

FREQUENCY OF COMMON BILE DUCT INJURY IN LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Objective: The aim of the study is to review the frequency of Common Bile Duct (CBD) injury in laparoscopic cholecystectomy (LC) and its management in our set up.

Methodology: This descriptive study was conducted at Surgical Department, Rawalpindi Medical College and the author's Surgical Clinics from January 1998 to December 2012. Two thousand patients undergoing laparoscopic cholecystectomy were included in the study. The cases were operated between January 1998 and December 2012. The important variables included were frequency of CBD injury and its management.

Results: There were 1723 females and 277 males with mean age 45.04 ± 11 years. 67.8% patients had chronic cholecystitis with cholelithiasis and were admitted through Out Patient Department whereas 32.2% patients were admitted through A&E department. Abdominal ultrasound showed multiple calculi in 1535 (76.7%) patients and 435 (23.3%) patients had single calculus preoperatively. Empyema was found in 245(12.2%) cases whereas adhesions were present in 783(39.1%) patients. Conversion rate to open cholecystectomy was 3.4 %. Seventeen cases had CBD injury (0.85%). 14 cases (82.3%) were diagnosed intraoperatively whereas 3 cases (17.7%) were diagnosed postoperatively. In 13 cases (76.5%) CBD repair was done over T.tube. Mean operating time was 30 minutes.

Conclusion: The frequency of CBD injury in LC in our setup was less than 1% and is comparable to international experience. Most of the cases were diagnosed intraoperatively. Repair over T.tube is commonest method employed for management of CBD injury with favorable results.

Key words: Laparoscopic cholecystectomy, Calculous cholecystitis, Common Bile Duct (CBD) injury.

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INTRODUCTION

It is estimated that in United States of America about one million patients have gallstones. Gallstones are the most common cause of hospitalization and the most costly digestive tract disease, with an annual estimated overall cost of more than five billion US dollars¹.

The standard treatment for symptomatic gall stones was open operation through abdominal incisions to remove the gall bladder till late 80s. Open cholecystectomy needs a five day hospital stay and a 3-6 weeks period of convalescence².

Muhe performed the first laparoscopic cholecystectomy (LC) in 1985³. He presented his work to German Association of Surgeons, who initially ignored it although

by 1986, he had accumulated 94 cases of the procedure. The credit of LC goes to Mouret, a French surgeon who videotaped the operation and demonstrated the operation in videotape to surgeons in Europe and U.S.A. The first published series was by Cuschiari and Dubois in 1991⁴. Today more than 83.3% of cholecystectomies are carried out laparoscopically⁵ and LC has become standard surgical treatment of gallstone disease. It is one of most routinely performed abdominal operation by general surgeon.

The major benefit of laparoscopy in upper gastrointestinal surgery results from avoidance of an upper abdominal incision, resulting less pain and improved pulmonary function tests compared to small incision cholecystectomy⁶. Studies have shown that LC reduc-

es hospitalization and promotes earlier recovery and return to normal activity and is not associated with post-operative immunosuppression. There is more positive post-operative morbidity profile compared to open surgery⁷⁻⁹. LC is associated with low incidence of complications. However there is still concern regarding the most serious complication of procedure i.e., the iatrogenic injury of common bile duct (CBD)¹⁰⁻¹².

The incidence of CBD injury has decreased compared with earlier periods¹³. However, several studies have shown, a persistent high rate of CBD injury when LC is performed compared to open cholecystectomy (0.3% to 0.6% vs. 0.2%)^{12,14,15}.

The aim of the study was to review the frequency of CBD injury in LC and its management in our set up.

METHODOLOGY

A prospective cohort of 2000 patients undergoing laparoscopic cholecystectomy between January 1998 to December 2012 in Surgical Department, Rawalpindi Medical College and the author's surgical clinics were included in the study.

They were selected through non probability purposive sampling and were admitted through Out-patients and Accident & Emergency Department for elective laparoscopic cholecystectomy.

