

Open cholecystectomy versus laparoscopic cholecystectomy: A comparative study at north Indian based teaching hospital

¹Dr. Vipin Kumar, ²Dr. E.D. Reddy, ³Dr. Chandra Shekhar, ⁴Dr. Madhu Sinha

¹Assistant Professor, Department of Surgery, Government Medical College, Budaun, Link Rd, Gunera, Wazidpur, Uttar Pradesh, India

²Senior Consultant, Department of Surgery, Apollo Spectra, Hospitals, Shyam Karan Road, Anand Wagh, Ameerpet, Hyderabad, Telangana, India

^{3,4}Senior Consultant & Head, Department of Neurosurgery Janakpuri Super Speciality Hospital C2B, Janakpuri, New Delhi, India

Corresponding Author: Dr. Vipin Kumar (drvipin07@gmail.com)

Abstract

Background: Gallstone disease (GSD or Cholelithiasis) is a significant health problem both worlds over (in both developing and developed nations). The main objective is Laparoscopic cholecystectomy has rapidly become established as the popular alternative to open cholecystectomy, but it should have a safety profile better than of open procedure.

Aims and objectives: The aim of this study was to compare conventional cholecystectomy and laparoscopic cholecystectomy with respect to duration of procedure, complications, postoperative pain, analgesic requirement and period of hospital stay.

Materials and Methods: This study consists of 52 patients who have undergone gallbladder removal in GMC Budaun. 26 patients who have undergone laparoscopic cholecystectomy and 26 patients who have undergone open cholecystectomy for a study period of one year have been taken into the study. In method 52 consecutive patients below 70 years presenting with calculous cholecystitis with no evidence of CBD stones were randomized to undergo open and laparoscopic cholecystectomy.

Results: 9 patients of LC and 10 patients of OC were males. Among LC 16 patients were females and among OC group 15 were females, 28% of patients who underwent open surgery had complications and 16% of patients who underwent laparoscopic surgery had complications. The overall percentage of complications is lesser in laparoscopic surgery than open surgery, The VAS was median grade 2 in LC group as compared to median grade 4 in OC group. The NSAID'S were used for more days in OC group compared to LC group, 23 patients who underwent laparoscopic cholecystectomy were discharged before 5 days. All patients who underwent OC stayed >5 days in hospital.

Conclusion: Here we conclude in results, the duration of pain, rate of complications and hospital stay were significantly lower in laparoscopic group. However the main advantages of LC were reduced postoperative pain with less duration of analgesic intake, more rapid recovery, reduced hospital stay and early return to normal work.

Keyword: bile duct injury, gallstones, cholelithiasis, laparoscopic cholecystectomy, open cholecystectomy

Introduction

Gallstone disease (GSD or Cholelithiasis) is a significant health problem both worlds over (in

both developing and developed nations). Gallstone (GS) disease is a major health problem worldwide particularly in the adult population ^[1]. Gallstones are a common occurrence in northern India. Prevalence of gallstone ranges from 10 to 20% in India ^[2]. It affects nearly 4.3% of the population. Gall stones are one of the major causes of morbidity and mortality all over the world. Until the end of 1980's, open Cholecystectomy was the gold standard for treatment of stones in gall bladder. First Cholecystectomy performed in 1882 by Karl Langenbuch ^[3]. In the early 1990s, the laparoscopic approach rapidly replaced open surgery as the standard procedure. The laparoscopic procedure was found to cause less scarring, shorter hospital stay and faster recovery than the open procedure, but probably at the expense of a higher rate of bile duct injuries ^[4].

We live in an era of surgical innovation that has seen the development and expansion of various types of laparoscopic surgery in which the incisions made are increasingly small. It is well established that laparoscopic surgery, in comparison with more traditional methods, results in fewer post-operative complications and leads to earlier patient mobility and recovery of the normal activities of daily life. The safety of laparoscopic cholecystectomy for the elderly has also been confirmed in many studies as an acceptable procedure and is now the preferred method cholecystectomy ^[5].

The major complications are significantly less in laparoscopic cholecystectomy and it has become the mainstay of management of uncomplicated gallstone disease. However 20 years after its inception, uncertainty persists about the application of laparoscopic techniques to the management of patients with complicated gallstone disease ^[6].

Post-operative pain, cosmesis and later complication like incisional hernia, intestinal obstruction should help to decide which technique are better ^[7]. Aims and objectives the aim of this study was to compare conventional cholecystectomy and laparoscopic cholecystectomy with respect to duration of procedure, complications, postoperative pain, analgesic requirement & period of hospital stay.

Materials and Methods

This study consists of 52 patients who have undergone gallbladder removal in GMC Budaun. 26 patients who have undergone laparoscopic cholecystectomy and 26 patients who have undergone open cholecystectomy for a study period of one year.

Inclusion criteria

- Patients with cholelithiasis proved by USG with symptomatology consistent with cholelithiasis fit for elective cholecystectomy will be included in the study.

Exclusion criteria: Patients with following conditions will be excluded from the study.

- History or investigations suggesting CBD stones.
- History of previous abdominal surgery.
- Patient's age above 70 years.

