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ORIGINAL RESEARCH

A comparative study of the outcome of open cholecystectomy and laparoscopic cholecystectomy at a tertiary centre

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ABSTRACT
Background: Surgeons have been both excited and disbelieving about the development of laparoscopic cholecystectomy (LC) and other laparoscopic operations in general surgery over the past two years. The present study was conducted to compare the outcome of open cholecystectomy (OC) and laparoscopic cholecystectomy (LC).
Materials & Methods: 70 patients of acute cholecystitis of both genders were divided into 2 groups of thirty-five patients each. OC patients made up group I, whereas LC patients made up group II. Pain on the VAS, length of operation, complications, and length of hospital stay were recorded.
Results: Group I had 14 males and 21 females and group II had 18 males and 17 females. The mean duration of surgery was 62.3 minutes in group I and 81.2 minutes in group II. The mean time to oral feed was 18 hours in group I and 11 hours in group II. The mean blood loss >100 ml was seen in 3 in group I and 8 in group II. The mean hospital stay was 5.6 days in group I and 3. 4 days in group II. Pain on VAS was 3.8 in group I and 2.6 in group II. The difference was significant (P< 0.05). Complications were bleeding in 6 patients in group I and 3 patients in group II, jaundice in 3 and 1, infection in 5 and 2, nausea/ vomiting in 8 and 3 patients in group I and II respectively.
Conclusion: Patients with gallstones responded well to laparoscopic cholecystectomy. Compared to an open cholecystectomy, there were fewer post-operative problems.
Keywords: Laparoscopic cholecystectomy, Cholelithiasis, bleeding

Introduction

Surgeons have been both excited and disbelieving about the development of laparoscopic cholecystectomy (LC) and other laparoscopic operations in general surgery over the past two years.[1] Numerous global centres have reported a growing number of patients treated with laparoscopic cholecystectomy in their initial articles detailing their experience with the new surgical technique.[2] Gallstones are known to become more common as people age, and demographic research has shown that women are more prone than men to get gallstones. Around 20% of women and 5% of men between the ages of 50 and 65 are thought to be affected by gallstones.[3]
A known risk factor for the development of cholelithiasis, obesity, and advanced age, will likely contribute to an increase in the incidence of gallstones, one of the leading causes of morbidity worldwide, in the coming year.[4]
These days, the classic cholecystectomy operation has mostly been superseded with less invasive methods called LC and MC. On the other hand, there are disagreements on the benefits and drawbacks of laparoscopic versus mini-laparotomy surgery. The insufflation of carbon dioxide might cause arrhythmias in persons suffering from heart conditions.[5] Inadequate structural visibility may further raise the possibility of bleeding and injury to or leakage from the bile ducts. When combined with the high expense of equipment, performing laparoscopic procedures in inadequate setups might be challenging.[6]
Aims and objectives: The present study was conducted to compare the outcome of open cholecystectomy (OC) and laparoscopic cholecystectomy (LC).

Materials & Methods

The present prospective study was carried out in the Department of Surgery, Government Medical College and Hospital, Bettiah, West Champaran, Bihar, India. All patients admitted in General surgical Ward/unit either through OPD or emergency, presenting with acute cholecystitis of both genders were included. The present study consisted of 70 patients of acute cholecystitis of both genders. All patients gave their written consent to participate in the study. The institutional ethical committee granted ethical approval. The duration of study was from June 2022 to May 2023. All patients completed a minimum of 1-year follow-up and the follow-up data

was collected and finally evaluated. Keeping power (1-beta error) at 80% and confidence interval (1-alpha error) at 95%, the minimum sample size required was 60 patients; therefore, we included 70 (more than the minimum required number of cases) patients in the present study.

Inclusion Criteria

- Patients to give written informed consent
- Symptomatic patients aged 18 to 60 years who had laparoscopic or open cholecystectomy for acute cholecystitis, as determined by ultrasonography.
- Available for follow up.

