

A Comparative Study between Open and Laparoscopic Cholecystectomy at AGMC and GBP Hospital, Agartala, Tripura

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Abstract

Background: The most popular laparoscopic procedure worldwide and the gold standard for the treatment of gall stones, laparoscopic cholecystectomy has transformed the way gall bladder disease is managed. The study's objective is to compare the Laparoscopic Cholecystectomy with the Open Cholecystectomy in terms of case selection, technical challenges, length of surgery, postoperative complications, postoperative hospital stay, morbidity & mortality, patient attitude after operation, operative costs, and overall costs.

Methods: In this comparative study conducted on 80 patients who admitted through Out-door department or in emergency as acute cholecystitis, 40 patients were admitted to Laparoscopic Cholecystectomy and the other 40 to traditional Open Cholecystectomy, at AGMC and GBP Hospital, Agartala, Tripura from January 2016 to December 2016. All patients were thoroughly assessed and necessary investigations carried out. The patients were randomly assigned to either one of the procedures. All the patients were examined and underwent routine blood investigations with LFT wherever necessary. Abdominal USG was performed in all the cases.

Results: The patient selection between the two groups did not differ significantly. Both groups did not experience any mortality, however the open treatment had greater problems than the laparoscopic one. Laparoscopic surgery results in reduced pain, shorter hospitalisation, early mobilisation, and an early return to work.

Conclusion: When it comes to outcomes, laparoscopic cholecystectomy is preferable than open cholecystectomy. As a result, it is advised to perform this procedure first.

Keywords: Cholelithiasis, Laparoscopic cholecystectomy, Open cholecystectomy

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Introduction

While a German surgeon named Carl August Langenbuch [1] performed the first open cholecystectomy in 1882, Philippe

Mouret, Qubios, and Persatt performed the first laparoscopic cholecystectomy in Lyon, France, in 1987.

Laparoscopic cholecystectomy [2] is the only surgical treatment to have had such a significant and pivotal impact on abdominal surgery. The most popular laparoscopic procedure worldwide, laparoscopic cholecystectomy has transformed the way gall bladder disease is treated and is currently the gold standard for the treatment of gall stones [3,4].

Although the rate of cholecystectomy is 20% higher with laparoscopic surgery than with open surgery, the reasons are the same [5]. There are significant benefits for patients in terms of pain, hospital stay, recovery time, expenses, and cosmetic outcomes. There have only been a few occasions in the history of surgical practise where the advantages of a technique become so clearly expressed within such a short period of time, according to Alfred Cuscheri [6,7]. We tried to compare the benefits and downsides of both methods in our study, which was conducted in an Indian setting.

Material and Methods

Present study was done in Department of Surgery at Agartala Govt. Medical College

Results

and GBP Hospital, Agartala, Tripura from January 2016 to December 2016.

There were 80 patients diagnosed with calculous cholecystitis who had cholecystectomy; 40 got laparoscopic surgery and the remaining 40 underwent open surgery. All patients underwent thorough evaluations, and all required tests were run. One of the two operations was chosen at random for the patients. Every patient got a physical examination and, if needed, routine blood tests with LFT.

In all of the instances, an abdominal USG was done. The study comprised patients with cholelithiasis confirmed by USG who were deemed suitable for elective cholecystectomy and had at least one episode of upper abdominal pain. Patients with CBD stones, those who had had abdominal surgery in the past, and those who were older than 70 years were excluded from this study.

Written informed consent was obtained from all the patients before their enrolment in the study

Table 1: Sex Distribution

Sex	Laparoscopic Cholecystectomy	Open Cholecystectomy
Male	10	20
Female	30	20

Table 2: Age Distribution

Age in years	Laparoscopic Cholecystectomy	Open Cholecystectomy
< 30	8	4
31 – 40	16	8
41 – 50	10	12
51 – 60	6	12
61 – 70	0	4

Table 3: Presenting complaints

Complaints	Laparoscopic Cholecystectomy	Open Cholecystectomy
Pain RUQ	40	40
Vomiting	14	12
Fever	10	8
Dyspepsia	8	8
Similar history	20	16

Table 4: Sonographic findings

USG Findings	Laparoscopic Cholecystectomy	Open Cholecystectomy
Solitary stone	10	12
Multiple stones	30	28
Pericholecystic fluid	6	10