Follow-up: The patients were followed up for 3-8 months.

Results

9 patients of LC and 10 patients of OC were males. Among LC 16 patients were females and among OC group 15 were females (Table-1) and Fig-1.

The time taken was generally lesser in laparoscopy surgery than in open cholecystectomy (Table-2) and Fig-2.

28% of patients who underwent open surgery had complications and 16% of patients who underwent laparoscopic surgery had complications. The overall percentage of complications

is lesser in laparoscopic surgery than open surgery (Table-3) and Fig-3.

The VAS was median grade 2 in LC group as compared to median grade 4 in LC group. The NSAID'S were used for more days in OC group compared to LC group (Table-4).

23 patients who underwent laparoscopic surgery had analgesics only for a maximum of 5 days whereas all patients who underwent open surgery had analgesics for >5 days (Table-5) and Fig-4.

23 patients who underwent laparoscopic cholecystectomy were discharged before 5 days. All patients who underwent OC stayed >5 days in hospital (Table-6) and Fig-5.

Table 1: Sex distribution

Sex	Laparoscopic Cholecystectomy	Open cholecystectomy
Male	10	10
Female	16	16

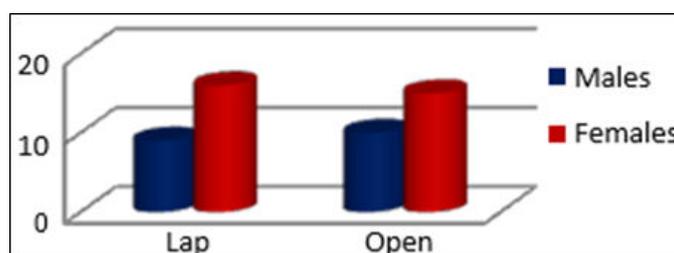


Fig 1: Sex distribution

Table 2: Time taken for surgery

Laparoscopic cholecystectomy				Open cholecystectomy			
< 1½	%	> 1½	%	> 1½	%	> 1½	%
22	88	3	12	17	68	8	32

P value = < 0.05

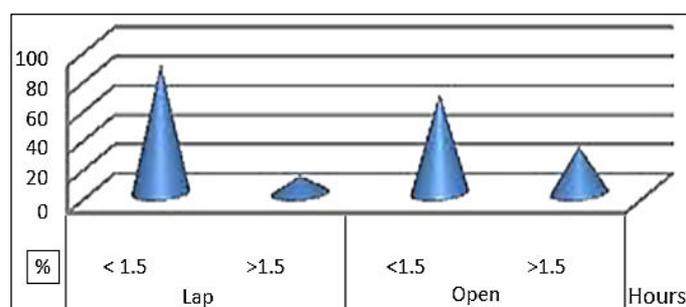


Fig 2: Time taken for surgery

Table 3: Complications

Complication	Open	%	Lap	%
Bleeding	3	12	3	12
Wound infection	4	16	1	4
CBD injury	0	0	0	0
Total		28		16

P value = <0.05

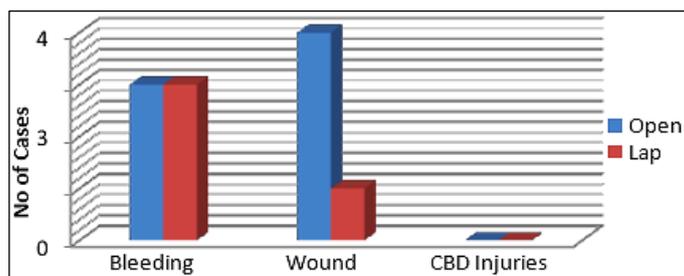


Fig 3: Complications

Table 4: Pain score

	LC	OC	P Value
VAS (Grade 0.5)	Grade 2	Grade 4	0.024
Range	0-3	1-5	(S)

