Original Research Article

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Study of open cholecystectomy for gallbladder disorders

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ABSTRACT

Background: Cholecystectomy is one of the most common surgeries done worldwide. Most common indication is biliary colic due to cholelithiasis. Presently most cholecystectomies are done by laparoscopic approach, however conversion to open cholecystectomy is needed in few circumstances and there are some absolute indications for open cholecystectomy where laparoscopic procedure can't be done.

Methods: This is a prospective observational study of 50 open cholecystectomies operated during March 2017 to Feb 2019 in our medical college. Various data including demographic data of patients, different indications, post-operative complications were documented and analyzed.

Results: Mean age of the patients was 40.58 (16-65) years. Female patients were more in number 32 (64%) when compared with males. Maximum patients were in the age group 31-40 years accounting to 17 (34%) of study population. Pain abdomen 24 (48%) was the chief presenting complaint. Cholelithiasis 38 (76%) was the major indication for surgery. Complications like bile leak, bleeding, subphrenic abscess and infection occurred in 04 (08%) patients. Total four cases of laparoscopic cholecystectomy were converted to open cholecystectomy. Mean hospital stay was 7.48 (5-14) days.

Conclusions: Even though laparoscopic cholecystectomy is the gold standard in the present era, it is important that the surgeon is also competent in doing open cholecystectomy. Certain conditions require planned open cholecystectomy as the standard procedure. In difficult laparoscopic cases, the surgeon must take timely decision to convert to the open technique. Surgeons experience and proper clinical judgment skills are important in difficult cases.

Keywords: Cholelithiasis, Cholecystectomy, Gallbladder

INTRODUCTION

Cholecystectomy is most common elective surgery done worldwide. In United States alone 1.2million cases are done annually. Most common indication is biliary colic due to cholelithiasis. Before 1991, open cholecystectomy was the common procedure. Presently most cholecystectomies are done by laparoscopic approach. However, conversion to open cholecystectomy is needed in few circumstances. In such scenarios open cholecystectomy skills are needed. With the advent of

laparoscopic procedures and the laparoscopic cholecystectomy in the early 1990s, the gold standard for cholecystectomy has changed to a laparoscopic approach. Today, 92% of all cholecystectomies are done laparoscopically. With the beginning of laparoscopic cholecystectomies in the 1990s, CBD injuries increased by three to ten times. The injury rate dropped to 0.3% but has remained the same despite better training of surgeons, and evolution of HD technology. Laparoscopic CBD injuries are more complex to treat when compared with CBD injuries of open cholecystectomy. Objectives of this

study is to highlight the importance of open cholecystectomy even though laparoscopic cholecystectomy is the gold standard treatment for gallbladder disorders.

METHODS

All patients admitted in the surgical wards in all the units of MNR Medical College Hospital Sangareddy, operated for open cholecystectomy were included in the study. The study was conducted after taking approval from the hospital ethical committee.

Study design and statistical methods

This is a prospective observational study consisting of 50 patients who underwent open cholecystectomy. Fifty patients were chosen randomly for observation. We studied various demographic parameters, clinical presentation, indications and complications of open cholecystectomy over a period of two years from March 2017 to February 2019. Data were compiled and results on categorical measurements were presented in number (%). Microsoft office Excel 2007 software was used to study the results in number/percentage.

Indications for cholecystectomy⁴

Are related to symptomatic gallstones or complications related to gallstones like biliary colic, cholecystitis acute/chronic, biliary pancreatitis, choledocholithiasis. Other indications are empyema gallbladder, acalculous cholecystitis, biliary dyskinesia, mucocele of gallbladder, gallbladder cancer. Prophylactic cholecystectomy is done in diabetic patients, congenital haemolytic anaemia patients and in patients who have undergone bariatric surgery.

Contraindications⁵

Severe comorbid conditions like advanced respiratory and cardiac diseases, shock, neurologic diseases, and other life-threatening conditions. Patients with coagulopathy and those on anticoagulant therapy.

