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EXPERIENCE OF LAPAROSCOPIC CHOLECYSTECTOMY AT SUKKUR

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ABSTRACT:

OBJECTIVE: *This study was undertaken to evaluate our institution's experience with Laparoscopic cholecystectomy as a safe and effective treatment for acute and chronic calculus cholecystitis in terms of post operative pain, operative time, rate of conversion and complications.*
STUDY DESIGN: *A prospective observational study.*
PLACE AND DURATION OF STUDY: *This study was conducted at Ghulam Muhammad Mehar Medical College and Hira Medical Centre Sukkur, during a period of last four years, from Jan 2006 to Dec 2009.*
PATIENTS AND METHODS: *It is a prospective study, including 1000 patients undergoing Laparoscopic surgery for symptomatic cholelithiasis. Patients included in the study were divided into two groups. Group I patients presented with chronic cholecystitis (700 patients), while Group II patients presented with acute gallbladder disease (300 patients). Patients with obstructive jaundice, choledocholithiasis, cholangitis, portal hypertension, and gallbladder malignancy were excluded from the study.*
RESULTS: *Among 1000 patients there are 205 (20.5%) males and 795 (79.5%) females. The mean age was 45 years. The male: female ratio was 1:4. In this study, the laparoscopic cholecystectomy was done for chronic calculus cholecystitis in 700 patients, for acute calculus cholecystitis in 282 patients and acute acalculus cholecystitis in 18 patients. The median of hospital stay were 2 and 3 days in chronic cholecystitis and acute cholecystitis respectively (mean were 1.9 versus 3.2 days) [P= 0.0005]. The median of postoperative stay were 0.83 and 1 day in chronic and acute settings respectively (means 0.82 ± 0.62 versus 1.82 ± 2.9 days) [P= 0.0005]. The open conversion was in 3 (0.428%) patients out of 700 with chronic cholecystitis, while in 5 (1.66%) out of 300 patients with acute cholecystitis. The mean operation time were 39.9 ± 18.8 and 57.8 ± 29.2 minutes in chronic and acute cholecystitis respectively (P=0.0005). Minimal complications were observed in the chronic group, while major complications like CBD injury and retained CBD stones along with postoperative biliary collections were found in the acute group. Wound infection occurred in 3.9%. No mortality found in the study.*
CONCLUSION: *Laparoscopic cholecystectomy is superior and beneficial to open cholecystectomy in terms of less postoperative pain, decreased hospital stay, early return to work and minimal complications. It is cost-effective and safe with less postoperative morbidity. So, it is a procedure of choice for gallbladder disease.*

KEYWORDS: Laparoscopic cholecystectomy, cholelithiasis, acute and chronic cholecystitis.

INTRODUCTION:

The field of minimally invasive surgery has experienced an explosive growth in the last two decades.

Over the last 15 – 20 years since the introduction of video-guided Laparoscopic surgery, majority of the surgical disorders have been successfully performed by minimal access approach and the technique has also been standardized. Moreover the outcome of minimal access surgery in terms of better cure rate and lower morbidity has made Laparoscopic surgery the primary treatment replacing the conventional surgery.

There is little doubt that Laparoscopic surgery will progress to encompass other procedures, and at present there is considerable interest in Laparoscopic repair of inguinal hernias, hiatus hernias and colorectal surgery.[1]

Cholelithiasis is a common condition and the introduction of laparoscopic cholecystectomy is an important milestone in surgical practice that heralds the development of further minimally invasive techniques.

The first laparoscopic cholecystectomy was performed by Phillip Mouret at Lyon in France in 1987. Athough Mouret has never published an account of this; the operation was rapidly adapted by Dubios & co-workers in Paris and the technique spread rapidly through France and Germany. Laparoscopic Cholecystectomy is the "gold standard" treatment for patients with symptomatic cholelithiasis. Now it has gained rapid acceptance and implementation by general surgeons all over the world.[2] Its advantages are decreased postoperative pain, hospital stay and morbidity leading to early mobilization and early return to diet and work with cosmetically small scar.

The purpose of this study was to assess the morbidity of laparoscopic cholecystectomy in our setup and highlight its safety and effectiveness; so that the patients with gallbladder disease should get benefit from this newly developed technique.

PATEINTS AND METHODS:

This is a prospective study, including 1000 non-selective patients undergoing laparoscopic cholecystectomy for acute and chronic cholecystitis at Ghulam Muhammad Mehar Medical College and Hira Medical Centre Sukkur during a period of last four years (Jan, 2006 to Dec, 2009).

