hastada açık kolesistektomiye dönüldü. Anomalisi olan hastada safra yolları yaralanması saptandı. Postoperatif morbidite %4.54 bulundu. Konu ile ilgili literatür gözden geçirildi.

Anahtar Kelimeler: Kolelitiazis, Akut Kolesistit, Laparoskopik Kolesistektomi

✓ Current reports show that laparoscopic cholecystectomy is the method of choice for gallbladder diseases. Morbidity and mortality rates are comparable with open cholecystectomy. Serious complications are conversion from laparoscopic cholecystectomy to open procedure, injuries of biliary duct or gastrointestinal tract, uncontrolled bleeding, and subhepatic collections. In this report, 26 cases treated laparoscopically in our clinic, are presented. Conversion from laparoscopic cholecystectomy to open procedure was performed in 4 patients. In the first case, conversion was carried out because of an extrahepatic biliary anomaly. Choledochal injury was confirmed and treated by choledochojejunostomy. In the other cases, difficulties in the dissection of Calot's triangle was the cause of conversion. Postoperative morbidity was 4.54%. Relevant literature is reviewed.

Key words: Cholelithiasis, Acute Cholecystitis, Laparoscopic Cholecystectomy

Since 1882 when Langenbuch revolutionized biliary tract surgery by performing the first cholecystectomy, it has been the method of choice for the treatment of gallbladder disease. Due to surgical trauma and limitations in the social and economic activities after coeliostomy, minimal invasive procedures have been investigated. Therefore, laparoscopic cholecystectomy has commonly been popular for years.

Laparoscopic cholecystectomy was first performed in 1987 in Lyon/France by Mauret. In 1989, Reddick^(1,2) and Dubois⁽³⁾ reported their clinical experiences in USA and France. In our country, Göney⁽⁴⁾ performed first laparoscopic cholecystectomy in September 1990 and reported 100 cases in

1992.

In this report, 26 cases of cholelithiasis, treated laparoscopically in our clinic are presented and relevant literature is reviewed.

MATERIALS AND METHODS

In this report, 26 patients, operated laparoscopically between November 1993-September 1994 for cholelithiasis or acute cholecystitis in the Department of General Surgery, Medical School of Ondokuzmayıs University, are presented. In 4 (15.38%) patients, one with biliary duct anomaly and the others with acute cholecystitis, the laparoscopic procedure had to be converted to open cholecystectomy. The first case had a

short ductus cysticus and a thin calibered choledochus and choledochal injury was confirmed. Open cholecystectomy and choledochojunostomy was performed. In the other cases, difficulties in dissection of Calot's triangle due to acute cholecystitis was the cause of conversion. These cases are excluded from this study. Gallbladder specimens were pathologically evaluated by rutin methods.

All patients were evaluated prospectively. The records were reviewed for age-sex distribution, roentgenologic - ultrasonographic diagnosis, operative and histopathological findings, coincidental diseases, surgical procedures, complications, and morbidity rates.

RESULTS

There were 6 male (27.27%) and 16 female (72.72%) patients. Mean age was 51.81 years (range 29-78 years).

Multiple and solitary gallstones were diagnosed in 13 and 9 cases respectively by ultrasonography and oral/intravenous cholecystocholangiography.

Intraoperatively acute cholecystitis was diagnosed in 3 cases. Chronic cholelithiasis was diagnosed in 19 cases.

Under intratracheal general anesthesia classic laparoscopic cholecystectomy was performed in 21 cases by inserting 4 trocars into the abdominal cavity. In one case, a 10 mm trocar was used as 5th. In a female patient with an umbilical hernia, primary repair was done at the end of the laparoscopic operation. In another female patient an ovarian cyst was diagnosed and extirpated laparoscopically. In 11 patients (50%), drainage of subhepatic region was carried out for 24-120 hours. Operating times were 40'-135' (average 85.9'). Single-dose antibiotic prophylaxis was done in 5

patients. In 16 patients, perioperative antibiotic prophylaxis was done for 3 days. In only one patient (4.54%) antibiotherapy was carried out for 6 days because of biliary drainage for 5 days. Ceftriaxone was the antibiotic of choice.

Histopathological research showed chronic cholecystitis in 18 patients, chronic cholecystitis+cholesterolosis in 1 patient, chronic active cholecystitis in 2 patients and acute phlegmonous cholecystitis in 1 patient.

Mean hospital length of stay was 1-8 days (average 3.31 days).

DISCUSSION

Minor surgical trauma, reduced hospital stay and postoperative activity loss are advantages of laparoscopic cholecystectomy in biliary surgery. In the initial cases, operating times are longer than conventional surgery. This problem disappears spontaneously by the time and experience. As a matter of fact all the reports show that operating times are 36'-135' in initial cases but comparable to open cholecystectomy later⁽¹⁻¹⁰⁾.

The rate of conversion from laparoscopic cholecystectomy to open procedure is 0.08-27%^(3,4,10-14). The rate is effected by two main events. The first is insufficiency in Calot's triangle's dissection and technical complications diagnosed intraoperatively. The second is laparotomy performed for complications (uncontrolled bleeding, subhepatic collection etc.) or overlooked choledochal stones in the postoperative period.

Risk factors, effect on conversion from laparoscopic cholecystectomy to open procedure and morbidity are shown in table 1.

