

## Laparoscopic vs. Open Cholecystectomy in a Peripheral Teaching Hospital: A Retrospective Study

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### ABSTRACT

**Objectives:** To study the technique of laparoscopic cholecystectomy, to study common difficulties encountered in lap cholecystectomy, to evaluate the common complications of lap cholecystectomy, duration of intra venous treatment, removal of drain, and the measures to improve the result of laparoscopic cholecystectomy in our institute.

**Methods:** This study was conducted on 150 patients of symptomatic cholelithiasis requiring elective surgery, attending the surgical OPD in Rama Medical College Hapur, from Jan 2017 to Jan 2018. We involve patients of all ages and both sexes. We excluded individuals having jaundice, acute cholecystitis, abnormal LFT or patients of choledocholithiasis.

**Results:** Peak incidence of gall stone disease in my study was in the 4<sup>th</sup> decade (36%) followed by 3<sup>rd</sup> and 5<sup>th</sup> decade (15% and 17%). In present study, the majority of the cases were females, with male to female ratio of 1:7. The duration of the procedure was 57.2 and 71minutes, respectively, with no significant difference between OC and LC. Drain was placed in 35 patients out of 100 successful laparoscopic cholecystectomies. Patients undergoing lap cholecystectomies had shorter hospital stays (2.01 versus 2.95 days, p=0.0001).

**Conclusion:** It is evident that laparoscopic cholecystectomy is

certainly better than open cholecystectomy while it did not differ much from open cholecystectomy regarding mortality, major complications and bile duct injuries. The advantages of laparoscopic cholecystectomy over open cholecystectomy are less postoperative pain, less operative time, less duration of intravenous antibiotic use, lesser incidence of wound infection, shorter hospital stay and earlier return to normal activity.

**Key words:** Laparoscopic Cholecystectomy (LC), Open Cholecystectomy (OC), Postoperative Complications.

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### INTRODUCTION

Gallstones are a common occurrence in northern India. Laparoscopic cholecystectomy provides a safe alternative for symptomatic cholelithiasis and the benefits, lower morbidity and reduced hospital stay, was demonstrated in prospective studies and meta-analyses.<sup>1-3</sup> Karl Langenbuch in 1882 quoted "The gallbladder should be removed, not because it contains stones, but because it forms them".<sup>4,5</sup> Prevalence of gallstone ranges from 10 to 20% in India.<sup>6</sup> It affects nearly 4.3% of the population.<sup>7</sup> Many alternative methods for treatment of gallstones have been developed but these have not been satisfactory so far. The first laparoscopic cholecystectomy was performed by Philippe Mouret in Lyon, France and has now become the most common laparoscopic surgery performed worldwide.<sup>8-10</sup> Since ages, cholecystectomy has been the gold standard surgical treatment of cholelithiasis. In 1992, the national institute of health (NIH) consensus development conference stated that lap cholecystectomy "provides safe and effective treatment for most patients with symptomatic gall stone disease."<sup>11</sup> It has improved

patient satisfaction in terms of early post-operative pain relief, need for post-operative analgesia, hospital stay, total cost. With this knowledge of advantages and disadvantages of laparoscopic cholecystectomy and open cholecystectomy in symptomatic cholelithiasis, further studies are necessary to provide conclusion as to which method is safer, cost effective and provides better patient satisfaction. The present study was carried out for this very purpose. Aim of the study was to make a comparison between laparoscopic cholecystectomy and open cholecystectomy in symptomatic cholelithiasis in respect to early ambulation, duration of surgery, time for tolerance of diet, post-operative discomfort and pain, period of hospitalization and cost effectiveness.

