ORIGINAL ARTICLE

COMPARATIVE STUDY OF MORBIDITY OF LAPAROSCOPIC VERSUS OPEN CHOLECYSTECTOMY IN COMPLICATED GALLSTONE DISEASE

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ABSTRACT

Background: Gallstone disease is a major health problem worldwide particularly in the adult population. Previously complicated gallstone disease was considered to be a contraindication for laparoscopic cholecystectomy. This initial reluctance has slowly evaporated as a result of increasing expertise. The aim of study was to compare the outcome of laparoscopic with open cholecystectomy in patients with complicated gallstone disease.

Material & Methods: This study was carried out in Surgical Unit-IV, Liaquat University Hospital Jamshoro, from January 2008 to December 2009. One hundred patients were divided in two groups of 50 each; Group A for open Cholecystectomy (OC) and group B for laparoscopic cholecystectomy (LC). Data was analyzed using SPSS software.

Results: Out of 100 patients there was female preponderance with male to female ratio of 1:1.5 in group A and 1:3.5 group B. The mean age was 41.28±12.30 years for group A and 38.44±13.50 for group B. Ultrasound findings revealed was single stone [13(26%) patients in OC vs 10 (20%) patients in LC group], multiple stones [37(74%) patients in OC vs 40 (48%) patients in LC group], Impacted stone [15(30%) patients in OC vs 18 (36%) patients in LC group], Thick wall gallbladder [26(52%) patients in OC vs 25(50%) patients in LC group], empyma [6(12%) patients in OC vs 8(16%) patients in LC group], mucocele [3(6%) patients in OC vs 5(10%) patients in LC group], contracted [7(14%) patients in OC vs 8(16%) patients in LC group]. Operative time range 30 minutes to 90 minutes in both groups. The mean time in OC group was 54.90±15.90 minutes and LC group was 48.30±12.96 minutes (p 0.026). No mortality was reported in this series.

Conclusion: Laparoscopic cholecystectomy is a safe and effective treatment of complicated gallstone disease.

KEY WORDS: Laparoscopy, Cholecystectomy, Gallstone.

INTRODUCTION

Gallstone disease is a major health problem worldwide particularly in the adult population.[1] Gallstones affect about 10% of people in the Western World, more than 80% of these people are asymptomatic.[2,3] Cholecystectomy is one of the most common operations carried out in general surgery.[4] Traditional open cholecystectomy was performed for the first time in 1882 by Carl August Langerbach.[4,5] Open cholecystectomy has been accepted as gold standard treatment of gallstones.[6] The change came after 100 years, when in 1987 Professor Mouret from France started with a new operative method of laparoscopic cholecystectomy.[4,7] Laparoscopic cholecystectomy has revolutionized the treatment of gallstone disease and has almost replaced open cholecystectomy.[8] Since then it became an established procedure due to short hospitalization period, rapid return to normal activity, less post operative pain, more acceptable cosmetic results and lesser morbidity and mortality rates which are the principle advantages of this technique.[7,9] In Pakistan the first laparoscopic cholecystectomy was performed in 1991. The major complications are significantly less in laparoscopic cholecystectomy and it has become the mainstay of management of uncomplicated gallstone disease.[10-12] One of the unanswered questions regarding this procedure is its efficacy in patients with complicated gallstone disease.[12] Previously complicated gallstone disease was considered to be a contraindication for laparoscopic cholecystectomy. This initial reluctance has slowly evaporated as the level of experience within the surgical community has increased.

However 20 year after its inception, uncertainty persists about the application of laparoscopic techniques to the management of patients with complicated gallstone disease.[13,14] In order to answer this question we compared the outcome of laparoscopic with open cholecystectomy in complicated gallstone disease.

The aim of this study was to compare the outcome of the laparoscopic and open cholecystectomy in patients with complicated gallstone disease.

MATERIAL AND METHODS

This study was carried out in Surgical Unit-IV, Liaquat University Hospital Jamshoro, Hyderabad, from January 2008 to December 2009. It consisted of 100 patients with complicated gall stone disease. They were divided into two groups of 50 patients each; Group A for open and group B for laparoscopic cholecystectomy. Detailed history was taken from all the patients with special regard to the abdominal pain or pain in right hypochondrium, lump in right hypochondrium, vomiting, dyspepsia and fever. Thorough clinical examination was done. Right hypochondrium was especially examined for assessment of Murphy's sign, palpable mass and visceromegaly. Systemic review was also done to see any co-morbidity.

All patients underwent base line and specific investigations especially ultrasound of abdomen as diagnostic modality and for assessment of complicated gallstone disease. Inclusion criteria were all patients diagnosed as cases of complicated gallstone disease on the basis of history, clinical examination and investigations. Complicated gallstone disease included cases of acute cholecystitis with phlegm, chronic cholecystitis with mucocele, empyema and perforation with pericholecystic abscess. Exclusion criteria included unfit patients for general anesthesia, pregnancy, patients with carcinoma of gall bladder, patients with acute pancreatitis and patients with obstructive jaundice.

Follow up of all these patients was done at 6 month and one year to assess any complication and inquiry about resumption to work**.** The data was analyzed on SPSS software.

RESULTS

In this study 100 patients with complicated gallstone disease were divided into two groups. In open cholecystectomy group 40% were males and 60% females, with male to female ratio of 1:1.5. In laparoscopic cholecystectomy group 22% were males and 78% females with male to female ratio of 1:3.5. The age range was from 10-70 year in both the groups. The mean age was 41.28±12.30 years for group A and 38.44±13.50 years for group B. Symptoms of patients in both the groups were almost same. Ultrasound findings revealed was single stone in 13(26%) patients of OC group and 10 (20%) patients of LC group where as multiple stones in 37(74%) patients of OC group and 40 (80%) patients of LC group, Impacted stone at the neck of gallbladder was found in 15(30%) patients of OC group and 18 (36%) patients of LC group, Thick wall gallbladder was seen in 26(56%) patients of OC group and 25 (50%) patients of LC group, empyema gallbladder 6 (12%) patients of OC group and 8 (16%) patients of LC group, mucocele 3 (6%) patients of OC group and 5 (10%) patients of LC group, contracted gallbladder 7 (14%) patients of OC group and 8 (16%) patients of LC group, adhesion around gallbladder in 21(42%) patients of OC group and 19 (38%) patients of LC group, cirrhosis of liver in 3 (6%) patients of OC group and 2 (4%) patients of LC group.

Operative time in both groups was recorded. Operative time range 30 minutes to 90 minutes in both groups. The mean time in OC group was 54.90±15.90 minutes and LC group was 48.30±12.96 minutes (p=0.026). The median operative time utilized was 60 minutes for OC group and 45 minutes for LC group.

Severity of post operative pain in both groups was recorded. Mild pain was felt in 6(12%) patients of OC group and 18 (36%) patients of LC group, Moderate pain was seen in 25(50%) patients of OC group and 20 (40%) patients of LC group, severe pain was described by 19(38%) patients in OC group and 12 (24%) patients in LC group (p 0.005).

The common complications seen in this study were nausea and vomiting (10(20%) patients in OC VS 12 (24%) patients in LC group), Chest infection 12 (24%) patients in OC vs. 10 (20%) patients in LC group), Bleeding 10 (20%) patients in OC vs. 8 (16%) patients in LC group), Biliary leak 2 (4%) patients in OC VS 3 (6%) patients in LC group), Wound sepsis 15 (30%) patients in OC vs. 8 (16%) patients in LC group as port site sepsis. However shoulder pain in 7 (14%) cases, Conversion to open in 1 (2%) patient were specific complication of LC group. Re-exploration was carried out one case (2%) in each group (p<0.001).

Early mobilization was seen in LC group where majority of patients 36 (72% recovered their activity in 4-16 hours as compared to OC group where majority of cases 39 (78%) regained their activity in 12-24 hours. The mean mobilization time in OC group was 16.60±47 Hours and LC group was 13.80±5.01 Hours (p=0.015).

The duration of hospital stay varied from 1 to 20 days. It was longer about 4-10 days in

Table 1: Postoperative variable.

Variable	Operative Procedure				
	Open Cholecystectomy		Laparoscopic Cholecyctomy		p-Value
	Number of Patients	Percentage	Number of Patients	Percentage	
Pain					
• Mild	6	12&	18	36%	
• Moderate	25	50%	20	40%	<0.005
• Sever	19	38%	12	24%	
Complications					
• Nausea & Vomiting	10	16%	12	4%	
• Chest infection	12	8%	10	0%	
• Bleeding	10	4%	8	0%	<0.001
• Biliary leak	2	4%	8	4%	
• Wound sepsis	15	4%	8	4%	
• Conversion to open	0	0%	1	2%	
Mobilization time					
• 4 – 8 Hours	3	6%	8	16%	
• 9 – 12 Hours	8	16%	13	26%	
• 13 – 16 Hours	12	24%	15	30%	0.015
• 17 – 20 Hours	17	34%	6	12%	
• 21 – 24 Hours	10	20	8	16%	
Hospital stay					
• 1st Day	0	0%	7	14%	
• 2nd Day	0	0%	10	20%	
• 3rd Day	2	4%	14	28%	
• 4th Day	16	32%	11	22%	
• 5th Day	14	28%	3	6%	
• 6th Day	5	10%	2	4%	
• 7th Day	5	10%	0	0%	
• 10th Day	6	12%	1	2%	
• 15th Day	1	2%	1	2%	
• 20th Day	1	2%	0	0%	<0.001

46(92%) of OC patients as compared to LC cases where majority 42(84%) were discharged within 1 to 4 days. The patients with complications and conversion or re-exploration had still longer stay in both group .The mean hospital stay in OC group was 5.96±3.20 days and LC group was 3.5±2.50 (p=0.001) days.