Open cholecystectomy procedure⁶

Most open cholecystectomies are performed with general anaesthesia. Place a Foley's catheter and Ryle's tube before the procedure starts. Administer Vitamin-K injection IM for 3/5 days prior to surgery. Administer antibiotic intravenously just before giving skin incision. Patients are positioned supine with the arms extended. Placing a sandbag underneath the patient's right back will give good exposure to Calot's triangle. Right subcostal (Kocher's) incision is the preferred incision. Other incisions like upper midline incision, right paramedian incision and Mayo-Robson incision can be taken. Open cholecystectomy can be performed by two methods, either by duct-first method or by fundus-first method.

Either an upper midline or a short right upper transverse incision is made, centred over the lateral border of the rectus muscle. The gallbladder is appropriately exposed and packs are placed on the hepatic flexure of the colon, the duodenum and the lesser omentum to ensure a clear view of the anatomy of the porta hepatis. These packs may be retracted by the assistant's hand ('It is the left hand of the assistant that does all the work' - Moynihan). Alternatively, a stabilised ring retractor is used to keep the packs in position. An artery or Duval forceps is placed on the infundibulum of the gallbladder and the peritoneum overlying Calot's triangle is placed on a stretch. The peritoneum is then divided close to the wall of the gallbladder and the fat in the triangle of Calot carefully dissected away to expose the cystic artery and the cystic duct. The cystic duct is cleaned down to the common bile duct, whose position is clearly ascertained. The cystic artery is tied and divided. The whole of the triangle of Calot is displayed to ensure that the anatomy of the ducts is clear and the cystic duct is then divided between ligatures. The gallbladder is then dissected away from the gallbladder bed. Some golden rules to observe in case of difficulty: When the anatomy of the triangle of Calot is unclear, blind dissection should stop. Bleeding adjacent to the triangle of Calot should be controlled by pressure and not by blind clipping or clamping. When there is doubt about the anatomy, a retrograde or 'fundusfirst' cholecystectomy dissection on the gallbladder wall from the fundus to the cystic duct can be helpful. If the cystic duct is densely adherent to the common bile duct and there is the possibility of a Mirizzi syndrome (a stone ulcerating through the neck of the gallbladder into the common hepatic duct), the infundibulum of the gallbladder should be opened, the stone removed and the infundibulum oversewn. Attempts to dissect out the cystic duct completely will only lead to injury to the common hepatic or common bile duct. cholecystostomy is rarely indicated but, if required, as many stones as possible should be extracted and a large Foley catheter (14 Fr) placed in the fundus of the gallbladder with a direct track externally. By so doing, stones retained in the gallbladder can be subsequently extracted with a choledochoscope.

RESULTS

A total of 50 patients who underwent open cholecystectomy were included in the present study conducted from March 2017 to February 2019 over a period of two years at our hospital. Our study had 32 (64%) females and 18 (36%) males (Figure 1). Mean age group was 40.58 (16-65) years.

Two patients were in the <20 years age group. Nine patients were in the 21-30 years age group. Seventeen patients were in the 31-40 years age group. Ten patients each were in the 41-50 years age group as well as in the 51-60 years age group. Two patients were in the 61-70 years age group (Figure 2).

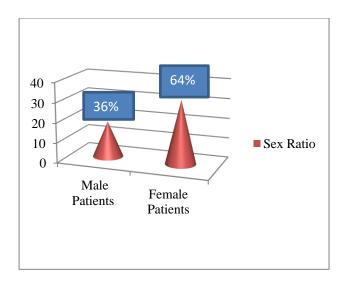


Figure 1: Sex ratio.

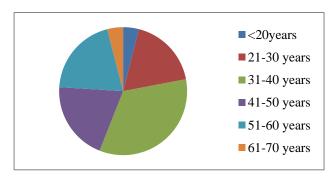


Figure 2: Age group of the patients.

Patients presented to surgical OPD with complaints of pain abdomen 24 (48%), nausea and vomiting 07 (14%), fever 08 (16%), flatulent dyspepsia 06 (12%), belching 04 (08%) and jaundice 01 (02%). Many of the patients had more than one complaint, we have considered chief presenting complaint (Figure 3).