According to inclusion criteria, patients of any age and gender with clinical diagnosis of acute and chronic cholecystitis underwent a detailed pre operative work-up including history, physical examination, laboratory investigations, abdominal ultrasound and pre anesthetic evaluation.

We excluded the patients with history of previous upper abdominal operations, immunosuppressed, receiving radiotherapy, with evidence of common bile duct pathology on clinical, biochemical or ultrasonological basis and having bleeding disorders.

Patients with deranged liver function tests were treated first on medical basis and then underwent laparoscopic cholecystectomy.

Pre operative, intra operative and post operative variables were collected and analyzed.

Pre operative variables included age, gender, mode of admission, diagnosis, total leukocyte count and ultrasound findings with emphasis on the number of calculi.

Operative variables included operating room (OR) time, status of gall bladder, presence of adhesions, perforation of gallbladder with spillage of stones, common bile duct injury, conversion to open cholecystectomy

and the reasons behind it.

Standard four port technique was used. The camera port was inserted through infraumbilical/umbilical incision. The second 10 mm port was placed in the epigastrium, about 5 mm below the xiphoid, with its intra-abdominal entrance site being just to the right of the falciform ligaments. Two smaller ports for grasping instruments were then placed, one in right upper quadrant near the midclavicular line and second just medial to anterior axillary line.

A nasogastric tube was only passed to empty the stomach when stomach was distended obstructing the vision of sub hepatic space, and it was removed on extubation.

If there was leaking of bile in the peritoneal cavity, it was sucked up and peritoneal cavity lavage with normal saline was done at end of procedure. Similarly in case of spillage of stones, smaller stones were sucked with help of normal saline using 10mm sucker whereas large stones were individually picked up and removed one by one or a basket made up of surgical glove was used. In all cases, a drain was placed. Port site wounds were approximated with silk. If rectus sheath defect was enlarged to >10 mm for gall bladder removal it was also repaired. Third generation Cephalosporin, 1gm was injected at time of induction of anesthesia along with injection Metoclopramide 10mg and injection Diclofenac Acid 75mg. In post operative period, 02 doses of antibiotics with antiemetics and painkillers were given. Most patients were discharged on next day except cases of empyema or patients suffering from CBD injury who needed continuation of antibiotics.

RESULTS

In our study, there were 1723 (86.15%) were females and 277 (13.85%) males with female to male ratio of 6.2:1. The mean age of study participants was 45.04+11 years. Pre operative variables are given in Table 1.

The mean operating time was 30 minutes. The operating room duration, the status of gallbladder, presence of adhesions and perforation of gallbladder with spillage of stones are summarized in table 2.

In our study, 17 out of 2000 patients (.85%) had common bile duct injury. All the 17 cases were females. The age ranged from 23 year to 55 year. All were female patients. Fourteen (82.3%) cases were diagnosed intraoperatively while in 3(17.7%) cases it was detected in the post operative period and needed re-intervention. The main cause was lack of identification of anatomy in 16 (94.2%) cases whereas in one(5.8%) case, it was due to the injury caused by harmonic scalpel. Fourteen (82.3%)

Table 1: Pre operative variables (n= 2000)

Variables	n (%)
Males	277 (13.85%)
Females	1723 (86.15%)
Admitted via Out Patient Department	1356 (67.8%)
Admitted via Accident & Emergency	644 (32.2%)
Chronic cholecystitis	1356 (67.8%)
Acute cholecystitis	644 (32.2%)
Normal leukocyte count	1299 (64.9%)
Raised leukocyte count	701 (35%)
USG(single calculus)	435 (21.7%)
USG(multiple calculi)	1535 (76.7%)

Table 2: Intra operative variables (n= 2000)

