

ANALYSIS OF 200 CONSECUTIVE CASES OF LAPAROSCOPIC CHOLECYSTECTOMY IN A SINGLE UNIT AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Objectives: To evaluate the results of the first 200 consecutive laparoscopic cholecystectomies by a single consultant / unit at a tertiary care hospital.

Design: Quasi-experimental

Place and Duration of Study: PNS Shifa Karachi, Pakistan from Nov 2009 to Oct 2011

Patients and Methods: In this prospective study, a consultant surgeon performed his first 200 laparoscopic cholecystectomies (LC) consecutively for symptomatic gallstones irrespective of status of gallbladder. During this period, 12 open cholecystectomies were carried out and patients with choledocholithiasis were excluded from study. Data including sex, age, indications for LC, conversion to open cholecystectomy, reasons for conversion, co-morbidity, types of complication, length of hospital stay and 30-day mortality was recorded.

Result: There were 200 patients with symptomatic gallstones who underwent laparoscopic cholecystectomy. Female to male ratio was 5.9:1. The mean age was 44.28 ± 13.38 years. Out of 200 patients 69% patients had chronic cholecystitis / biliary colic, 26.5% patients were with acute cholecystitis and 4.5% patients had diagnosis of empyema gallbladder. The mean operative time was 38.77 ± 13.73 min. Mean hospital stay was 1.2 days (range 1–6 days). Conversion rate to open surgery was 1.5%. Complications included cystic duct leakage in 0.5% patient, intraoperative bleeding in 1% patients, postoperative bleeding in 1% patients, sub hepatic biloma in 0.5% patient, port site infection in 3.5% patients, umbilical hernia in 0.5% patient and one patient presented with keloid at the umbilical port.

Conclusion: Laparoscopic cholecystectomy is a reliable and safe treatment modality for symptomatic gallstones. Both rate of conversion and complications are reduced with growing experience of surgeon in laparoscopic technique.

Keywords: Cholecystitis, Complications, Laparoscopic cholecystectomy.

INTRODUCTION

Cholelithiasis is the most common gastrointestinal illness with a prevalence rate of 11% to 36% in autopsy reports¹. Open cholecystectomy, first performed by Carl Lagenbuch in 1882, was the standard treatment for more than 100 years². Now a days there is a trend to abandon major ablative and deforming procedures and replace them with simpler and safer minimally invasive procedures. In 1985, surgeon Muhe from Germany performed the first laparoscopic cholecystectomy³ followed by Philippe Mourhet in France during 1987⁴. Laparoscopic surgery has now become the gold standard treatment for gallstones⁵. In 1992, the National Institutes of Health (NIH) Consensus

Development Conference stated that Laparoscopic cholecystectomy "provides a safe and effective treatment for most patients with cholelithiasis"⁶. Laparoscopic cholecystectomy has the advantages of less pain, smaller incisions, minimal scarring, shortened hospital stay, early return to work^{7,8} and decreased total cost⁹. Absolute contraindications for procedure are uncontrolled coagulopathy and end stage liver disease. Relative contraindications are severe obstructive pulmonary disease and congestive heart failure. Increased surgical experience and new technical innovations have extended the indications for laparoscopic cholecystectomy to patients with acute cholecystitis, gangrenous gallbladder, empyema of gallbladder, previous abdominal surgery, obesity and pregnancy. Conversion to open cholecystectomy is not a failure and is needed in about 5% of elective¹⁰ and 10% to 30% of emergent procedures. Laparoscopic

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cholecystectomy has mortality rate of 0.1%. Complications including haemorrhage, major vessel laceration, bile duct injuries, bowel perforation, bile leakage, cardiopulmonary complications, trocar site hernia and wound infection may occur in laparoscopic cholecystectomy. The aim of this study is to assess the mortality and morbidity in laparoscopic cholecystectomy by a single unit and surgeon at a tertiary care hospital.

PATIENTS AND METHODS

This quasi-experimental study consisting of first 200 consecutive laparoscopic cholecystectomies by a single consultant surgeon at a tertiary care hospital, PNS Shifa Karachi was carried out over a period of two years from November 2009 to October 2011. Patient selection for LC was based upon clinical diagnosis, findings of ultrasound examination, laboratory investigations and anaesthetist's assessment. All patients with symptomatic gallstones, acute calculous cholecystitis and empyema gallbladder were included. Laparoscopic cholecystectomy was not attempted in patients with previous upper abdominal surgery (n=2), perforated gallbladder with abscess formation (n=1) cholecystoduodenal fistula (n=1) cardiopulmonary disease (n=4) or equipment failure (n=4). Patients with choledocholithiasis were excluded from the study. All laparoscopic cholecystectomies performed by other surgeons at the centre were also excluded. Laparoscopic cholecystectomy was performed using single chip camera by Karl Storz. Pneumoperitoneum was established by closed method using Veress needle in 84% cases, or open technique in 16% cases. Energy source used was electrosurgical diathermy as no other source was available. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 17. The collected data included age, sex, diagnosis, history of previous surgery, co-morbidities, number of trocar placements, conversion to open surgery and its reasons, operative time, post operative hospital stay and complications. Follow up was done on 5th, 10th and 30th day. All the patients were asked to report to the OPD in case of any late complications after 30th day of operation.

