



Comparitive Study of Laparoscopic Cholecystectomy And Open Cholecystectomy in A Teaching Hospital In Rayalaseema Region of Andhra Pradesh

KEYWORDS

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INTRODUCTION

Benign diseases of the biliary tract are one of the most common surgical problems in the world. Gallstones especially, affect millions¹. Surgery plays an important part in the treatment and over half a million cholecystectomies are performed worldwide².

Cholecystectomy was the universal standard for the treatment of symptomatic cholelithiasis³. The first open cholecystectomy was performed in 1882.

Since its introduction in France, laparoscopic cholecystectomy has become the treatment of choice for symptomatic cholelithiasis³.

The postulated advantages of laparoscopic cholecystectomy are the avoidance of large incision, shortened hospital stay and earlier return to work⁴.

Our purpose in this study is to compare results after cholecystectomy using a laparoscope to that using standard open technique, in an effort to determine if these proposed advantages could be achieved in practice.

AIMS AND OBJECTIVES

To assess safety and efficacy of laparoscopic cholecystectomy in comparison to open cholecystectomy.

To compare laparoscopic cholecystectomy versus open cholecystectomy in terms of:

- Duration of operation
- Hospital stay
- Postoperative analgesia
- Postoperative recovery
- Complications of each procedure
- Patient satisfaction

METHODOLOGY

This was a prospective study. This study consisted of 100 patients treated with cholecystectomy (50-open and 50-laparoscopic) in our hospital from October 2012 to May 2014.

Inclusion Criteria

All patients with acute cholecystitis, chronic cholecystitis, cholelithiasis, empyema, mucocele and gangrenous gallbladder.

Exclusion Criteria

Patients with choledocholithiasis, carcinoma of gallbladder, perforated gallbladder will be excluded from the study.

All the patients were admitted and a detailed history and clinical examination was carried out as per written proforma.

The choice of operation in each case is decided by:

- Patient's choice by explaining both procedures
- The preference of the surgeon in each case.

Patients opting for laparoscopic cholecystectomy were explained the possibility of conversion to open cholecystectomy.

Preoperatively patient's history was assessed with special reference to pain, fever, nausea, vomiting, dyspepsia, jaundice, mass per abdomen, weight loss and decreased appetite. A careful emphasis was made to record the physical findings, particularly icterus tenderness in right hypochondrium and gallbladder mass. Laboratory testing and USG of gallbladder and CBD was done. CBD stone was ruled out by USG.

A thorough preoperative anaesthetic evaluation was done and patient fitness for general anaesthesia assessed. A dose of antibiotics (usually a cephalosporin) was given 30 minutes before surgery. A nasogastric tube was inserted routinely.

Injectable antibiotics and analgesics were given for 2-3 days postoperatively. Then they were given orally for another 3 days. Patients were started orally between 24-48 hours post surgery in most cases. Sutures were removed usually by the 10th day. 0° Laparoscope was used for all laparoscopic procedures.

The patient was reviewed on the 7th day and 21st day after discharge. Follow up was done for a period of 6 months whenever possible.

METHOD OF COLLECTION OF DATA

- Operative steps, duration, intra and postoperative complication were noted in detail and tabulated.
- Postoperative assessment with respect to postoperative hospital stay, complications including postoperative pain will be included as per protocol attached.
- Conversion rate – cases that had encountered difficulty during laparoscopic cholecystectomy were converted to open but were included into laparoscopic group.
- At the end of the study comparison was made between open and laparoscopic cholecystectomy regarding:
 - Criteria for selection and indication for surgery
 - Duration of surgery
 - Complication
 - Resumption of oral intake
 - Hospital stay
 - Return to normal work
 - Patient satisfaction

The results were analyzed and conclusions were drawn.

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Statistical Methods

Chi-square and Fisher Exact test has been used to find the significance of proportion of age, sex, indications, complications, post-op pain, and patients'satisfaction between the two groups. Student t test has been used to find the significance of resumption of oral intake, duration of surgery, number of days of stay in hospital, return to normal work in days between the two groups.