All the patients with chronic calculus cholecystitis who attended the surgical out-patient department of our institution were registered and included in the study. They were admitted on the day of surgery or a day before surgery. The patients with acute cholecystitis were admitted as an emergency with severe pain in right upper abdomen. They were managed initially conservatively and early laparoscopic cholecystectomy was done within 48-72 hours of their admission or on the next available operation list. Routine investigations along with ultrasound abdomen were carried out. Nature of the procedure was explained and consent for open conversion was also taken. All patients were given single dose of prophylactic antibiotics at the time of induction of anaesthesia, followed by more doses postoperatively if required in infected cases. The operations were performed using standard four port technique. Subhepatic drains were placed for most patients with acute cholecystitis and were used for chronic cholecystitis whenever considered necessary. Patients were allowed orally liquids in the evening or night of surgery while regular diet was resumed on the next morning. A majority of patients were usually discharged 24 hours after surgery. Follow up examination was performed on seventh postoperative day.

All clinical data, investigations, operative findings, operative time, total hospital stay, open conversion rate and intra-operative as well as post-operative complications were recorded. The data was compiled and results drawn and compared with national and international literature. Statistical analysis was carried out using SPSS version 10.

Table I:

DIFFERENT CONDITIONS FOR GALLBLADDER DISEASE MANAGED LAPAROSCOPICALLY:

Conditions of gallbladder disease	No: of patients	%
Acute calculus cholecystitis	157	15.7%
Acute calculus Cholecystitis with acute pancreatitis	29	2.9%
Acute acalculus cholecystitis	18	1.8%
Empyema / mucocele	83	8.3%
Gangrenous gallbladder	13	1.3%
Chronic calculus cholecystitis	658	65.8%
Chronic calculus cholecystitis with fibrosed gallbladder	42	4.2%

Table II:

RESULTS OF TREATMENT: (AFTER EXCLUDING CONVERTED CASES)

Variable	Chronic cholecystitis (n=700)	Acute Cholecystitis (n=300)
Median hospital stay	2 (0.5 – 10)	3 (1 – 8)
Median postoperative stay	0.83 (0.16 – 4)	1 (0.29 – 6)
Operative time (minutes)	38.26 ± 16.6	49.58 ± 18.9
Open conversion	3	5
Mortality	0	0

RESULTS:

Among 1000 patients there are 205 (20.5%) males and 795 (79.5%) females. The age of patients ranged from 20 – 70 years. The mean age was 45 years. The male: female ratio was 1:4. In this study, the laparoscopic cholecystectomy was done for chronic calculus cholecystitis in 700 patients, for acute calculus cholecystitis in 282 patients and acute acalculus cholecystitis in 18 patients. Results were analysed in the study by dividing the patients into two groups. Group I included patients with chronic cholecystitis, and Group II included patients with acute cholecystitis.

The median of hospital stay were 2 and 3 days in chronic cholecystitis and acute cholecystitis respectively (mean were 1.9 versus 3.2 days) [P= 0.0005]. The median of postoperative stay were 0.83 and 1 day in chronic and acute settings respectively (means 0.82 ± 0.62 versus 1.82 ± 2.9 days) [P= 0.0005]. There was statistical significant difference in hospital stay and postoperative stay between the two groups. 520 (74.28%) patients out of 700 in chronic cholecystitis and 152 (50.66%) patients out of 300 in acute cholecystitis were discharged in less than 10 hours after surgery. The open conversion was carried out in 3 (0.428%) patients out of 700 with chronic cholecystitis, while in 5 (1.66%) out of 300 patients with acute cholecystitis. The causes of open conversion were Mirizzi Syndrome (2 patients), fibrosed gallbladder with cholecystoduodenal fistula (1 patient) in chronic group, while in acute group it included thick adhesions and difficult dissection (4 patients), and CBD injury (1 patient). The mean operation time were 39.9 ± 18.8 and 57.8 ± 29.2 minutes in chronic and acute cholecystitis respectively (P=0.0005)

Minimal complications were observed in the chronic group, while major complications

like CBD injury and retained CBD stones along with postoperative biliary collections were found in the acute group. The intraoperative and postoperative complications of both chronic and acute group are summarized in Table III. One patient with CBD injury in acute group was treated by open conversion and T-tube placement, while two patients who had missed stones were referred to tertiary hospital for ERCP. Patients with postoperative biliary collections were treated by percutaneous drainage or medical therapy and open drainage was done for one patient who developed generalized peritonitis. No mortality was found in the study. Thus open conversion rate, operative time, postoperative stay, total hospitalization and complications were statistically lower in chronic group as compared to acute group.