Exclusion Criteria:

- Patients not give written informed consent
- Patients younger than 18 years old and older than 60 years old.
- Consuming alcohol, pregnant and lactating women, gallbladder masses, mucocele, empyema, portal hypertension and
- Patients with preoperatively diagnosed choledocholithiasis

Data such as name, age, gender, etc. was recorded. All patients received a general examination and history-taking procedure. Before the procedure, standard investigations and radiological imaging were carried out. There were two groups of thirty-five patients each. OC patients made up group I, whereas LC patients made up group II. Body mass index (BMI), blood loss, history of jaundice, pain on the VAS, length of operation, complications, and length of hospital stay were among the parameters that were noted.

Statistical analysis: In present study, data was analysed by two statistical software-Statistical package for the social sciences (SPSS) version 22.0 and Microsoft 16. The categorical data namely; Intra operative and Postoperative complication was analysed by Chi-square test. The Independent sample 't' test was used to compared ordinal data namely age, operating time, post-operative pain and duration of stay in hospital. A p value of < 0.05 was considered as statistically significant.

Results

The mean age of the patients was 41.73 ±10.15 years in Group I (*open cholecystectomy)* and36.97 ±9.58 years in Group II (*laparoscopic cholecystectomy)***.**

Table I: Socio-demographic profile of patients in the two groups.

parameters	Subcategory	Group I (OC) n=35	Group II (LC) n=35	P value
Gender	Male	14	18	0.43
	Female	21	17	
Residence	Urban	05	09	0.20
	Rural	30	26	
Mean age in years		41.73 ±10.15	36.97±9.58	0.06

OC=open cholecystectomy LC= laparoscopic cholecystectomy

Table ,. shows that group I had 14 males and 21 females and group II had 18 males and 17 females. The ages of the patients ranged from 18 to 60 years old. The majority of patients were females (54.29%) and from rural areas (80%).

Table II: Comparison of parameters

Parameters	Group I (n=35)	Group II (n=35)	P value
Duration of surgery (mins)	62.3± 12.53	81.2 ±10.95	0.02
Time to oral feed (hours)	18 ± 6.03	11± 8.72	0.04
Blood loss (>100 ml)	3 ±1.68	8 ± 1.05	0.03
Hospital stay (days)	5.6 ± 1.63	3.4 ± 1.23	0.04
Pain (VAS)	3.8	2.6	0.05

Table: II, figure 1, shows that the mean duration of surgery was 62.3 minutes in group I and 81.2 minutes in group II. The mean time to oral feed was 18 hours in group I and 11 hours in group II. The mean blood loss >100 ml was seen in 3 in group I and 8 in group II. The mean hospital stay was 5.6 days in group I and 3. 4 days in group II. Pain on VAS was 3.8 in group I and 2.6 in group II. The difference was significant ($P< 0.05$).