Chi-square Test

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

where O_i is observed frequency and E_i is expected frequency

Fisher Exact Test

Class 1 Class 2 Total

	Class1	Class2	total
Sample1	a	b	A+b
Sample2	c	d	C+d
total	a+c	b+d	n

$$\text{Fisher Exact Test statistic} = \frac{1}{n!} \frac{(a+b)!(c+d)!(a+c)!(b+d)!}{a!b!c!d!}$$

Student t test

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{s^2 (1/n_1 + 1/n_2)}}$$

$$\text{Where } s^2 = \frac{(n_1 - 1) \sum (x_1 - \bar{x}_1)^2 + (n_2 - 1) \sum (x_2 - \bar{x}_2)^2}{n_1 + n_2 - 2}$$

Statistical software: The statistical software namely SPSS 11.0 and Systat 8.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, results This prospective study comprised of 100 patients with biliary tract symptoms who were admitted to the surgical inpatient ward in Kurnool Medical College and Research Institute, Kurnool and underwent cholecystectomy during the period of October 2012 to May 2014.

Total no. of cases – 100
 No. of open cholecystectomy – 50
 No. of laparoscopic cholecystectomy – 50

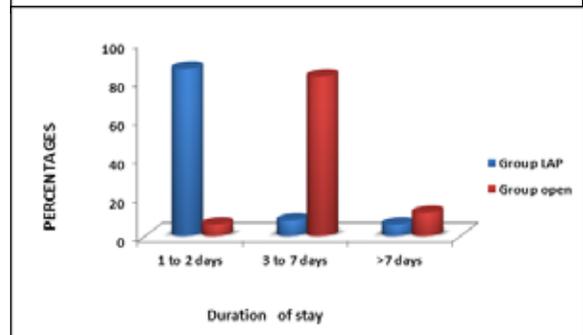
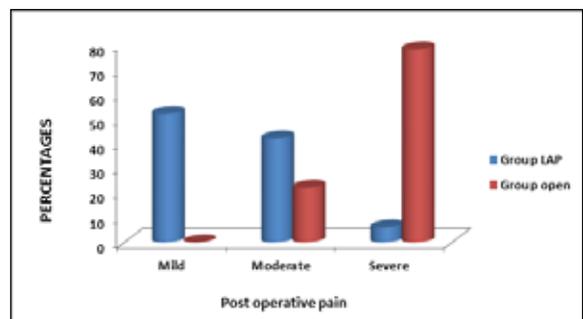
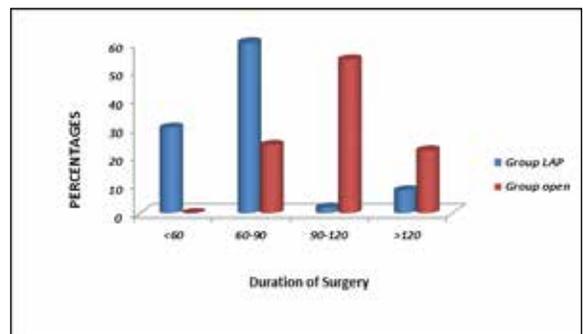
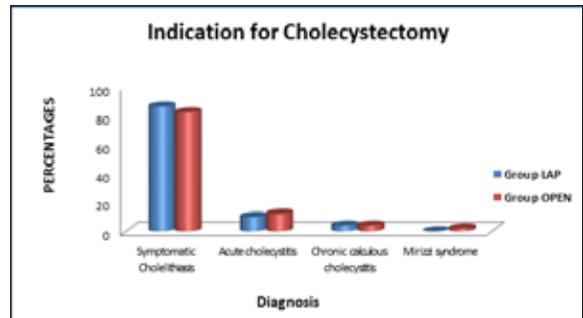
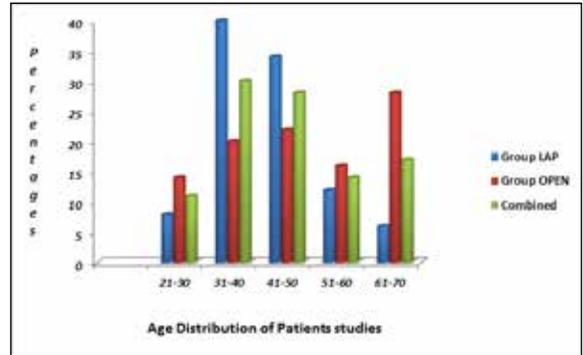
All cases underwent detailed preoperative assessment; their preoperative findings and postoperative complications were meticulously recorded as per protocol. The findings were tabulated and the following observations were made.

