ORIGINAL ARTICLE

Comparison of Postoperative Morbidity in Open and Laparoscopic Cholecystectomy - a study at Department of Surgery Services Hospital, Lahore

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ABSTRACT

Objective: To compare the post operative morbidity associated with open and laparoscopic cholecystectomy.

Materials and methods: One hundred and twenty patients of gallstone disease diagnosed on ultrasound were included in the study. They were divided into two groups.

Results: Mean age of the patients was 38.6±6.7 in group A and 38.4±5.7 in group B. Regarding hospital stay, mean hospital stay was 3.7±0.7 in group A as compared to 1.7±0.5 in group B. P value < 0.001. Regarding gall stone number, solitary stone was present in 12(20%) in open cholecystectomy group and in 14(23.3%) patients in laparoscopic cholecystectomy group. 2-4 stones were present in 20 (33.3%) patients in group A, where as in 16(26.6%) in group B. More than 5 stones were present in 28(46.7%) patients in group A and 30(50%) patients in group B. Post operative pain and post operative infection were lower in laparoscopic group as compared to open cholecystectomy group.

Conclusion: Although both techniques i.e., laparoscopic and open cholecystectomy are fairly efficient in treating patients with gall stone diseases but laparoscopic cholecystectomy is found to be more reliable with lesser complication rate and shorter hospital stay.

Keywords: Gallbladder, open cholecystectomy, laparoscopic cholecystectomy.

INTRODUCTION

Gallstone disease remains one of the most common medical problems leading to surgical intervention. Every year, approximately 500,000 cholecystectomies are performed in the US. Cholelithiasis affects approximately 10% of the adult population in the United States. It has been well demonstrated that the presence of gallstones increases with age. An estimated 20% of adults over 40 years of age and 30% of those over age 70 have biliary calculi. During the reproductive years, the female-to-male ratio is about 4:1, with the sex discrepancy narrowing in the older population to near equality. The risk factors predisposing to gallstone formation include obesity, diabetes mellitus, estrogen and pregnancy, hemolytic diseases, and cirrhosis[1].

Cholecystectomy, the removal of gall bladder, is one of the most commonly performed operations in the world. First open cholecystectomy was done by Carl August Langenbuch in 1882[2].

First laparoscopic cholecystectomy was done by Philippe Mourtre in 1987 and in Pakistan it was done in 1991[3].

Gallstone is the most common cause of cholecystitis. Patients present with recurrent attacks of epigastric or right hypochondrial pain, nausea, vomiting, indigestion, dyspepsia, flatulence, intolerance to fatty food, abdominal distension and belching[4].

Gall stones are diagnosed by ultrasonotraphy, computer tomography and magnetic resonance imaging[5,6,7].

Cholecystectomy for the management of gallstone disease is feasible and achievable by open and laparoscopic route[8,9]. Surgery for gallstones may be associated with post operative complications like pain, nausea, vomiting and/or wound infection[10,11].

Laparoscopic cholecystectomy is the gold standard for the treatment of gall bladder disease; nevertheless in developing countries open cholecystectomy is still done frequently[12].

The introduction of laparoscopic technique to general surgery has dramatically changed the view to the postoperative course of patients after cholecystectomy[13].

Laparoscopic cholecystectomy has proven to reduce the postoperative pain significantly and thus allow a shorter hospital stay and recovery period, which is reflected in patients earlier return to normal life and work activities[14]. In most of the centers, patients are discharged home on the first postoperative day. However, as experience expands further, few series have recently shown that the

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operation is safe and feasible even as an outpatient procedure in properly selected patients[15].

Thus, pain relief and patient comfort during the early postoperative period becomes increasingly important, as the need for analgesic may delay discharge. Through this study, I want to compare two surgical techniques in order to minimize hospital stay of the patients of gallstone disease after surgery and improve post-operative complications in such patients by adopting better surgical options in future.

METHODS AND MATERIALS

A Quasi-experimental study was conducted in the Department of Surgery, Services Hospital, Lahore, over a period of One year. A total of 120 patients of gallstone disease diagnosed on abdominal ultrasound were included in the study. They were divided into two groups by using random number table group A and group B, 60 patients in each group.