In large series the main cause of conversion to conventional cholecystectomy is the difficulty of dissection of Calot's triangle

Table-1: Risk factors in laparoscopic cholecystectomy

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1. Experience of the surgical team,
 2. Congenital anomaly,
 3. Uncontrolled bleeding,
 4. Acute cholecystitis,
 5. Failure in dissection of Calot's triangle,
 6. Insufficiency in insufflation of CO₂,
 7. Injuries: *Electrocautery or laser dissection,
*Trochar or Veress needle insertion.
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due to acute cholecystitis. Zucker^(7,8) reported that the ratio of conversion was 5% in elective procedures and 27% in acute cholecystitis. Rubio⁽⁹⁾ and Spaw⁽¹¹⁾ in their elective clinic series of 500 patients, report conversion rates of 1.8% and 0.08% respectively and their findings support this opinion. In Orland's⁽¹²⁾ multicentric study the conversion rate was 6.92%, this ratio became 12.6% in acute cholecystitis and 4.99% in elective procedures. Modified technique used in patients with acute cholecystitis is summarised in table 2.

The complications of laparoscopic cholecystectomy can occur in early or late period. The major complications are: bile duct-intestinal injuries, bile leakage, uncontrolled bleeding, subhepatic collection. Wound infections, pulmoner-urinary tract infections, hyperemesis and severe pain are the minor complications. The technical complications of laparoscopy are hypercapnia, gas embolism, bradycardia, arhythmia, and reduced venous flow in the lower extremities (Table 3).

The incidence of bile duct injury during

Table-2: Modifications in the operative technique used in patients with acute cholecystitis⁽⁸⁾

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- * Use of additional canulas,
 - * Use of more versatil angled or side-viewing laparoscopes,
 - * Early decompression of gallbladder,
 - * Sharp/traumatic forceps (10 mm diameter) to retract the gallbladder,
 - * Meticulous dissection of the ductal and vascular structures,
 - * Routine intraoperative cholangiography,
 - * Liberal use of sutures to control the cystic duct and artery,
 - * Selective use of closed suction drainage catheters,
 - * Use of strile specimen bags to retrieve lost stones or to extracted infected tissues.
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Table-3: Complications of laparoscopic cholecystectomy

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- A. Major complications:
- Bile duct injuries,
 - Intestinal injuries,
 - Biliary leakage,
 - Uncontrolled bleeding,
 - Subhepatic collection,
- B. Minor complications:
- Wound infections,
 - Pulmoner or urinary tract infections,
 - Hyperemesis,
 - Severe pain,
- C. Complications of laparoscopic technic:
- Hypercapnia,
 - Reduced venous flow in lower extremities,
 - CO₂ embolism,
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laparoscopic cholecystectomy is approximately 2-4 times higher than open cholecystectomy (0.03-2.2%). It's primarily effected by risk factors^(9,12,14-20).

On the other hand electrocautery or laser dissection may cause biliary-intestinal injuries which, although rare, are serious complications^(11,17). It is announced that the incidence of common hepatic duct injury in laparoscopic cholecystectomy is two times higher than open procedures⁽¹⁴⁾. Another serious complication is intestinal, injury during the trochar and Veress needle insertion, this is rare but require laparotomy. Lee⁽¹⁴⁾, reported 0.16% intestinal injury rate in his study of 8856 patients from 7 centers.

Biliary fistulas develop in less than 1% of the laparoscopic cholecystectomy patients and overlooked stones of common hepatic duct, unsufficient titanium clip app-

lications to the cystic duct and leakage from liver bed or biliary tree injuries are amongst the major causes. Almost half of the biliary fistula patients have overlooked stones. Partial fistulas can be treated by conservative drainage. Recent reports offer open laparotomy and bilio-digestive procedures in the high-output fistulas and/or fistulas resulting from biliary tract injuries^(9,12,14,18-21). Subhepatic collections are serious complications necessitating secondary drainage of the peritoneum, if drainage was not done in first operation. Penrose drainage for 24-48 hours is helpful in preventing subhepatic collection in patients with minimal leakage from the liver bed.

Intra-postoperative beleding occur due to hurried manipulations, unsufficiently clipped cystic artery, or from the posterior branch of cystic artery and the liver bed, and, coeliotomy is commonly necessitated

(8,12,14,16,17). Rarely, epigastric vessel injuries due to trocar insertion into the abdomen, may result in abdominal wall hematoma, septicemia and intraabdominal bleeding⁽¹³⁾.

Wound infection is a rare complication of laparoscopic cholecystectomy and it is most commonly found at the periumbilical region. Pulmonary-urinary infections similar to conventional operations may develop. Postoperative hyperemesis and severe pain are found in about 28% and 37% of the patients. All of these minor complications can be medically treated without the requirement of invasive methods⁽⁹⁾.

Intraabdominal use of CO₂ at a 14-15 mmHg pressure may result in hypercapnia, drop in venous flow of the lower extremities, arrhythmia, bradycardia and gas embolism. These are very rare and have no clinical importance and elevated oxygen levels in anesthesia are helpful in prevention^(22,23).

In all published accounts of laparoscopic cholecystectomy, death appears to be an extremely unlikely complication with rates of 0-0.01%. These are commonly results of mistakes in diagnosis, cardiopulmonary complications or hemorrhagic shock^(9,12,14,16,20).

Hospital length of stay are shorter in laparoscopic cholecystectomy than conventional surgery. This is approximately 1-4 days in literature^(1,4,5,7,8-13,17,22). Operation for acute cholecystitis, complications and experience of surgical team are the factors that effect hospitalisation period. It's reported that in elective operations, hospital length of stay is approximately 20 hours. Reddick⁽²⁾ and Rubio⁽¹¹⁾ found that half of their laparoscopic cholecystectomies could be done as outpatients. In our study the period was 1-7 days. The length of this period

reflects the existence of patients who live far from the city. However, average hospitalisation period were 3.31 days; the patients who came from Samsun were externed earlier (average 1.6 days).

In the present study, morbidity and conversion from laparoscopic cholecystectomy to open procedures were comparable with literature.

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