Study design

A prospective clinical study consisting of 100 patients undergoing cholecystectomy

randomized in two groups – 50 patients in group LAP (laparoscopic cholecystectomy) and 50 patients in group OPEN (open cholecystectomy) is undertaken to compare the two procedures with respect to :

- Criteria for selection and indication for surgery
- Duration of surgery
- Complication
- Hospital stay
- Return to normal work
- Patient satisfaction



DISCUSSION

Cholelithiasis is a common disease entity. Frequent occurrence and serious complications of cholelithiasis have made this one of the most important surgically correctable diseases.

Laparoscopic cholecystectomy has significantly changed the treatment of gallstone disease. Although this new technique has been adopted by many practicing surgeons, concern about the incidence of major complications still exists.

The morbidity and mortality associated with laparoscopic cholecystectomy should be comparable to open cholecystectomy before it is accepted as the treatment of choice for gallstone disease. Several large published series have reported their experience with laparoscopic cholecystectomy.

This was a comparative clinical study consisting of 100 patients undergoing cholecystectomy conducted in our institute, Kurnool Medical College and Government general hospital, Kurnool, from October 2012 to May 2014.

The patients were randomized into two groups; 50 patients in Group LAP (laparoscopic cholecystectomy) and 50 patients in group OPEN (open cholecystectomy).

The study was undertaken to compare the efficacy, safety and patients' satisfaction between the two procedures.

A comparative study was made on:

- Duration of surgery
- Complications
- Postoperative pain
- Period of hospital stay
- Return to normal work
- Patient satisfaction

The observations and calculated means were subjected to statistical analysis. The statistical analysis used was

- Chi-square test
- Fisher test
- Odds ratio

Age and sex

The main sufferers of gallbladder disease in our study were females as compared to males. Out of total 100 cases, 23 cases were males, which are very much similar to those observed by Frazee and others⁵ and U. Berggren and others⁶. Most of the males affected were in the 5th and 6th decades of life whereas females were in the 4th and 5th decades of life.

The reason for the high incidence among females could be that pregnancy and child birth have a definitive influence on biliary tract disease, acting by causal stasis as well as weight gain and consequent hypercholesterolemia. Another reason could be the effect of female hormones i.e. estrogen and progesterone, especially progesterone acting on the gallbladder and reducing motility, causing stasis and thereby promoting gallstone formation.

sex	Present series	North American series
Male	23 23%	80
Female	77 77%	170

Out of 100 cases the females were 77 and the males were 23 showing the incidence is slightly higher in females.

Age

No age is said to be immune to gallbladder disease, however they were more common in the third, fourth and fifth decades of life as 72% of the cases belonged to these decades. Workers like Thomas B Hugh et al⁷, R Schmitz et al⁸ have reported a similar peak incidence in the 4th and 5th decade.

In our study majority were in the age group of 31 to 50 years and constituted 72% while in north American series the majority of the patients were in the age group of 51 to 60 year

Duration of surgery

The duration of surgery was lesser in the lap group at 60 – 90 mins in laparoscopic group compared with 90 – 120 minutes in open group. Other studies quoted Sooper et al⁹ 95 minutes for laparoscopic and 122 min for open.