Non-probability convenient sampling was used to identify females above the age of 20 years with gall stones. Patients with previous history of abdominal surgery, diabetes mellitus, common bile duct stones and chronic ailments were excluded form the sample.

Group A underwent open cholecystectomy while laparoscopic cholecystectomy was done in group B. Both groups were given same kind and dose of anesthesia. Surgical notes were maintained. They were followed up for next 5 days to see the complications like postoperative pain and wound infection. All patients were monitored closely after 6 hours, 12 hours, 18 hours and 24 hours for post operative pain and on 1st, 3rd and 5th day for wound infection and hospital stay.

Data analysis was computer based. SPSS version 10 was used for analysis. Variables of interest were hospital stay, pain relief and wound infection. Numerical variables i.e., age and hospital stay were calculated as mean±SD. Frequencies and percentage were used for categorical variables i.e. pain and wound infection. Numerical variables i.e. hospital stay was measured and compared in both groups by applying t-test. Qualitative variables like pain and wound infection were compared by applying chi-square test. P value ≤0.05 was significant.

RESULTS

Purpose of study was to compare postoperative morbidity in open and laparoscopic cholecystectomy. 120 patients were divided into two groups, group A and group B, with there being 60 patients in each group. Distribution of cases by age showed 14(23.3%) patients between 27-32 years in group A and 10 (16.6%) patients in this range were present in group B. 8(13.3%) patients between 33-37 years of age in group A, whereas 18(30%) patients in group B. there were 24(40%) patients between 38-48 years of age in group A while 22(36.7%) patients of this age group were in group B. 8(13.3%) patients between 43-47 years of age were present in group A while 4(6.7%) patients in group B. 4(6.7%)patients between 48-53 years belonged to group A whereas 6(10%) fell in group B. there were only 2(3.3%) patients who belonged to the age group ≥54 years in group A while no patient of this age group was present in group B. mean age was 38.6±6.7 in group A and 38.4±5.7 in group B.

In this study patients had different modes of presentation. In group A, 46 patients presented with right hypochondrium pain, 16 patients with vomiting, 54 patients with dyspepsia, and tenderness of the right hypochondrium was present in 52 patients. In the laparoscopic cholecystectomy group, 46 patients presented with pain RHC, 14 patients with vomiting, and 50 patients with tenderness in the right hypochondrium (Table 1).

Regarding gallstone number, solitary stone was present in 12(20%) in open cholecystectomy group and in 14(23.3%) in laparoscopic cholecystectomy group. 2-4 stones were present in 20(33.3%) patients in group A, whereas in 16(26.6%) patients in group B. ≥5 stones were present in 28(46.7%) patients in group A and 30(50%) patients in group B (Table 1).

On examination, mean pulse rate was 82.0±5.3 in group A and 81.9±5.3 in group B. Mean systolic B.P. was 129.3±11.7 in group A and 130.0±8.9 in group B. mean diastolic B.P. was 81.0±8.4 in group a and 84.0±5.6 in group B. Mean temperature was 98.2±0.4 in both groups. Mean respiratory rate was 15.2±1.2 in group A and 19.9±1.2 in group B. Regarding investigations; mean value for hemoglobin was 11.9±1.0 for both groups. Bilirubin was 0.81±0.1 in group A and 0.82±0.14 in group B. mean value of SGOT was 39.3±2.5 in group A while 38.5±4.1 in group B. SGPT was 40.3±2.7 in group A and 39.5±3.5 in group B. Alkaline phosphatase was 134.2±10.6 in open cholecystectomy group while it was 133.7±9.3 in laparoscopic cholecystectomy group (Table 1).

Regarding pain score at 6 hours post operatively 14(23.3%) patients in group A and 34 (56.7%) patients in group B had mild pain. Moderate pain was present in 32(53.3%) patients in group A while in 4(6.7%) patients in group B. 14(23.3%) patients in group A had severe pain while 22(36.7%) patients in group B experienced no pain at all (Table 1).

Pain score at 12 hours post operatively was charted in both groups. 8(13.3%) patients in group A and 40(66.7%) patients in group B had mild pain.

Moderate pain was present in 34(56.7%) patients in group A while in 12(20.7%) patients in group B. 18(30%) patients in group A had severe pain while 8(1.37%) patients in group B experienced no pain at all (Table 1).