### MATERIALS AND METHODS

The charts of 150 consecutive admissions to the surgical wards of Rama Medical college Hospital Hapur, Uttar Pradesh from Jan 2017 to Jan 2018 were reviewed retrospectively. This study included all symptomatic patients in the age group of 11-70 years

diagnosed as cholelithiasis on ultrasonography and who underwent laparoscopic or open cholecystectomy for the same. Data from all patients were taken from a detailed clinical history. Physical examination was conducted according to a definite Performa. Patients were investigated by a complete blood count, urine examination, liver function tests, X-ray chest and abdominal ultrasonography. Laparoscopic cholecystectomy was feasible in 70% of patients presenting with symptomatic gallstones. All patients were operated under general anesthesia. Patient were informed and detailed about both the procedures. Informed consent was obtained from all the participants.

Patients of all ages and both sexes were included in the study. The major criterion for accepting patients for the study was the reasonable certainty that no other surgically correctable intraabdominal disease is present as suggested by clinical examination and /or upper GI endoscopy and /or abdominal ultrasound. Once diagnosed the patients were prepared for surgery if they were fit for general anesthesia. Patients with abnormal LFT or USG finding suggestive of choledocholithiasis were not included in the study. This study does not include those cases of gall bladder disease who did not turn up after admission in the hospital or who left the hospital with their full work up, Also, those cases of gall bladder disease were also excluded, who were either not admitted / refused admission or admitted in other department of our hospital for biliary complaint or other diseases with concomitant asymptomatic gall stone, during the same period as mentioned below. Other patients excluded from the study are current pregnancy, not fit for general anaesthesia, suspected carcinoma of gall bladder, pancreatitis, cholecystoenteric fistula patients with concurrent co-morbid condition e.g CNS and CVS disease.

The patients were evaluated for incidence of gall stones, male to female ratio, duration of surgery, complications during surgery, requirement of drain, postoperative complications, period of post-operative hospital stay and post-operative resumption of normal diet.

**RESULTS**

Most of the patients in the study were females (78%). Out of 800 operations, 150 cholecystectomies performed and out these 50 open cholecystectomy and 100 laparoscopic cholecystectomy were done. Laparoscopic operations performed in elective cases only. There were 83 females and 22 males in the group of patients who underwent laparoscopic surgery and 35 females and 10 males in the group who were treated with open surgery. The age of the patients ranged from 11 years to 70 years. Majority of the patients belonged to 41- 60 years age group.

In present study 150 patients were studied in which 100 patients undergo laparoscopic surgeries ang 50 patients undergo open. Mean age of the patients including both sexes was 40.92yrs. Mean age of the female patients who underwent laparoscopic cholecystectomy was 40.51 yrs. Mean age of the male patients who underwent laparoscopic cholecystectomy was 44.23 yrs.

Majority of patients have multiple stones i.e 31 and distended gallbladder i.e 23 respectively and single large stone only in 7 out of 105 patients undergoing laparoscopic cholecystectomy.

The mean operation time for Laparoscopic cholecystectomy was significantly shorter than for Open cholecystectomy. In present study, it is clear that time taken by majority of Lap surgeries

performed between 45 to 60 minutes (61%). The mean duration of operation for patients who had successful laparoscopic cholecystectomy was 52.24 minutes and that for those who had converted open cholecystectomy was 64.50 minutes indicating a slightly longer operative time for the converted procedure.

The mean post-operative hospital stay was 3.7 days after laparoscopic cholecystectomy and 5.46 days after open cholecystectomy. The time taken for completion of surgery was significantly longer in OC than LC. Duration of surgery for open cholecystectomy was 55-80 min (mean-72.4 min) while the same for laparoscopic cholecystectomy was 40-55 min (mean 44.7 min.).

Nausea and vomiting was present equally as a symptom in both the groups. The patients who had undergone Laparoscopic cholecystectomy experienced relief from pain earlier than those who underwent Open cholecystectomy. It was observed that mean duration of post-operative pain was 18.3 hrs in lap surgeries as compared to mean duration of 30.7 hrs in open surgeries patients. The time period of post-operative hospital stay was shorter in lap patients than in open cases. The mean period of post-operative hospital stay was 1.8 days in lap patients and 4.8 days in open surgeries. Around 35 patients require drain and 15 patients in lap and open surgeries. 70 patients in Lap surgeries does not require any drain management.