	Group Lap	Group Open
AJ Karayiannakis et al	105 minutes	98 minutes
Ravimohan SM et al	46.8 minutes	44.7 minutes
Bart M Redemaker	78 minutes	90.5 minutes
Sooper et al	95 minutes	122 minutes
Axe ROS et al	93 minutes	118 minutes

The duration of surgery is lesser in the LAP group when compared to the OPEN group for the following reasons :

- 1). Ease of access – laparoscopic cholecystectomy requires the creation of few small port sites in the abdomen for insertion of the instruments hence, the time taken to open the abdomen by dissecting the muscles and fascia is minimized when compared to the open procedure and conversely closure of the port sites is faster when compared to closing a large abdominal incision.
- 2). Better visualization of the anatomy using during laparoscopy aided by the better light sources and lens systems which magnify the view thereby facilitating easy dissection and avoidance of complications.
- 3). Laparoscopic cholecystectomy is performed under general anaesthesia, hence the anaesthetic time is also minimized, thereby minimizing total procedure time.

Complications

The overall rates of complications were more in the open group. The most common complications found were wound and chest infection (seen almost exclusively in open group). These findings can be explained on the basis of a large subcostal incision used in the open group. The presence of such a large incision and the associated pain inhibits respiratory movements, thereby leading to atelectasis and pulmonary infection

The large wound hematoma associated with a large incision can act as a nidus for infection thereby leading to wound infection and its associated complications like delayed wound healing, wound dehiscence, incisional hernia etc

Other complications like bile duct injury, major bleeding requiring conversion to open cholecystectomy, visceral injury were not encountered probably due to improved visualization afforded by the laparoscope thereby facilitating

better delineation of normal anatomy and also early detection of aberrant anatomy.

There was no mortality in this study.

CONCLUSION

The results support the view that laparoscopic cholecystectomy is a safe and justified replacement for open cholecystectomy.

There is a definite learning curve for surgeons who are newly exposed. The complication rates reduced as the surgeons become more experienced in this procedure to a level comparable with that of open cholecystectomy. Though there were a few conversions to open cholecystectomy, this reflects the good judgement of the surgeon keeping in view the safety of the patient as the foremost priority.

Laparoscopic cholecystectomy was safe with less postoperative morbidity associated with faster patient recovery and satisfaction as documented by less postoperative pain, earlier resumption of oral feeds, earlier full mobilization and discharge home, as well as early return to work.

In conclusion, the study supports the view that laparoscopic cholecystectomy is safer and efficacious and offers definitive advantages over open cholecystectomy and should be an available option for all patients requiring elective cholecystectomy. Laparoscopic cholecystectomy can be considered the gold standard against which other procedures have to be compared.

SUMMARY

The purpose of present study was to evaluate the safety and efficacy of laparoscopic cholecystectomy in comparison with open cholecystectomy.

The present study comprised of 100 patients who underwent open and laparoscopic cholecystectomy.

All cases underwent detailed preoperative assessment, their preoperative findings and postoperative complications were meticulously recorded as per protocol.

The observations in our study are summarized below:

- The age and sex distribution of the whole series corresponds fairly well with the usual age and sex affection of gallbladder disease. Overall there was a female preponderance and the peak age group affected was 3rd, 4th and 5th decades. Most of the males affected were in the 5th and 6th decades of life.
- The most common indication for cholecystectomy was cholelithiasis followed by acute calculous cholecystitis.
- Three cases were converted from laparoscopic to open cholecystectomy. Two were converted as the anatomy of Calot's triangle was not delineated and one due to a large calculus in the cystic duct that could not be extracted.
- The mean operative time in laparoscopic group was 71.11 min compared to 111.2 min in open cholecystectomy group

Complications

Major complications like bile duct injury were not seen in our study. This indicates that as surgeons become experienced the rate of bile duct injury decreases. Open group had more complications like wound infections, chest infections, probably because of the long incision and dissection and also the site of the incision might impede proper coughing and breathing due to pain.

The patients in the laparoscopic group had less pain, started oral intake earlier and were discharged earlier compared to open group. They were also able to resume their normal work sooner.

No mortality was seen in our study in both groups.

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