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A COMPARATIVE STUDY ON POSTOPERATIVE MORBIDITY IN LAPAROSCOPIC AND OPEN CHOLECYSTECTOMY

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Abstract:

Aim: *To compare the postoperative morbidity associated with open and laparoscopic cholecystectomy.*

Material and methods: *The study included 120 patients with cholelithiasis diagnosed in USG. They were divided into two groups. This study was held in the Surgical Unit-II of Jinnah Hospital Lahore for one-year duration from March 2019 to March 2020.*

Results: *The mean age of the patients in group A was 38.6 ± 6.7, and in group B. 38.4 ± 5.7 in group B. In the case of a hospital stay, the mean length of stay in the hospital was 3.7 ± 0.7 in group A versus 1.7 ± 0.5 in group B. p value <0.001. Regarding the number of gallstones, a single stone was present in 12 (20%) patients in the open cholecystectomy group and in 14 (23.3%) patients in the laparoscopic cholecystectomy group. 2-4 stones were present in 20 (33.3%) patients in group A, 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%) of patients in group B. Postoperative pain and postoperative infection were lower in the laparoscopic group compared to open cholecystectomy.*

Conclusion: *Although both techniques Laparoscopic and open cholecystectomy are quite effective in treating patients with gallstone disease, laparoscopic cholecystectomy has been found to be more reliable with lower complication rates and shorter hospital stay.*

Key words: *gallbladder, open cholecystectomy, laparoscopic cholecystectomy.*

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INTRODUCTION:

Gallstones remains one of the most common medical problems leading to surgical intervention. About 500,000 cholecystectomies are performed in the United States each year. Gallstones affect approximately 10% of the adult population in the United States. