SAS Journal of Surgery ISSN 2454-5104
SAS J. Surg., Volume-1; Issue-3 (Sep-Oct, 2015); p-140-145
Available online at http://sassociety.com/sasjs/

Research Article

A Comparative Study between Laparoscopic and Open Cholecystectomy with Early Post-Operative Course and Complication

Dr. Manojith S.S[1], Dr. E. Muniswamy Gattu[2], Dr. Sridar Venkat Rao[3]

[1]Post Graduate, Department of General Surgery, Navodaya Medical College Hospital & Research Centre, Raichur - 584103.

[2]Associate Professor, Navodaya Medical College Hospital & Research Centre, Raichur, Karnataka, India - 584103

[3]Professor, Navodaya Medical College Hospital & Research Centre, Raichur, Karnataka, India – 584103

***Corresponding author**
Dr. Manojith S.S
Email: ramspsm@gmail.com

Abstract: Laparoscopic cholecystectomy has rapidly become established as the popular alternative to open cholecystectomy, but it should have a safety profile similar to or better than that of open procedure. The aim of this study was to compare conventional cholecystectomy with respect to duration of procedure, early postoperative course and complication, postoperative pain, analgesic requirement and period of hospital stay. 40 consecutive patients below 70 years presenting with calculouscholecystitis with no evidence of CBD stones were randomized to undergo open and laparoscopic cholecystectomy. Data was collected and analyzed. The two groups were similar with respect to demographic and clinical charecteristics. There were no significant differences in the rate of complications and blood loss. Median duration of pain was 1 day with Visual Analogue scale for pain of grade 2 in Laparoscopic group ,while it was 4 days and grade 3 in open group respectively .The median duration of hospital stay was significantly shorter in Laparoscopic group (median 4 v/s 7 days in OC group). The main advantages of LC were the reduced post operative pain with less duration of analgesia intake, more rapid recovery and reduced hospital stay.

Keywords: cholethiasis; laparoscopic cholecystectomy; open cholecystectomy; post operative pain

INTRODUCTION

The concept of "key hole surgery" created an immediate disparity between the potential of the new technique and training of surgeons to perform it. Now modern surgical methods are aimed at giving cure along with minimal invasive techniques with patient in mind, safety never being compromised[1].

Cholithiasis, which continues to be one of the most common digestive disorders encountered, was traditionally being dealt by conventional or open cholecystectomy with the introduction of laparoscopic cholecystectomy, the surgical community witnessed a revolution in basic ideology and the importance of minimal access surgery has suddenly impacted[2,3].

Compared with open cholecystectomy, laparoscopic cholecystectomy has significantly decreased the length of hospital stay (can be done as a day procedure), postoperative pain, and recovery time. However, there has been an increased incidence of major bile duct injuries since its inception[2,4]. Although LC has shown clear benefits in terms of shortened hospital stay, less morbidity, mortality, a quicker return to work and with cosmetic advantage, many questions regarding this procedure remain unanswered, particularly relative to the gold standard procedure of open cholecystectomy[5].

Aims and objectives

The aim of this study is to compare conventional cholecystectomy and laparoscopic cholecystectomy with respect to duration of the procedure., blood loss during surgery, early post-operative period (first 48 hours) and to recognize the special problems arising during this period, antibiotic and analgesic requirement, complications encountered (early post-operative and delayed) and patients satisfaction.

MATERIALS AND METHODS

The study subjects consisted of 40 patients with a diagnosis of calculouscholecystitis that underwent cholecystectomy at Navodaya Medical College Hospital and Research Centre, Raichur.

Inclusion Criteria were included patients with cholelithiasis proven by USG with at least one attack of upper abdominal pain and considered fit for elective cholecystectomy were included in the study, mucocele / pycocele of gall bladder and porcelein gall bladder. The patients with following conditions were excluded from

the study i.e history or investigations suggesting CBD stones, generalized peritonitis, history of prior abdominal surgery, patient's age above 70 years, pregnancy, major bleeding disorder and suspected carcinoma gall bladder. Lap converted to open cholecystectomy since it is randomized prospective study.

OBSERVATIONS AND RESULTS

Twenty patients were randomized to each group. The results were,

Patients demographics

Sex distribution

10 patients of OC and 5 patients of LC were males. Among OC group 10 were females and among LC group 15 were females (Table-1).

Age distribution

The median age (range) of patients were 38 (18-62) and 40(20-65) years in LC and OC groups respectively. The difference was not found to be found to be statistically significant.(Table-2).

Presenting complaints

All patients in both the groups [20 (100%)] presented with pain in the right upper quadrant. The other complaints seen were fever (4 in OC and 5 LC), vomiting (6 in OC and 7 in LC) and dyspepsia (4 each in OC and LC). None of the patients had jaundice or previous history of jaundice. 8 patients in OC and 10 patients in LC group had similar history of pain abdomen in the past (Table-3).