**Table 1: Showing Percentage of all surgeries**

| Type of Operation             | Number     | %           |
|-------------------------------|------------|-------------|
| Open Cholecystectomy          | 50         | 16%         |
| Lap Cholecystectomy           | 100        | 8%          |
| Other major operations        | 650        | 81.25%      |
| <b>Total major operations</b> | <b>800</b> | <b>100%</b> |

**Table 2: Showing sex distribution in both surgeries**

| SEX          | LC         | %          | OC        | %          |
|--------------|------------|------------|-----------|------------|
| Male         | 22         | 33%        | 10        | 6.6%       |
| Female       | 83         | 55.3%      | 35        | 23.3%      |
| <b>Total</b> | <b>105</b> | <b>70%</b> | <b>45</b> | <b>30%</b> |

LC: Lap cholecystectomy; OC: Open cholecystectomy

**Table 3: Age Distribution of Lap Surgeries**

| Age group    | No. of patients | %           |
|--------------|-----------------|-------------|
| 11-20        | 4               | 3.8%        |
| 21-30        | 19              | 18%         |
| 31-40        | 41              | 39%         |
| 41-50        | 24              | 22.8%       |
| 51-60        | 11              | 10.4%       |
| 61-70        | 6               | 5.7%        |
| <b>Total</b> | <b>105</b>      | <b>100%</b> |

**Table 4: Ultrasound findings in Lap Surgeries**

| Ultrasound findings             | Lap Cholecystectomy |
|---------------------------------|---------------------|
| Thickening of gall bladder wall | 12                  |
| Distended gall bladder          | 23                  |
| Contracted gall bladder         | 05                  |
| Single large stone              | 7                   |
| Multiple stone                  | 31                  |
| Biliary sludge                  | 12                  |
| Pericholecystic fluid           | 15                  |

**Table 5: Operative duration showing for both surgeries**

| Operative duration (in minutes) | No. of Patients for LC | No. of patients for OC |
|---------------------------------|------------------------|------------------------|
| 30-45                           | 15                     | 2                      |
| 45-60                           | 65                     | 5                      |
| 60-75                           | 10                     | 12                     |
| 75-90                           | 9                      | 23                     |
| > 90                            | 6                      | 3                      |
| <b>Total</b>                    | <b>105</b>             | <b>45</b>              |

**Table 6: Complications of both surgeries**

| Complications           | LC | OC |
|-------------------------|----|----|
| Nausea and vomiting     | 12 | 12 |
| Intraoperative bleeding | 4  | 2  |
| Fever                   | 2  | 4  |
| Pain abdomen            | 7  | 15 |
| Shoulder pain           | 4  | 0  |
| Pancreatitis            | 1  | 0  |
| Paralytic ileus         | 1  | 2  |
| Bile duct injury        | 0  | 0  |
| Wound Infection         | 1  | 5  |
| Death                   | 0  | 0  |

**Table 7: Drain requirement and mean days of removal**

| Nature of surgery | Drain Requirement (yes/no) with No. of patients | Day of removal (mean) |
|-------------------|---|-----------------------|
| LC                | Yes, 35   | 2.39                  |
| OC                | Yes, 15   | 5.59                  |

**Table 8: Length of hospital stay**

| Day of Discharge | No. of Pts of LC | No. of Pts of OC |
|------------------|------------------|------------------|
| 2 day            | 0                | 0                |
| 3 day            | 45               | 0                |
| 4 day            | 20               | 5                |
| 5 day            | 7                | 10               |
| 6 day            | 3                | 15               |
| 7 day            | 0                | 45               |
| <b>Total</b>     | <b>75</b>        | <b>75</b>        |