At 18 hours post operatively, 12(20%) patients in group A and 30 (50.0%) patients in group B had mild pain. Moderate pain was present in 30(50%) patients in group A and in 12(20%) patients in group B. 18(30%) patients in group A and 4(6.7%) in group B had severe pain (Table 1).

At 24 hours post operatively 24(40%) patients in group A and 16(26.7%) patients in group B had mild pain. Moderate pain was present in 24(46.7%) patients in group A and in 10(16.7%) patients in group B. 8(13.3%) patients in group A and 2(3.3%) patients in group B had severe pain while 32(53.3%) patients in group B experienced no pain at all (Table 1).

On 1st post operative day, 4(6.7%) patients in group A had wound infection whereas no patients in group B had wound infection (Table 9). On 3rd post operative day 10(16.7%) patients in group A and 2(3.3%) patients in group B had wound infection (Table 10). On 5th post operative day, 16 (26.7%) patients in group A and no patient in group B had wound infection (Table 1).

Regarding hospital stay, mean hospital stay was 3.7±0.7 days in group A as compared to 1.7±0.5 days in group B (Table 1).

Open Cholicystectomy VS Laparoscopic Cholicystectomy

Symptoms	**Open Cholicystectomy**				**Laparoscopic Cholicystectomy**			
Pain RHC	46 (76.7)				46 (76.7)			
Vomiting	16 (26.7)				14 (23.3)			
Dyspepsia	54 (90.0)				50 (83.3)			
Tender RHC	52 (86.7)				50 (83.3)			
Gall Stones	Open Cholicystectomy				Laparoscopic Cholicystectomy			
1	12 (20.0)				14 (23.3)			
2 – 4	20 (33.3)				16 (26.6)			
≥5	28 (46.7)				30 (50.0)			
Variables	Open Cholicystectomy				Laparoscopic Cholicystectomy			
	Mean±SD				Mean±SD			
Pulse	82.0±5.3				81.9±5.3			
Systolic BP	129.3±11.7				130.0±8.9			
Diastolic BP	81.9±8.4				84.0±5.6			
Temperature	98.2±0.4				98.2±0.4			
Resp. Rate	15.2±1.2				19.9±1.2			
Hb %	11.9±1.0				11.9±1.0			
Bilirubin	0.81±0.11				0.82±0.14			
sGOT	339.3±3.5				38.5±4.1			
sGPT	40.3±2.7				39.5±3.5			
Alk. Phosp.	134.2±10.6				133.7±9.3			
Pain	Open Cholicystectomy				Laparoscopic Cholicystectomy			
	6 hrs	12 hrs	18 hours	24 hrs	6 hrs	12 hrs	18 hrs	24 hrs
No Pain	-	-	-	-	22 (36.7)	8 (13.3)	14 (23.3)	32 (53.3)
Mild Pain	14(23.3)	08 (13.3)	12 (20.0)	24(40)	34 (56.7)	40 (66.7)	30 (50.0)	16 (26.7)
Moderate Pain	32(53.3)	34 (56.7)	30 (50.0)	28(46.7)	04 (06.7)	12 (20.7)	12 (20.7)	10 (16.7)
Severe Pain	14(23.3)	18 (30.0)	18 (30.0)	08(13.3)	-	-	04 (06.7)	02 (03.3)
Wound Infections	Open Cholicystectomy				Laparoscopic Cholicystectomy			
	1st Day	3rd Day	5th Day		1st Day	3rd Day	5th Day	
Yes	04 (06.7)	10 (16.7)	16 (26.7)		-	02 (03.3)	-	
No	56 (93.3)	50 (83.3)	44 (73.3)		60 (100)	58 (96.7)	60 (100)	
Hosp. Stay	Open Cholicystectomy				Laparoscopic Cholicystectomy			
Day 1	-				20 (33.3)			
Day 2	-				38 (63.3)			
Day 3	24 (40.0)				02 (03.3)			
Day 4	24 (40.0)				-			
Day 5	12 (20.0)				-			

DISCUSSION

Gall stone disease remains one of the most common medical problems leading to surgical intervention. The risk factors predisposing to gallstone formation include female sex, obesity, diabetes, estrogen and pregnancy, hemolytic diseases and cirrhosis. During the last two decades, the general principile of gallstone management have not notably changed. However, methods of treatment have dramatically altered[16]. Cholecystectomy is the removal of gallbladder and is mainly performed for symptomatic gallstones[16]. Open cholecystectomy remains a common procedure in the treatment of gallbladder disease despite the success of laparoscopic cholecystectomy technique[17]. Introduction of minimally invasive surgery (laparoscopic cholecystectomy) is an important milestone in surgery[18].