Sonographic findings

All patients in both the groups underwent abdominal sonography. Solitary stone was found in 6 patients of OC group and 5 patients of LC group. Multiple stones were seen in 14 and 15 patients of OC and LC group respectively. 5 patients in OC group and 3 patients in LC group had peri-cholecycstic fluid collection suggestive of acute cholecystitis. The difference was not found to be significant (Tabble-4).

Table-1: Sex distribution

Sex	LC	OC
Male	5	10
Female	15	10

Table-2: Age distribution

Age in years	LC	OC
< 30	3	2
31 - 40	6	7
41 - 50	5	4
51 – 60	4	5
61 – 70	1	3

P value > 0.025
(Chi Square test)

Table-3: Presenting complaints

Complaints	LC	OC
Pain RUQ	20	20
Vomiting	7	6
Fever	5	4
Dyspepsia	4	4
Similar history	10	8

P value > 0.05
(Chi Square test)

Table-4: Sonographic findings

USG Findings	LC	OC
Solitary stone	5	6
Multiple stones	15	14
Pericholecystic fluid	3	5

P value > 0.05
(Chi Square test)

Operative findings

All patients were operated under general anaesthesia. The intra operative blood loss was < 100 ml in 15 patients and > 100 ml in 5 patients who underwent OC and was < 100 ml in 18 patients and > 100 ml in 2 patients who underwent LC (Table-5).The main reason for blood loss in LC group was the slippage of the clip applied to the cystic artery and from the gall bladder bed .

The median duration of operative procedure was 70min (40-13 5min) for OC and 105min (60-160min) for LC. The difference was found to be significant (p=0.001).The more time required in LC was due to intra- operative gas leak, Calot's triangle dissection, slippage of clip and delivery of gall bladder through the port site.

The main complications noted were bile leak (8 patients in LC and 4 patients in OC group) and stone spillage (3 in LC and 1 in OC). There was no instance of CBD injury in either group. Injury to liver during retraction was seen in 1 patient who underwent OC.

The sub-hepatic drains were required in 19 patients in OC group and 17 patients in LC group. In other cases, drains were not kept as the haemostasis was found to be adequate.

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

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

Table-5: Operative findings

Operative findings	**LC**	**OC**	**P value**
Operating time (in min) (range)	105 (60-160)	70 (40-135)	p=0.001* (S)
Blood loss < 100 ml >100 ml	 18 2	 15 5	p=0.05^{+} (NS)
Complications Bile leak Stone spillage CBD Injury Adj. Organ injury	 8 3 0 1	 4 1 0 1	P=0.05^{+} (NS)
Drains used	17	19	P=0.05^{+} (NS)

*Wilcoxon rank sum test

$^{+}$Chi square test

Early post-operative period (first 48 hours)

In the LC group, the average pain score in the first 24 hr was 1 and in the second 24 hr it was zero. In open group, the score was 3 and 2 respectively. Early nausea was present in 80% of patients in LC group versus 90% in open group(Table-6).

All patients with LC pass flatus and start mobilization on day zero, while patients who had OC puss flatus and start moving after 24 hr. all patients with LC were given analgesic on day zero only(Tramadol). Tramadol & Diclofenac were given to all patients with OC in day 0 and…to 50% of patients on day 1 and 25% on day 2. Early cough with chest pain was present in 2 (10% with LC and in 4 patients (20%) with OC. Patient with LC needed admission and intensive care unit and two in the OC group.

Table 6: Early post-operative period

		LC	**OC**
Pain score (Average)	1st 14 hr	1	3
	2nd 24 hr	0	2
Nausea		16 (80%)	18 (90%)
Flatus		Day 0	Day 1
Mobility		Day 0	Day 2
Cough & chest pain		2 (10%)	4 (20%)
Analgesic used Average		Tramadol (Day zero)	Tramadol &Diclofenac (Day zero) (100%), (Day 1) (50%), (Day 2) (25%)

Pain score and medication

The VAS was median Grade3 in OC group as compared to median Grade2 in LC group, p=0.024. The pain was more in the initial 2 days in both groups and it lasted for median duration of 4 days in OC group compared to 2 days in LC group, p=0.001 (Table-7).

The NSAID's were used for more days in OC group (median-5days) compared to LC group (median-3days), p=0.0l6.

Table-7: Pain score and medication

	LC	OC	P value
VAS (Grades 0-5) (Range)	Grade 2 (0-3)	Grade 3 (1-5)	P=0.024 (S)
Duration of pain (days) (Range)	1 (1-6)	4 (2-10)	P=0.001 (S)
Analgesic used for (days) (Range)	3 (2-6)	5 (2-10)	P=0.016 (S)

* Wilcoxon rank sum test

Early postoperative complications

Table 8: Early postoperative complications

	LC	OC
Delayed recovery	1	2
Need for ICU/RCU	1	2
DVT	0	0
Pulmonary embolism	0	0
Early jaundice	0	0
Wound infection	1	5
Bile leak	8	4

Specific complication - Hemorrhage

Table-9: Specific complication - Hemorrhage

Site	LC	OC	P value*
Organ (liver)	1	1	p=0.05 (NS)
Trocar site	0	0	p=0.05 (NS)
Vascular	0	0	p=0.05 (NS)

Specific complication

Table-10: Specific complication

		LC	OC
Biliary complication	Common bile duct injury	0	0
	Post operative bile leak	2	1
Bowel injury	Caused veress needle	0	0
	During dissection	0	0
Spillage of gall stones		3	1

No patient with LC and OC had venous thrombosis with embolism. Delayed recovery from anaesthesia voted in one patient with LC and two patients with OC and no patient had early jaundice. There was one patient had wound infection in LC and five patients with OC had wound infection.