Table III:
(a) Intraoperative complications

Variable	Chronic group	Acute group	Reasons / management
CBD injury	0	1	Open conversion and T-tube.
Avulsion of cystic duct	2	12	Managed by suturing/ ligation/ clipping
Avulsion of cystic artery	3	16	Managed by clipping / diathermy
Bleeding from liver bed	8	35	Managed by diathermy or Argon beam spray.
Difficult dissection at callot's triangle	32	75	Done by blunt and sharp dissection with no complications
Spillage of bile and stones during procedure	38	85	Managed by picking up stones and irrigation/ suction. No late complications noted.
Gut / solid visceral injury	0	0	
(b) Postoperative complications			
Post-operative biliary collection	2	6	4 cases U/S guided drainage. 3 cases managed conservatively. Open drainage in 1 case.
Infra umbilical port infection	12	27	Application of pyodine dressing.
Port site serous discharge	23	56	Application of pyodine.
Retained CBD stones	0	2	ERCP retrieval of stones.
Post-op abdominal pain	21	59	Managed by analgesics.
Post-op jaundice	1	2	

DISCUSSION:

In today's modern world of surgery, laparoscopy has major role in many general surgical procedures. Laparoscopic surgery is superior and beneficial to open surgery. Open surgery may result in increased post-operative pain, delayed mobility, prolonged hospital stay, adhesion formation and incisional hernia.[1] On the contrary, after Laparoscopic surgery patient returns to home and work early. The benefit of minimally invasive surgery has been well demonstrated in the treatment of biliary colic, turning Laparoscopic cholecystectomy in most instances in to a truly outpatient procedure.[2] In this study, Laparoscopic cholecystectomy was done in 1000 patients successfully with minimal complications. The cases of gallstones with acute and chronic cholecystitis, acute pancreatitis, mucocele, empyema and gangrenous gall bladder were performed laparoscopically with success. More recently, there has been a move towards performing Laparoscopic cholecystectomy in the acute setting to shorten both operative time as well as length of hospitalisation. The current literature suggests early Laparoscopic cholecystectomy (within 72 hours of onset of symptoms) for acute cholecystitis. Early Laparoscopic cholecystectomy is recommended within 72 hours of onset of symptoms to decrease open conversion rates.[3] In this sub-group of patients in which Laparoscopic cholecystectomy was done successfully within 48 – 72 hours of onset of symptoms, only four cases were converted into open because of thick adhesions of omentum all around the gallbladder and difficulty in adhesiolysis. The dissection that is difficult laparoscopically is often equally difficult at open operation and conversion does not guarantee the avoidance of inadvertent biliary or vascular injury.[1]

A meta-analysis of four clinical trials involving 504 patients has suggested that early laparoscopic cholecystectomy is more cost-effective because it is associated with a reduced length of hospital stay and a lower risk of readmission with recurrent acute Cholecystitis.[4] Early laparoscopic cholecystectomy during acute cholecystitis seems safe and cost-effective by shortening the total hospital stay.[4,5]

Laparoscopy was first used for evaluation of acute abdominal pain in pregnancy in 1980 by gynaecologists. The most commonly reported laparoscopic procedure done during pregnancy is laparoscopic cholecystectomy.[6] In this study, laparoscopic cholecystectomy was done in 8 (2.66%) pregnant patients in first and second trimester with acute calculus Cholecystitis successfully without complications. Laparoscopy is feasible in an emergency setting, even for pregnant patients.[7] Though our initial experience is only limited in pregnant patients, it could be safe and efficient.

The open conversion rate in this study is 0.428% in the chronic group, while it is 1.66% in the acute group. In one of the local series it was found 12.73% in acute cholecystitis, in others 2%, 6% and 14%.[8,9] Wang et al reported the overall conversion rate 3.6% for laparoscopic cholecystectomy in acute cholecystitis[10]. Arnalson et al. reported the conversion rate of 12.2% for acute Cholecystitis.[11]

A dedicated team within hospital specializing in the management of acute gallbladder disease can lead to reduction in the conversion rate in the emergency setting as shown in a study from Portsmouth.[12,13] The conversion rate during an emergency readmission was significantly higher than the rate at first admission because of technical difficulty in dissection in late laparoscopic surgery.[14,15,16]

The mean operation time between the two groups was different significantly. In the

chronic group it is 39.9±18.8 minutes, while in the acute group it is 57.8±29.2 minutes (P = 0.0005), which is comparable to mentioned studies. Chau et al. reported the mean operation time in the patients with acute Cholecystitis was 84 minutes.[17] Eldar et al. reported the mean operation time was 60 minutes.