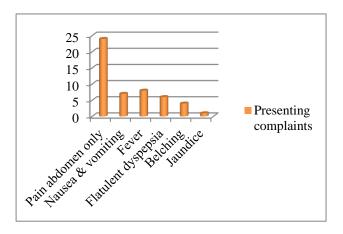


Figure 3: Presenting complaints.

After admitting patients in the ward ultrasonography abdomen and pelvis was conducted. Acute cholecystitis was noted in 06 (12%) patients. Cholelithiasis was noted in 38 (76%) patients. Cholesterosis was noted in 01

(02%) patient. Gallbladder polyp >10 mm was noted in 03 (06%) patients. Mucocele of gallbladder was noted in 01 (02%) patient. Empyema of gallbladder was noted in 01 (02%) patient (Figure 4).

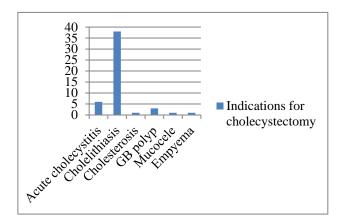


Figure 4: Indications for cholecystectomy.

In our study of 50 patients, four (08%) patients were converted to open procedure from laparoscopic cholecystectomy. In one case of laparoscopic cholecystectomy, it was uncontrolled bleeding which made us to convert it to open procedure. Similarly, in two more cases because of dense adhesions at Calot's triangle we couldn't identify cystic duct and cystic artery clearly, so we converted to open procedure. In one case iatrogenic injury to CBD was noticed and procedure was converted to open and CBD repair was done (Figure 5).

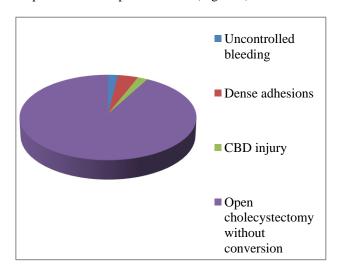


Figure 5: Etiology for conversion from laparoscopic cholecystectomy to open cholecystectomy.

In post-operative period we noticed bile leak in 01 (02%) patient. Bleeding was noted in 01 (02%) patient. Subphrenic abscess was noted in 01 (02%) patient. Surgical site infection was noted in 01 (02%) patient (Figure 6). We had placed abdominal drain kit no 28-32 size in subhepatic space in all patients. So, we easily managed many of above said complications. Injection Tranexamic acid 500 gm iv bd was given in haemorrhage

patient for 3 days. Injection Piptaz 4.5 gm iv bd and injection Metrogyl 100 ml iv tid were given for 7 days to control abscess. Antibiotics were chosen based on pus culture and sensitivity report.

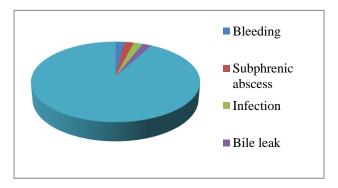


Figure 6: Post-operative complications.

DISCUSSION

In the present days laparoscopic cholecystectomy is the gold standard. But some situations still need open cholecystectomy. Depending on the clinical situation, the procedure can either begin as an open cholecystectomy or be converted to an open cholecystectomy from a laparoscopic one. Open cholecystectomy is indicated in patients who have trauma to the right upper quadrant and in the rare cases of penetrating trauma to the gallbladder. Some exclusive indications for open cholecystectomy where we can't go for laparoscopic intervention are suspected or confirmed gallbladder cancer, type II Mirizzi syndrome, gallstone ileus, severe cardiopulmonary disease.7

is When gallbladder carcinoma confirmed intraoperatively, an open cholecystectomy should be performed with consultation from an experienced hepatobiliary surgeon. If necessary, patient can be referred to a hepatobiliary surgeon for re-exploration.8 Open cholecystectomy is advice for gallbladder cancer, but most gallbladder cancers are identified incidentally during surgery or in the histopathological report. Open cholecystectomy is adviced in patients with cirrhosis and bleeding disorders and pregnant patients. In patients with advanced cirrhosis and bleeding disorders, potential bleeding may be difficult to manage laparoscopically, and an open procedure will be a better option. In patients with portal hypertension trying to place ports may cause Although haemorrhage. laparoscopic severe cholecystectomy is gold standard in pregnancy, open cholecystectomy should be considered for pregnant patients in the 3rd trimester, because laparoscopic port placement and insufflation will be difficult in 3rd trimester.9