Table 5: Operative findings

Operative findings	Laparoscopic Cholecystectomy	Open Cholecystectomy	p Value
Operating time (in min) (range)	105 (60-160)	70 (40-135)	p=0.001* (S)
Blood loss <100 ml. >100 ml.	36 4	30 10	p>0.05* (NS)
Complications Bile leak Stone spillage CBD Injury Adj. Organ injury	16 6 0 2	8 2 0 2	p>0.05* (NS)
Drains used	34	38	p> 0.05* (NS)
Conversion	4	--	

For OC and LC, the median length of the surgical procedure was 70 minutes (ranging from 40 to 135 minutes). It was determined that the difference was significant ($p=0.001$). Due to an intraoperative gas leak, Calot's triangle dissection, clip slippage, and gall bladder delivery through the port site, LC took longer than expected.

The two primary side effects were stone spillage and bile leak (16 patients in the LC group and 8 patients in the OC group, respectively) (6 in LC and 2 in OC). In neither group was there a case of CBD harm. In 2 of the patients who had OC, the liver was injured during retraction.

In 38 patients in the OC group and 34 patients in the LC group, sub-hepatic drains were necessary. Occasionally, drains weren't maintained.

Two patients were converted from laparoscopy to open surgery due to:

1. Slippage of the clip applied to the cystic artery.
2. Dense adhesions in the Calot's triangle in a case of acute cholecystitis.

Table 6

Laparoscopic Cholecystectomy		Open Cholecystectomy	p Value*
VAS (Grades 0-5) (Range)	Grade 2 (0-3)	Grade 3 (1-5)	p=0.024 (S)
Duration of pain (days) (Range)	2 (1-6)	4 (2-10)	p=0.001 (S)
Analgesic used for (days) (Range)	3 (2-6)	5 (2-10)	p=0.016 (S)

In comparison to the LC group, the VAS for the OC group had a median grade of 3, with a p-value of 0.024. Both groups experienced increased discomfort during the first two days, and in the OC group, it persisted for a median of four days as opposed to two in the LC group, with a p-value of 0.001.

In the OC group, NSAIDs were used for longer (median-5 days) than in the LC group (median-3 days), p=0.016.

Table 7: Post operative outcome and antibiotics used

Post operative outcome	Laparoscopic Cholecystectomy	Open Cholecystectomy	p Value*
Wound infection	38	30	p>0.05 (NS)
Nil			
Moderate Severe	2 0	6 4	
Duration of Antibiotics used in days (Range)	5 (3-7)	7 (5-14)	p=0.1 (NS)
Incisional hernia	0	1	

Wound infection rates varied, with 10 patients in the OC group and just 2 in the LC group (p>0.05). Two patients in the OC group required later anesthesia-induced sutures due to wound dehiscence. As a result, the OC group received antibiotics for 7 days as opposed to the LC group's 5 days. At 6 months after OC, one patient experienced an incisional hernia that was treated with onlay mesh repair. In the OC group, drains were left in for an average of 3 days as opposed to 2 days in the LC group. Once the drainage reached 10 ml in 24 hours, they were taken out.

Table 8: Post-operative recovery

Post operative recovery	Laparoscopic Cholecystectomy	Open Cholecystectomy	p Value*
Time taken to return of bowel sounds (in hours)*	9 (6-12)	21 (12-30)	p=0.21 (NS)
Time to resumption of oral feeds (in hours)*	9 (6-18)	21 (12-36)	p=0.345 (NS)
Duration of hospital stay (in days)*	4 (2-7)	7 (4-10)	p=0.001 (S)
Time taken to return to normal work (in days)*	5 (3-10)	8 (5-14)	p=0.018 (S)

Patients in the LC group began oral feedings on average at 9 hours (6-8 hours), whereas it took an average of 21 hours for patients in the OC group (12-36 hours).

The median length of hospitalisation was 4 days (2–7 days) for the LC group and 7 days (4–10 days) for the OC group. Statistically speaking, the difference was substantial ($p=0.001$). Due to increased pain, a wound infection, the use of injectable antibiotics, and reduced mobilisation because of discomfort, it was more prevalent in the OC group.