Over the last 15 years, laparoscopic cholecystectomy has gained acceptance both by general surgeons and patients all over the world including Pakistan. It has dramatically changed the management of patients with gallbladder diseases and there is significant increase in the total number of gallbladder procedures performed laparoscopically.

The aim of both techniques is to remove the gallbladder safely with low mortality, morbidity and early recovery. Laparoscopic cholecystectomy offers remarkable advantage of minimal surgical trauma with consequent reduction in complications secondary to wound pain. It provides early ambulation and return to activity with minimum scarring[19].

Most off the trauma of an open procedure is inflicted because the surgeons must have a wound large enough to give adequate exposure for safe dissection at the target site. The wound is often the cause of morbidity including infection, dehiscence, bleeding, herniation and nerve entrapment. Wound pain prolongs recover time and, by reducing mobility, contributes to an increased incidence of pulmonary athelectasis, chest infection, paralytic ileus and deep vein thrombosis, which prolongs the recovery time[20].

With experience in training laparoscopic cholecystectomy is applicable to over 95% of patients. It has largely replaced open cholecystectomy because of its well documented advantages[21]. However, with experience, morbidity associated with open cholecystectomy has been reduced to very low level[22].

In my study the frequency of post-operative wound infection (redness, swelling, and discharge) is far less in laparoscopic group as compared to open cholecystectomy group. P-value is significant for 3rd and 5th post-operative day.

Biscoine et al in 2007 reported that laparoscopic cholecystectomy was associated with a low overall risk of surgical site infections and a low risk of incisional infection compared to open cholecystectomy[23]. In yet another prospective randomized trial Boni et al concluded that there is a significant reduction in incisional complications in comparison with open surgery (mean 1.1% vs 4%)[24,25].

Whereas Siddiqui K evaluated in his study that, in cases of chronic cholecystitis, there was no significant difference in the frequency of wound infection between open and laparoscopic cholecystectomy [26].

In my study the post-operative pain score was significantly higher in the open cholecystectomy group as compared to laparoscopic group. P value was significant at 12, 18 and 24hrs post-operatively.

Similar results were shown by Rappapoot et al who evaluated in his study that laparoscopic cholecystectomy is associated with less post-operative pain, earlier discharge from the hospital and a more rapid recovery[27].

Ahmed et al showed in a study that post-operative pain after laparascopic cholecystectomy is generally less in intensity as compared to open cholecystectomy[28].

Keus et al concluded in his randomized clinical trial that patients with small incision cholecystectomy consumed more analgesia when compared to laparoscopic cholecystectomy group due to pain[29].

In the present study, hospital stay was markedly shorter in laparoscopic cholecystectomy group as compared with open cholecystectomy group. The mean hospital stay in open cholecystectomy was 3.7±0.7 days whereas mean value of hospital stay in laparoscopic cholecystectomy group was 1.7±0.5 days. Similar results were shown by Keus et al who found that laparoscopic cholecystectomy is associated with a significantly shorter hospital stay and a quick convalescence compared with the classical open cholecystectomy[30].

Ros et al presented a comparative study between open and laparoscopic group and showed that hospital stay was significantly shorter for both mini-laparotomy and laparoscopic cholecystectomy compared to open cholecystectomy[31].

Yuksel et al concluded that the advantages of laparoscopic cholecystectomy such as less pain and short hospital stay make it the treatment of choice for cholilithiasis [32].

My study validates the previous studies, the results of my study are similar to the previous studies as I also used the standard criteria and techniques for the treatment of cholelitithiasis.

CONCLUSION

Although both techniques i.e., laparoscopic and open cholecystectomy are fairly efficient in treating the patients with gallstone disease. However, laparoscopic cholecystectomy is found to be more reliable with lesser complication rate and shorter hospital stay.

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