Descriptive Statistics were used to describe the data.

RESULTS

During the study period first 200 consecutive laparoscopic cholecystectomies at the tertiary care hospital were analyzed. The age of patients ranged from 16 years to 76 years. The mean age was 44.28 ± 13.38 years. The female to male ratio was 5.9: 1. Depending upon the preoperative diagnosis and laparoscopic findings, patients had diagnosis of Chronic cholecystitis / biliary colic 69% (n=138), acute cholecystitis 26.5% (n=53), and empyema gall bladder 4.5% (n=9). Co-morbidities were diabetes mellitus 5% (n=10), hypertension 10% (n=20), ischemic heart disease 1% (n=2), hypothyroidism 0.5% (n=1) and hyperthyroidism 0.5% (n=1). Ten (5%) cases had small paraumbilical hernias in which umbilical port was placed by open technique after dealing with hernia. History of lower abdominal surgery mainly due to gynaecological problems was present in 32 (16%) female patients. One (0.5%) male patient had undergone laparotomy about 20 years ago. Pneumoperitoneum was established by closed method using Veress needle in 168 patients (84%) and open method in 32 (16%) cases. For laparoscopic cholecystectomy 4 port technique was used in 29% (n=58) and 3 port access in 69% (n=138) cases. Single incision laparoscopic cholecystectomy was performed in 2% (n=4) cases. The operating time from skin incision for insertion of Veress needle or open technique for establishing pneumoperitoneum and closure of skin wound ranged from 15 to 90 minutes mean time 38.77 ± 13.73 min. Average operation time was 36 min for chronic cholecystitis/biliary colic, 45 min for acute cholecystitis and 48 min for empyema gallbladder. Laparoscopic cholecystectomy was successfully completed in 98.5% (n=197) cases. The conversion from laparoscopic to open cholecystectomy was required in 1.5% (n=3) cases. The reasons for conversion were bleeding from cystic artery (n=1), difficulty in controlling oozing from liver bed due to improper functioning of insufflators (n=1), and hole in common hepatic duct (CHD) (n=1) during

dissection of Calot's triangle in a case of acute cholecystitis in which laparoscopic cholecystectomy was completed and T-tube was placed laparoscopically. However, operation was converted to open cholecystectomy to ascertain the type of CHD injury. Complications are given in table. There was no mortality. Mean hospital stay was 1.2 days (range 1 - 6 days).

cholecystectomy has rate of conversion to open cholecystectomy¹³ and is associated with certain incidents and complications¹⁴⁻¹⁶. The aim of this study was to assess the results of first 200 consecutive laparoscopic cholecystectomies by a single consultant surgeon. Laparoscopic cholecystectomy is commonly performed by standard four port technique¹⁸. Two or three port technique and SILS for abdominal access can be used. Three port laparoscopic

Table: Complications encountered during laparoscopic cholecystectomies

Complications	Number of complications	Treatment
a) Intraoperative Complications		
	n (%)	
1. Cystic Artery bleeding	1;0.5	Conversion to open cholecystectomy
2. Liver bed bleeding	1;0.5	Conversion to open cholecystectomy
3. CHD Injury	1;0.5	Conversion to open cholecystectomy
b) Post Operative Complications		
1. Cystic duct leakage	1;0.5	Laparotomy
2. Suspected Acute peritonitis	1;0.5	Laparotomy
3. Subhepatic Collection biloma	1;0.5	Laparotomy
4. Bleeding (omentum=1: liver bed=1)	2;1	Laparotomy
5. Umbilical port infection	7; 3.5	Local treatment
6. Hernia Trocar site	1, 0.5	Repair
7. Keloid umbilical port site	1, 0.5	Local steroid injection