In comparison to the OC group, all patients who received LC were able to resume their regular employment in an average of 5 days as opposed to 8 days. The difference was statistically significant, $p=0.018$.

Table 9: Cosmetic

Cosmetic result	Laparoscopic Cholecystectomy	Open Cholecystectomy
Unacceptable	0	28
Acceptable	8	12
Good	32	0

Only 12 patients in the open group were satisfied with the cosmetic outcome, compared to 32 patients who received LC, $p>0.05$.

The incisional scar in the open group measured between 5 and 10 cm in length and had a noticeable, thick scar.

Table 10: Cost analysis

Cost in Rs.	Laparoscopic Cholecystectomy	Open Cholecystectomy
< 3000	4	16
3000-6000	28	16
>6000	8	8

LC was costlier compared to the cost of the open procedure. (Average of Rs.4070 in OC group compared to Rs.4642.50 in LC group; $p>0.05$). The cost in the LC group was more due to its increased operative costs. The difference was not found to be statistically significant.

Discussion

According to Carl Langenbuch, the gall bladder should be removed because it causes stones rather than because it already contains any. Both laparoscopic and open procedures aim to safely remove the gall bladder with minimal morbidity, mortality, and recovery time [8]. A minimally invasive operation called a laparoscopic cholecystectomy removes the gall bladder

with a laparoscope. The same criteria apply as for open cholecystectomy.

A successful outcome depends on selecting the right patients, using exacting technique, and having a favourable outlook regarding conversion to open cholecystectomy. If one has had enough open biliary surgery experience and extra training in laparoscopic surgery, laparoscopic method is challenging to perfect. Before doing such an operation, it is crucial to be completely familiar with the tools and procedure. For laparoscopic cholecystectomy, training credentials and clinical privileges must be granted [9].

Due to advancements in techniques and devices that enable laparoscopic exploration of the common bile duct, the majority of the once-absolute contraindications for

laparoscopic surgery are now considered to be relative. The surgeon's experience, as well as the pre- and post-operative circumstances, influence the contraindications. Insufficient anaesthetic risks, trouble detecting structures in the portal area, and Calot's triangle are the main contraindications [10].

The anterior abdominal wall is often punctured four or five times during laparoscopic cholecystectomy procedures. In the subsequent examples of the series, we changed our strategy to the three ports technique. Both traction of Hartman's pouch and splaying the Calot's triangle are accomplished using the 5mm port. We were still able to successfully perform dissection despite the three ports. There were three conversions in this study. One patient had to undergo an open cholecystectomy when the clip holding it to the cystic artery broke off, causing severe bleeding. A T-tube was inserted to treat biliary leakage caused by a common hepatic duct damage in the second patient. The third instance was an open, sloughed-off cystic duct stump. The complications that occur with laparoscopic cholecystectomy may occur with open cholecystectomy also, but their frequency vary [11].

Hemorrhage, bile duct injury, overlooked common bile duct stones, bile leak, perihepatic collection, and infection are a few examples of such complications [12]. Although we did not do any intra-operative cholangiography, the use of this procedure during cholecystectomy is debatable. While performing a laparoscopic cholecystectomy, it has been observed that routinely using intra-operative cholangiography lowers the incidence, degree, and severity of bile duct damage. Haemostasis and dissection were performed using electrocautery. It is quicker and more cost-effective; although lasers can be employed, the cost of the procedure will increase [13].

Conclusion

A significant improvement in the management of gall bladder disease is laparoscopic cholecystectomy. Laparoscopic cholecystectomy has benefits in various different areas. Technically, the cystic artery and cystic duct are precisely dissected, and bleeding is easily managed with minimal postoperative blood loss. There is no risk of wound dehiscence and there are fewer risks of wound infection with LC. Comparatively less antibiotics are used in LC than OC. Shorter post-operative pain is experienced, and it lasts less time. Less analgesic medication is needed in LC. Patients with LC tolerate oral feeds more quickly and move around more quickly. Patients can leave the hospital more promptly and with a shorter hospital stay. The LC group's patients can be immediately released from the hospital. Patients in the LC group can start working sooner. The benefit of LC for appearances is clear. A large financial saving for the patient is a result of LC. The lengthier operating time of the laparoscopic cholecystectomy compared to the open operation is its only drawback.

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