P value = <0.001

Table 5: Number of days of analgesics

Surgery	<5 days	%	>5 days	%
LC	23	92	2	8
OC	0	0	25	100

LC (Laparoscopic cholecystectomy) OC (Open cholecystectomy) P value = <0.001

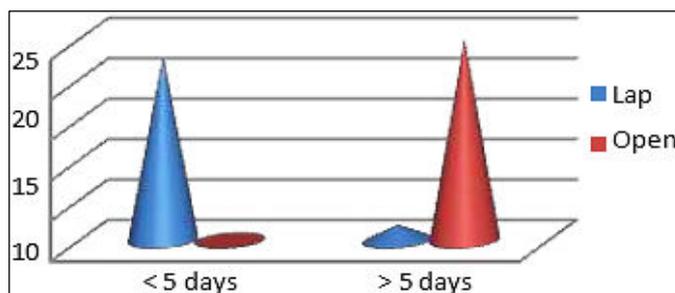


Table 6: Number of days of in hospital stay

Surgery	<5 days	%	>5 days	%
LC	23	92	2	8
OC	0	0	25	100

LC (Laparoscopic cholecystectomy) OC (Open cholecystectomy) P value = <0.001

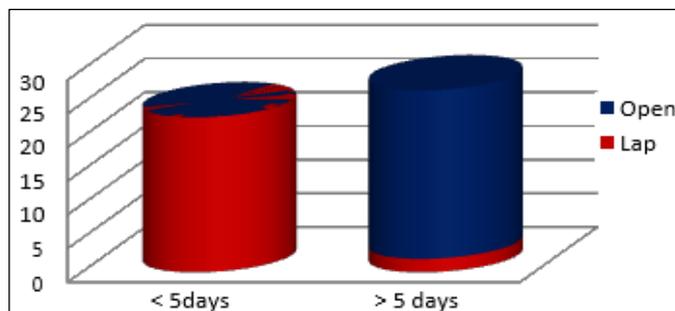


Fig 5: Hospital Stay

Discussion

Earlier open cholecystectomy was the gold standard for treatment of stones in the gall bladder. The classical open cholecystectomy (OC) and the minimally invasive laparoscopic

cholecystectomy (LC) are two alternative operations for removal of the gallbladder. The time taken for laparoscopic surgery was found to be more than open cholecystectomy according to Supe AN *et al.*,^[8] According to Waldner H *et al.*; there was no significant time difference between both the procedures^[9]. According to the author's study the overall time taken for laparoscopic surgery was found to be less than for open surgery. 12% of patients according to author's study, who had undergone laparoscopic cholecystectomy only had minimal bleeding (< 50ml), whereas only 8% of patients who underwent open surgery had about 50-200 ml of bleeding and 4% in the open cholecystectomy group had more than 200ml of blood loss. Patients who underwent open cholecystectomy need antibiotics coverage for at least 4 to 5 days more than the patients who undergo laparoscopic cholecystectomy according to Supe AN *et al.*^[10]. Antibiotic requirement was found to be less in laparoscopic surgery according to Foster D.S *et al.* and Phillips E *et al.*^[11, 12]. In the author's study 92% of patients who underwent laparoscopic surgery required antibiotic for a maximum of 5 days whereas all patients who underwent open surgery required antibiotic for more than 5 days.

23 of laparoscopic cholecystectomy patients in the author's study, required analgesics for less than 5 days. In the open surgery analgesic requirement was for at least 8-10 days. Two patients even required analgesics for upto 15 days. Need for analgesic is more in open than in laparoscopic surgery according to Waldner H *et al.*; and Supe AN *et al.*; In Carbajo Caballero *et al.*'s study the rate of complications was more in the open procedure than in laparoscopic cholecystectomy. Complication rate is higher in open than in laparoscopic surgery^[7, 13]. In the author's study 12% of patients who underwent open cholecystectomy had excessive bleeding, 16% had wound infection. In laparoscopic surgery the rate of complications was found to be 12% for bleeding which was minimal, 4% for wound infection.

Patients who underwent open cholecystectomy had longer in hospital stay than those who underwent laparoscopic cholecystectomy. According to Verma G *et al.*^[14] 96% of patients in the authors study had an hospital stay of less than 5 days but all patients who underwent open surgery were hospitalized postoperatively for more than 5 days.

In the studies conducted by Carbajo *et al.* Supe AN *et al.* and Verma GR *et al.*^[14] patients who underwent laparoscopic cholecystectomy could get back to their routine work faster. The mean time taken for laparoscopic patients to resume routine activity was 12.8 days and 34.8 days in open surgery as seen in Steven HP *et al.*'s study. In the authors study only 2 patients who had laparoscopic surgery took more than 1 week to resume routine work whereas all patients who underwent open surgery took upto 2 weeks and more to resume routine work.

According to Stevens HP *et al.* The cost involved in open surgery is found to be more than in laparoscopic surgery. In one study there was not much cost different between both procedures. According to the author's study laparoscopic surgery averagely worked out to cost about 11,500-12,500 rupees and open surgery about 9,000-10,000 rupees and also depending upon the location, country, and kind of facilities do you avail in the particular hospital. Gallstone disease is a major problem worldwide particularly.

In adult population. Its incidence shows a considerable, Geographical and regional variation^[15]. The Morbidity and Mortality associated with cholecystectomy has decreased to An extremely low level in the past few decades^[16]. In the Modern era of surgery. Very few operations have revolutionized the thought process and operating technique of surgeons as swiftly and in such major way as Laparoscopic cholecystectomy.

Conclusion

The laparoscopic cholecystectomy is a safe and effective treatment of complicated gallstone disease Laparoscopic cholecystectomy is better than open cholecystectomy in terms of post-operative pain, analgesic Requirement and early return to work. Laparoscopic cholecystectomy is a considerable advancement in the treatment of gallbladder disease. The advantages of laparoscopic cholecystectomy are several.

- Technically, the dissection of the cystic artery and cystic duct is very precise and bleeding

is easily controlled with less perioperative blood loss.

- LC is associated with less chances of wound infection and there is no risk of wound dehiscence.
- The degree of post-operative pain and its duration is less.
- The duration of hospital stay is less and patients can be discharged quickly from the hospital.
- The cosmetic advantage in LC is obvious.

Conflicts of interests: None.

Source of funding: None.

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