DISCUSSION

Gallstone disease is a major problem worldwide particularly in adult population. Its incidence shows a considerable geographical and regional variation.[2,15] The morbidity and mortality associated with cholecystectomy has decreased to an extremely low level in the past few decades.[16]

In our study the male to female ratio seen in OC group was 1:1.5 as compared to LC group where it was 1:3.5. However the male to female ratio given by Channa et al[17] 1:6 and Murshid[18] 5:5.1 is quite different from the present study.

The age ranged from 10 to 70 years in both groups with mean age of 41.28±12.30 years for OC group and 38.44±13.50 year for LC group (p=0.272). The peak age group for presentation of gallstones in our study was 20 to 50 years which is comparable to other study where peak age

group was 33 to 44 year.[17] However Murshid showed age range 13 to 90 year with a mean age of 48.4[18] and Rosen Muller et al[19] showed 59 year for OC and 49 years for LC group and Meyer et al[20] 60 years for OC and 54 years for LC group.

In our study the pain in right hypochonderum and epigastrum was the commonest presentation (90%) followed by nausea and vomiting (30%) in both group, dyspepsia (OC 10% vs. LC 20%) and fever (OC 10% vs. LC 18%). However in study of Laghari et al[21] the patients presented with upper abdominal pain either in right hypochonderum (51.67%) or in right hypochondrium and epgastrium (29.17%) or epigastrium (19.17%).

The clinical parameters were further supported by ultrasound examination which revealed single stone in (OC 26% vs. LC 20%), multiple stones in OC 74% vs. LC 80%) cases. Thick wall gallbladder was found in 56% of open cholecystectomy group and 50% of laparoscopic cholecystectomy group, adhesion around the gallbladder in 42% of open and 38% of laparoscopic cholecystectomy group. Ultrasound finding given by Ji et al[22] in their study shows multiple stones in 69.71%, thick wall gallbladder in 41.67% and adhesions in 35% of cases.

The operative time in our series was significantly longer in OC group (p=0.02). The mean operative time for open cholcystectomy group was 54.90±15.92 minutes and for laparoscopic cholecystectomy 48.30±12.96 minutes. The mean operative time given by Khan & Oonwala[23] was 60.5±17.5 for OC and 62±15.2 minutes for LC group. This is opposite to other studies which shows longer operative time in LC group patients.[20,24]

In our study the majority of cases (88%) of OC group felt moderate to severe pain and late recovery as compare to LC group where 31% felt mild to moderate pain (p=0.005) with quick recovery and early mobilization and therefore was less need of postoperative analgesia in LC group. In other studies laparoscopic cholecystectomy have minimum surgical stress, less postoperative pain, fast recovery[25] and early gut motility and feeding.[26]

In our study the postoperative complications were found higher in OC as compared to LC group (p<0.001). The wound sepsis was observed in (OC=30% VS LC=16), which is 2 times higher than LC group. However which frequency of wound infection given by Siddiqui K and Khan AF[24] 3 times higher in OC as compared to LC patients. The Bleeding (OC=20% VS LC=16%) and biliary leak (OC=2% VS LC=3%) were the complications responsible for re-exploration (OC=1 case 2% VS LC=1 case 2%) and conversion (1 case 2% from LC to OC) of the patient. The conversion rate LC to OC from 3.9 to 12 % as given in different studies.[28-31] Conversion exerts adverse effects on operating time, postoperative morbidity, hospital costs, mobilization and hospital stay.[31]

Early mobilization in our study was significant in LC group (p 0.01). The mean mobilization time of patients for OC was 16.60±4.7 hours and for LC group 13.80±5.0 hours with range of 4 to 24 hours. The early mobilization after LC that helps to decrease the postoperative complications, post-operative hospital stay and hence morbidity as compared to open cholecystectomy. This shorter postoperative hospital stay after LC that has enabled the elderly and many high-risk patients to undergo surgical treatment for cholelithiasis and cholecystitis.[16]

The hospital stay in this study ranged from 1 to 20 days in both groups with mean length of hospitalization as 5.9±3.2 days in OC and 3.5±2.5 days in LC group (p<0.001) (Table 2).It is comparable to other studies given by different authors like 5.1 days in OC VS 2.5 days in LC [28], 7.9 days in OC vs. 2.6 days in LC [19], 6.5 ± 3 days for OC and 2±2 days for LC.[30]

Return to normal work extended form 3 to 6 weeks in OC and 1 to 4 weeks in LC group in majority cases (OC=84.5 % VS LC=92%).Mean resumption time to work was 33 days for OC and 20.5 days for LC patients (Table 2). Return to normal work given by Supe AN et al[31] in their study was 19.5 ± 5.4 days for minicholecystectomy and 19.1 ± 3.2 days for LC group. Over all time of return to normal activity and work was shorter in LC as compared to OC patients which is also supported by other studies published in literature.[24,29,32-34]

CONCLUSIONS

Laparoscopic cholecystectomy is a safe and effective treatment of complicated gallstone disease. With low threshold of conversion it has significant advantages over open cholecystectomy with earlier mobilization, minimum hospitalization and fast recovery towards normal life without increasing mortality and morbidity.

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