Variables	n (%)
Normal gallbladder	731 (36.5%)
Moderately distended gallbladder	287 (14.3%)
Severely distended gallbladder	323 (16.1%)
Shrunken gallbladder	144 (7.2%)
Mucocele gallbladder	270 (13.5%)
Empyema gallbladder	245 (12.2%)
Adhesions	783 (39.1%)
Perforation with stone spillage	84 (4.2%)
Conversion to open cholecystectomy	68 (3.4%)
Operating room time of less than 30 min	1091 (54.5%)
Operating room time between 30 & 60 min	799 (39.9%)
Operating room time more than 60 min	110 (5.5%)

were cases of chronic cholecystitis while 3(17.7%) were cases of acute cholecystitis. Patients diagnosed intraoperatively, CBD repair using T-tube was done in 13(76.5%) cases while in one (5.8%) case, choledochoduodenostomy was done however patients who were diagnosed in postoperatively, initial drainage followed by choledochojunostomy was done.

Mean postoperative stay was 7 day. Two cases presented in follow up with STRICTURE OF CBD, and were treated by Choledochojunostomy. Both were intraoperatively diagnosed cases, one case in which choledochoduodenostomy was done, presented about 4 month after initial surgery and in second case in whom CBD was repaired over T-tube, presented after 6 year.

DISCUSSION

Ever since Philips Mouret performed first video-laparoscopic cholecystectomy in Lyons, France¹⁶, this procedure is gaining popularity day by day and has become treatment of choice for symptomatic gallstones.

The benefits of LC like shorter postoperative hospital stay, more rapid overall recovery time and better cosmesis have been well established and documented⁷⁻⁹.

LC is the commonest elective procedure done in our set up among the minimal invasive procedures of general surgery. The age range of our patients of LC is comparable to the data published in literature^{17,18}.

The female to male ratio of 6.2:1 or higher than that is reported in literature¹⁹. We admitted 67.8% patients via Out Patient department and 32.2% through Accident & Emergency while a study conducted at South Australia shows 83.1% admissions through Out Patient Department and 16.8% through Accident & Emergency²⁰.

The most feared complication of LC is CBD injury. Its frequency is still high although so many advances have been made in technique of LC. CBD injuries are directly related to surgical technique and the negative impact related to LC can be reduced through low incidence, high intraoperative diagnosis and adequate repair by trained surgeons, ensuring long term success^{21, 22}. Special teams are constituted in certain countries, trained in repair of CBD injuries who take over such patients to ensure optimal results.

CBD injury occurred in 0.85% of cases in our study though the frequency was 1.4% in first 1000 cases which later decreased to only 0.3% in subsequent 1000 cases. This complication had a comparable rate of 0.8% and 1.6% reported in two studies^{23,24} but in other two studies, it was reported to be 0.16%²⁵ and 0.35%²⁶.

The intraoperative diagnosis of BDI is a topic of great importance in the management of these patients because it allows lower morbidity and mortality rates. Serious post-operative complications, such as cholangitis, bilomas, and biliary peritonitis are avoided; all of which are determining factors for the development of sepsis, the leading cause of mortality in these patients^{15,27,28}. In our study, most of the cases of CBD injury were diagnosed intraoperatively (82.3%).

It is postulated that a different surgeon than the one injuring the bile ducts should perform the repair; a key factor in cases where the original surgeon does not have expertise in the area²⁹. However in our set up, most of the injuries were repaired by same surgeon.

The most common method employed in our study for repair of injured CBD was repair of CBD over T.tube (76.5%) as recommended³⁰. Only two cases (11.6%) came in follow up with stricture of CBD.

The advantages of the intraoperative repair approach are the following: it is performed during same anesthesia, avoids referring the patient to another institution, total hospitalization is shorter compared with delayed treatment, it generally requires a few abdominal and biliary drains and less psychological trauma for the patient. These events generate less discomfort to the patients and their family and probably less likely to make malpractice litigations³¹.

The main short coming of the study was a poor follow of CBD injury patients. Only two patients presented in follow up with stricture of CBD while outcome in remaining patients was unknown.

CONCLUSION

The frequency of CBD injury in LC in our setup was less than 1% and is comparable to international experience. Most of the cases were diagnosed intraoperatively. Repair over T.tube was commonest method employed with favorable results.

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