Open cholecystecomy has less mortality and morbidity. Complication rate is in between 6-21%. This complication rate is old one. In present times complication rate is still lower. In our study we reported complication in 04 (08%) patients. We used abdominal

drain kit no 28-32 in all 50 patients. Use of drain helps in managing hemorrhage and biliary leak.11 Risk of infections and abscess formation can be reduced by following sterile methods and by avoiding bile and gallstone spillage during the procedure. In case of spillage, thorough irrigation should be used and stones should be retrieved to prevent abscess formation. 12 Bile leaks and CBD injuries cause biliary strictures. Bile leaks occur by faulty ligature of cystic duct. In some cases, ligature slips from cystic duct stump. Patients present with pain abdomen, nausea, vomiting and elevated LFT levels. ERCP is helpful in managing biliary complications. 13,14 CBD injuries increased twofold with the advent of laparoscopic cholecystectomy (1:200-5000cases). It is better to refer patient to a hepatobiliary surgeon once CBD injury is confirmed.¹⁵

Kara et al in their study of 1950 cases found that the main reasons for conversion from laparoscopic to open significant inflammation, cholecystectomy were inadequate dissection of Calot triangle because of fibrotic adhesions, and adhesions due to previous surgery. 16 Babb et al in their study found that even though laparoscopic cholecystectomy is accepted as the gold standard, open cholecystectomy is preferred in paediatric cases.¹⁷ Most open cholecystectomies result from conversion of a of laparoscopic procedure, because bleeding complications or frozen Calot's. Conversion rates for laparoscopic cholecystectomy vary from 1% 30%. Most series report the incidence of conversion to be <10%, and some series report 1-2%.18 Sutcliffe et al developed a validation risk score designed for preoperative identification of patients at high risk for conversion from laparoscopic to open cholecystectomy.¹⁹ This score has six predictors: age, sex, American Society Anaesthesiologists (ASA) score, thick-walled gallbladder, indication for surgery and common bile duct (CBD) diameter. If score is higher than 6, patients likely require conversion.

Ibrahim et al in their study found predictors of conversion to open cholecystectomy age greater than 60 years, weight exceeding 65 kg, male sex, the presence of acute cholecystitis, previous upper abdominal surgery, the presence of diabetes and high glycosylated haemoglobin levels, and a less experienced surgeon.20 Licciardello et alin their study found risk factors for conversion: increased age; acute cholecystitis; comorbidities; elevated white blood cell count; and increased levels of aspartate aminotransferase (AST), alanine aminotransferase (ALT), phosphatase alkaline (ALP), gamma glutamyl transpeptidase, C-reactive protein (CRP), fibrinogen.²¹ Last but not the least in developing countries like India, open cholecystectomy may be more cost-effective than the laparoscopic cholecystectomy and may therefore be preferred. Open cholecystectomy can also be done where laparoscopic facilities are not available, like in rural areas where majority of Indian population resides. Limitation of this study was we have not followed patients for at least 2-5 years to observe incidence of incisional hernia in open cholecystectomy patients.

CONCLUSION

Laparoscopic cholecystectomy is the gold standard in the present era, but it is important that the surgeon is also competent in doing open cholecystectomy. Some conditions require planned open cholecystecomy as the standard procedure. In difficult laparoscopic cases the surgeon must be prepared to convert to the open technique during the procedure. In both laparoscopic and open procedures surgeon should clearly define critical view of safety before cutting or applying clips/ligatures. Surgeons experience and proper clinical judgment skills are important in difficult cholecystectomy cases. Hence open cholecystectomy still has its own importance in the era of laparoscopic method.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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