Total hospital stay and post operative stay in chronic group were lower than the acute group in this study as shown in table II. Chau et al. reported mean postoperative stay for patients with acute Cholecystitis was 5.6 days.[17] Eldar et al. reported the median post operative stay was 3 days in acute cholecystitis. Gharaibeh et al. reported mean post operative stay for patients with chronic cholecystitis as 1.33 days and 1.9 days in patients with acute cholecystitis.[18] The present study showed the total hospital stay and post operative stay which were less as compared to other studies.

Intraoperative and post-operative complications of laparoscopic cholecystectomy were more in acute group than the chronic group as shown in table III (a) and (b). These are comparable with other studies in the literature.[19,20]

Typical mishaps of laparoscopic surgery are reviewed according to the literature. Set-up of the pneumoperitoneum (morbidity upto 0.2%) bleeding from trocar sites and vascular injury (mortality upto 0.2%), biliary leaks and bile duct injuries (0.2% - 0.8%) are the main complications.

Vascular injuries are the most lethal technical injuries of Laparoscopic cholecystectomy with incidence ranging from 0.25%-8%. In this study, haemorrhage occurred in 77 patients (7.7%). Source was cystic artery in 19 patients (1.9%), omentum bleeding in 15 patients (1.5%), and from liver bed in 43 patients (4.3%). Cystic artery bleeding was managed by clipping/ diathermy, omental bleeding managed by diathermy/ ligation, while liver bed bleeding was managed by diathermy/ Argon beam spray/ sponge stone. Bile duct injury is one of the serious complications of Laparoscopic cholecystectomy. Its incidence is more in Laparoscopic cholecystectomy (0 – 2%) than open cholecystectomy (0 – 0.4%). In this study, only 1 case of common bile duct injury was occurred (0.2%) which was managed by open conversion and T-tube placement.

The incidence of biloma formation after Laparoscopic cholecystectomy is significantly higher than open cholecystectomy. Common causes of biliary leakage are cystic duct (due to improper clipping or thermal injury), gallbladder bed, and accessory duct or common bile duct injuries. The literature shows 0.2% to 2% in different series.[21] In the present study the postoperative biliary collection is found in only 8 (0.8%) cases.

Intraoperative non-biliary injuries (duodenal perforation, diaphragmatic injury, small bowel injury, portal vein injury, liver laceration) during Laparoscopic cholecystectomy occur as frequently as biliary injuries and can be life-threatening and difficult to manage. Bowel injuries during laparoscopy have been widely reported, caused by trocars or veress needle insertion and during dissection of abdominal or gallbladder adhesions.[8] The incidence of bowel injury is 0 – 5% in different series.[22] In this study it is zero may be because of that all trocar cannula were inserted under direct vision. Hassan's technique was used instead of veress needle.

Gallstone spillage during Laparoscopic cholecystectomy is a relatively common occurrence. These intraperitoneal gallstones are considered to be harmless. Rarely they may give rise to complications. Perforation of gallbladder does not appear to influence the outcome of Laparoscopic cholecystectomy, if irrigation and suction done thoroughly.[23] In this study spillage of bile and stones were found in 123 (12.3%) patients and managed by picking up the stones and irrigation and suction laparoscopically with no complications.

The most obvious merit of the Laparoscopic surgery is reduced postoperative pain. It also avoids pulmonary complications and postoperative hypoxia associated with upper abdominal incisions due to pain. Postoperative abdominal pain was reported in 80 (8%) patients in the present study. 90% of these patients required only a single dose of parentral analgesia, and only 10% required a second or third dose. In our study, 28 (2.8%) patients complained of postoperative shoulder tip pain due to retained CO_2 (pneumoperitoneum). It settled over 2 – 3 days by analgesics.

Recovery after Laparoscopic surgery is generally fast.[24,25] In this study simple cases (90%) usually discharged on next day of surgery, while complicated cases (10%) discharged 2 days after surgery.

CONCLUSION

Laparoscopic surgery now-a-days is superior and beneficial to conventional open surgery. It is cost effective and safe, with less postoperative morbidity associated with less postoperative pain, short hospital stay, fast recovery, early mobilization, early return to diet and work and cosmetically with very small scar. But careful selection of patients, the knowledge of typical procedure related complications and their best treatment and the proper skill and training of surgeon about laparoscopy are the key points for a safe and successful Laparoscopic surgery.

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