DISCUSSION

Gallstones disease is one of the most common problems affecting the biliary tract for which surgical intervention is made throughout the world. Since the introduction of laparoscopic cholecystectomy by Muhe in Germany in 1985, thus procedure has become the treatment of choice for the symptomatic gallstones and is the commonest operation performed world-wide. Due to its obvious advantages including less pain, better cosmesis, a shorter length of hospital stay, early recovery, return to work and cost-effectiveness, laparoscopic cholecystectomy has been demonstrated to be a safe and effective alternative to open cholecystectomy. However, laparoscopic cholecystectomy needs a learning curve in mastering this operation¹¹⁻¹³. There has been an increase in the rate of cholecystectomies subsequent to the introduction of laparoscopic cholecystectomy. Currently, it is estimated that 80 to 90% of cholecystectomies are performed by the laparoscopic approach¹². Laparoscopic

cholecystectomy is safe and effective and reduces the need of one assistant¹⁹. In this study, the 3 port technique has been used in more than two third of cases. The procedure is more tedious and takes longer in emergent cases than in the elective cases. The operative time ranged from 15 minutes to 90 minutes with mean operation time of 38.77 ± 13.73 minutes which is quite less as compared to other studies¹⁷.

Laparoscopic cholecystectomy was prolonged by about ten minutes in case of acutely inflamed gallbladders in this study. Acute cholecystitis and empyema of gall bladder were once considered contraindications to laparoscopic cholecystectomy. With increasing laparoscopic experience, skills and better laparoscopic equipment, laparoscopic cholecystectomy has become the treatment of choice in these conditions. Several authors have reported performing LC in cases of acute inflammation with success but with a higher conversion rate than for elective LC^{20,21}. The

overall conversion rate reported varies from 2.6% to 10.3%.

In a study, Shamim *et al* has reported conversion to open cholecystectomy in 5.06% patients with chronic cholecystitis and 24.39 % patients with acute cholecystitis¹³. In this study, all the cases with gallstones irrespective of the status of the gallbladder were operated laparoscopically. Out of 200 consecutive laparoscopic cholecystectomies, 69% patients had gallstones presenting with biliary colic or chronic cholecystitis and 26.5% had a diagnosis of acute cholecystitis depending upon clinical, radiological and laparoscopic findings, 4.5% patients were diagnosed as empyema of gallbladder. In this series, only 1.5% cases were converted to open cholecystectomy although 31% patients had acutely inflamed gall bladder. Conversion rate in this study is acceptable. Incidents and complications occur in 1 to 5% patients, either due to laparoscopy itself or cholecystectomy operation. The mortality rate for laparoscopic cholecystectomy is about 0.1%. No mortality was seen in this study. Wound infection, cardiopulmonary complications and deep vein thrombosis are less frequently seen in laparoscopic surgery than in open surgery. No case of deep vein thrombosis was seen in this study. Umbilical port infection occurred in 3% patients who were treated locally.

Major complications of laparoscopic cholecystectomy include haemorrhage, bile leakage, subphrenic collection or abscess, and bile duct injury. In the current case series, complications and their incidence is given in table-1. Bleeding is a known complication of laparoscopic cholecystectomy with incidence upto 10% as reported in a different series²². Haemorrhage (2%) was the commonest complication in this study. Primary bleeding occurred in 1 % cases which required conversion to open cholecystectomy. Reactionary haemorrhage (0.5%) from divided omental adhesions due to previous scar close to umbilical port was seen in one case within 24 hours of operation. Haemoperitoneum (0.5%) was diagnosed during second postoperative week in other case due to oozing of blood from liver bed due to undiagnosed coagulopathy.

Both these cases were reoperated and recovered without any further complication. The exact incidence of bile duct injury during cholecystectomy is unknown, but data suggests that incidence is higher during laparoscopic cholecystectomy (0.1% to 0.85%) than open cholecystectomy (0.1% to 0.2%). In this series, common hepatic duct injury was seen in only one case (0.5%) which was treated by placing a T-tube laparoscopically. However, the procedure was converted to open one to ascertain the exact nature of injury. Bile leakage leading to biloma due to slippage of clip from cystic duct stump was seen in one case within 24 hrs of operation. The reason was the faulty clip applicator which was replaced by a new one. In another case, biloma required reoperation on 7th postoperative. Drainage was done by open surgery. However, no cause could be determined in this case. In the present study, all major postoperative complications including haemorrhage (1%), bile leakage (1%) and suspected acute peritonitis (0.5%) requiring reoperation occurred during first 100 consecutive laparoscopic cholecystectomies. No patient had undergone reoperation during last 100 consecutive laparoscopic cholecystectomy procedures. Laparoscopic cholecystectomy has reduced the hospital stay and being performed as outpatient procedure due to easy and less painful recovery. In this study, the average hospital stay was 1.2 days which ranged from 1 to 6 days. This indicates that all cases of gallstones either complicated or not can be treated laparoscopically and complication rate is reduced by the increased experience and skills of the surgeon.

CONCLUSION

Laparoscopic cholecystectomy should be the treatment of choice for all gallstone cases irrespective of status of gall bladder. Conversion to open cholecystectomy and complications are markedly reduced after the learning curve.

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