Figure 1: Comparison of parameters

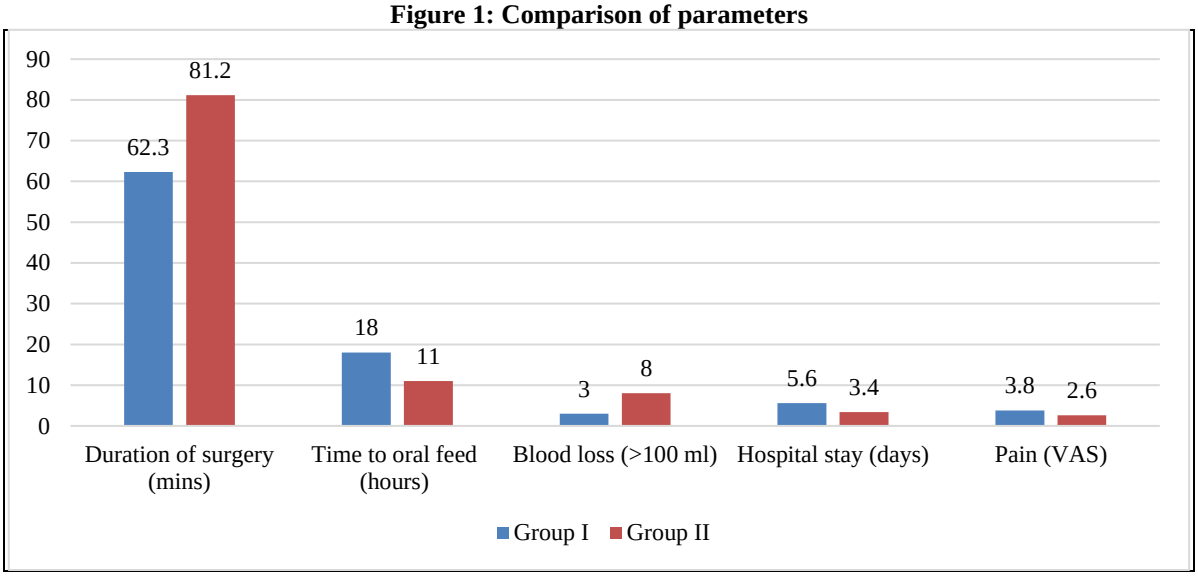
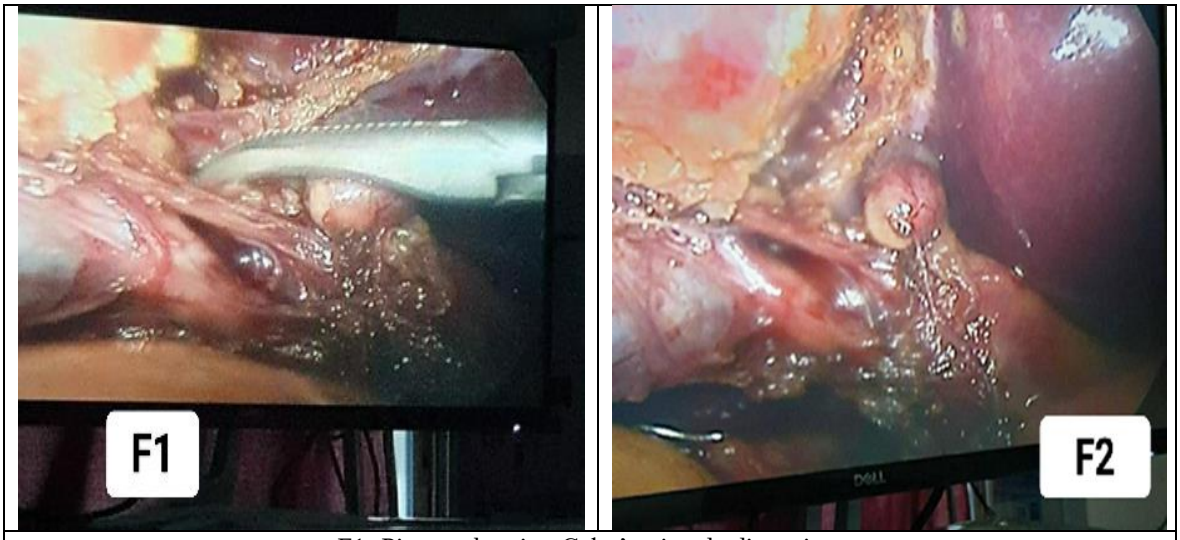


Table III: Evaluation of post-operative complications

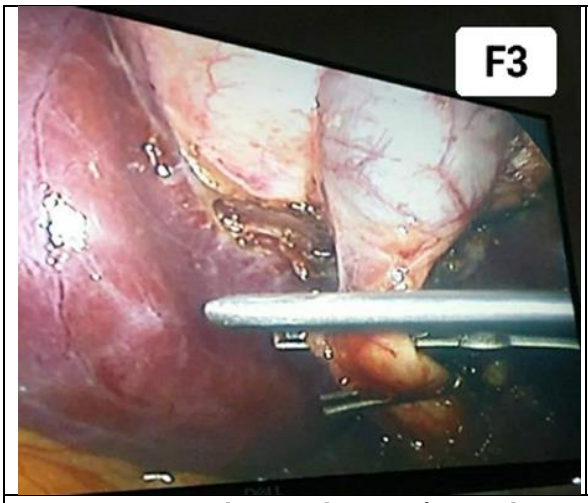
Complications	Group I	Group II	P value
Bleeding	6	3	0.02
Jaundice	3	1	0.04
Infection	5	2	0.03
Nausea/ Vomiting	8	3	0.02

Chi square distribution=0.781

Table III shows that complications were bleeding in 6 patients in group I and 3 patients in group II, jaundice in 3 and 1, infection in 5 and 2, nausea/ vomiting in 8 and 3 patients in group I and II respectively. The difference was significant (P< 0.05).