**DISCUSSION**

In 800 major operations performed in department of general surgery Rama medical college Hapur from Jan 2017 to Jan 2018 (operations of neurosurgery and plastic are not included). Table No. 1 shows out of 800 operations, 150 cholecystectomies performed and out these 100 were Lap and 50 were open cholecystectomy done. Laparoscopic operations performed in elective cases only. Table no. 2 shows 33% and 6.6% of total 150 patients are male patients operated in lap and open surgeries. Table No. 3 shows peak incidence of gall stone disease in lap surgeries in my study was in the 4<sup>th</sup> decade (39%) followed by 5<sup>th</sup> and 3<sup>rd</sup> decade (22.8% and 18%). The least number of cases were in the 2<sup>nd</sup> decade (3.8%). The youngest patient was of 13 year female and oldest one was of 68 years female. Tiwari et al (1982)<sup>12</sup> and Kapoor et al (1984) have reported a maximum incidence in of 37.7% of gall bladder disease in 4<sup>th</sup> decade of life. Gunn, Keddie and Fox (1973)<sup>13</sup> and Lygidakis (1981)<sup>14</sup> have

reported a peak incidence in 4<sup>th</sup> decade of life. Baig et al (2002)<sup>15</sup> also reported a maximum incidence in the 4<sup>th</sup> decade of life with mean age of patient was 38 years. In present study, the majority of the cases were females, with male to female ratio of 1:7.66. This incidence is vary slightly from various studies. Male to female ratio observed by various other authors were 1:2.63 by Kovalcik et al (1983), 1:5.4 by Verma and Shafique (1983).<sup>16</sup> In table no.4 majority of patients have multiple stones and distended gall bladder in 31 and 23 respectively out of 105 patients undergoing laparoscopic cholecystectomy. In the present study, 4 patients had undergone conversion to open cholecystectomy due to intraoperative bleeding either from cystic artery or from liver bed. It was the commonest cause for conversion to open cholecystectomy. It was not more than 50 ml.

Jaffary et al<sup>17</sup> in their study of 93 patients undergoing LC found a conversion rate of 7.53%, instrumental failure being the commonest cause and instruments that failed during surgery included insufflators, camera, monitor and clip applicator failure. The mean duration of operation for patients who had undergone successful laparoscopic cholecystectomy was 59.63 minutes. Table no. 7 shows drain was placed in 35 patients out of 105 successful laparoscopic cholecystectomy surgeries. Majority of patients had approximately 20 - 40 ml drainage. Drain was removed on an average of 3.4 day postoperatively. While in 2 converted cases drain was essentially placed to drain subhepatic area and drain removed on an average 3.8 post-operative day. The majority of patients (76%) undergone laparoscopic cholecystectomy had tolerated regular diet on an average 1st Post-Operative Day (76%). Duration of hospital stay in laparoscopic cholecystectomy was 4.68 days and for converted cases were of 7.5 days, indicating slightly shorter hospital stay in laparoscopic cholecystectomy. After laparoscopic cholecystectomy all the patient was ambulatory on day of surgery and return to full activity within 4 to 10 days. Table no 6 shows that majority of patients develop nausea and vomiting followed by pain abdomen and shoulder pain postoperatively after successful laparoscopic cholecystectomy.

**CONCLUSIONS**

Based on the data presented, we conclude that laparoscopic cholecystectomy is a safe surgical means of removing the gallbladder with resulting significantly decreased length of postoperative hospitalization, requirements for pain medication, and postoperative length of convalescence when compared to open cholecystectomy. As such laparoscopic cholecystectomy is the treatment of choice for symptomatic gallstones. Open cholecystectomy and laparoscopic cholecystectomy are two modalities of treatment offered to patients suffering from symptomatic gall stones. The present study was conducted with the aim of comparing open cholecystectomy and laparoscopic cholecystectomy as a treatment option.

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