There were no specific complication with trocar site and vascular injury, on patient had organ (liver) injury in LC and one patient in OC.

In the LC and OC there were no common bile duct injuries. Two patients with LC and one patient with OC noted with post operative bile leak.

No patient with LC and OC had bowel injury and its related complication.

There was spillage of gall stones in three patients in LC and one patient in OC.

Post operative outcome and antibodies used

Table-11: Post operative outcome and antibodies used

Post operative outcome	LC	OC	p Value*
Wound infection Nil Moderate Severe	 19 1 0	 15 3 2	 p>0.05 (NS)
Duration of Antibiotics used in days (Range)	5 (3-7)	7 (5-14)	P=0.l (NS)
Incisional hernia	0	1	

* Wilcoxon rank sum test

There was difference in wound infection rate, 5 patients in OC group compared to only 1 patient in LC group, p>0.05. One patient in OC group had wound dehiscence which was sutured later under anaesthesia.

Due to this, the antibiotics were used for 7 days in OC group compared to 5 days in LC group.

One patient who underwent OC developed incisional hernia at 6 months follow up which was repaired by onlay mesh repair.

The drains were kept for an average of 3 days in OC group compared to 2 days in LC group. They were removed once the drainage was <10 ml in 24 hours.

Post operative recovery

Table-12: Post operative recovery

Post operative recovery	LC	OC	P Value*
Time taken to return of bowel sounds (in hours)$^{+}$	9 (6-12)	21 (12-30)	P=0.2l (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)

$^{+}$Values are in median (range)

* Wilcoxon rank sum test

The LC group patients were started on oral feeds at an average of 9 hours (6-8 hours) while in OC group patients it took an average of 2l hours (12-36 hours).

The duration of hospital stay was for a median period of 4 days (2-7days) in LC group and 7 days (4-l0 days) in OC group. The difference was statistically significant, p=0.001. It was more in OC group due to increased pain, wound infection, injectable antibiotics used and less mobilization due to pain.

All patients who underwent LC were able to return to normal work on an average of 5 days compared 8 days in OC group. The difference was statistically significant, p=0.0l8.

Cosmesis

Table-13: Cosmesis

Cosmetic result	LC	OC
Unacceptable	0	14
Acceptable	4	6
Good	16	0

p value > 0.05(NS)
(Chi Square test)

16 patients who underwent LC felt that they had a good cosmetic end result while only 6 patients of open group acceptable, p>0.05.

The length of the incisional scar in open group ranged from 5-10 cm and was visible as a thick scar.

CONCLUSION

Laparoscopic cholecystectomy is a considerable advancement in the treatment of gall bladder disease. The advantages of laparoscopic cholecystectomy are the dissection of the cystic artery and cystic duct is very precise and bleeding is easily controlled with less peri operative blood loss, LC is associated with less chances of wound infection and there is no risk of wound dehiscence, antibiotic usage in LC is comparatively lesser than that of OC, degree of post operative pain and its duration is less, amount of analgesic requirement is less in LC, LC patients tolerate oral feeds earlier and are mobilized faster, duration of hospital stay is less and patients can be discharged quickly from the hospital, patients of LC group can resume their work earlier and cosmetic advantage in LC is obvious.

The only disadvantage of the laparoscopic cholecystectomy over the open procedure is the duration of operating time which is significantly longer.

REFRENCES

1. Ahmad ., O'Flynn H, Duffy JM, Phillips K, Watson A; Laparoscopic entry techniques. Cochrane Database Syst Rev, 2012; 2.
2. Berggren U, Gordh T, Grama D, Haglund U, Rastad J, Arvidsson D; Laparoscopic versus open cholecystectomy: hospitalization, sick leave, analgesia and trauma responses. British journal of surgery, 1994; 81(9):1362-1365.
3. Schirmer BD, Edge SB, Dix JT, Hyser MJ, Hanks JB, Jones RS; Laparoscopic cholecystectomy. Treatment of choice for symptomatic cholelithiasis. Annals of surgery, 1991; 213(6):665.
4. Grupta V, Chowdri N, Wani NA, Naqash S; Lap v/s open cholecystectomy: a prospective study of 800 patients. JK Science, 2009; 11(1): 11-15.
5. Soper NJ, Stockmann PT, Dunnegan DL, Ashley SW; Laparoscopic Cholecystectomy The New' Gold Standard'?. Archives of surgery, 1992;127(8):917-923.