F1**:** Picture showing Calot's triangle dissection,
F2**:** Picture showing porta after division of cystic duct and cystic artery



F3: Picture showing clipping of cystic duct, F4: Picture showing dissected Calot's triangle

Discussion

Laparoscopic cholecystectomy is a minimally invasive surgical procedure used to remove the gallbladder. It is typically performed when a patient has gallstones or other gallbladder-related issues.[7,8] During the procedure, small incisions are made in the abdomen, through which a laparoscope (a thin tube with a camera) and other surgical instruments are inserted.[9] The surgeon uses these instruments to visualize the gallbladder and surrounding structures and then remove the gallbladder.[10] Compared to traditional open surgery, laparoscopic cholecystectomy generally results in less pain, shorter hospital stays, and quicker recovery times.[11,12]The present study was conducted to compare outcome of open cholecystectomy (OC) and laparoscopic cholecystectomy (LC). We found that group I had 14 males and 21 females and group II had 18 males and 17 females. The majority of patients were females (54.29%) and from rural areas (80%). In Glinatis et al.'s[13] study, two groups of 40 patients—31 females and 9 males—who underwent elective open cholecystectomy (Group I) or elective laparoscopic cholecystectomy (Group II) were analyzed retrospectively to look for variations in the length of hospital stays, operating times, morbidity and mortality, and postoperative analgesic use. The patients were matched for age and body mass index. The gallstone disease histories of the two patient groups were almost the same. Group I patients had a median operating time of 45 minutes (range 35-95), while Group II patients had a median operating time of 90 minutes (range 50-135). Twenty-one patients in Group I and twenty-two patients in Group II underwent an intraoperative cholangiogram. Not a single person died in either group. There were 22.5% complications overall. In Group I, the overall complication rate was 22.5%, while in Group II, it was 10%. For Group I patients, the median postoperative duration of stay was five days, but for Group II patients it was two days. While 10% of Group II patients did not require any analgesia at all and 16% were able to control their pain with oral analgesics alone, all Group I patients needed postoperative intravenous or intramuscular opiates. Group I patients received a median total morphine dose of 46.9 mg (range 9.4-180), while Group II patients received a dose of only 15.6 mg (6.2-37.5). According to the study's findings, there were fewer problems, shorter hospital stays, and less postoperative analgesic use following a laparoscopic cholecystectomy. The age and gender profile of patients enrolled in the present study resembled those reported by Al-Otibi and Al-Junaid[14], who reported the mean age of patients to be 46.1 years and found that 81% of their patients were women.

We observed that the mean duration of surgery was 62.3 minutes in group I and 81.2 minutes in group II. The mean time to oral feed was 18 hours in group I and 11 hours in group II. The mean blood loss >100 ml was seen in 3 in group I and 8 in group II. The mean hospital stay was 5.6 days in group I and 3. 4 days in group II. Pain on VAS was 3.8 in group I and 2.6 in group II. We found that complications were bleeding in 6 patients in group I and 3 patients in group II, jaundice in 3 and 1, infection in 5 and 2, nausea/ vomiting in 8 and 3 patients in group I and II respectively. A total of 2032 patients were involved in studies by Purkayastha et al.[15] to compare the LC and MC. All outcome indicators, except for surgical time and hospital stay, did not yield statistically significant results. In the group that conducted the LC, the mean surgical time was 14.14 minutes longer, and in the group that made the MC, the mean hospitalization time was 0.37 days longer. In contrast, they discovered that the group performing the MC had a mean hospital stay of 0.79 days and an average operational time that was 31.83 minutes longer than that of the LC in this review.

Limitations of the study: The limitation of the study is the small sample size and short duration of study.

Conclusion

The authors found that patients with gallstones responded well to laparoscopic cholecystectomy. Compared to an open cholecystectomy, there were fewer post-operative problems.

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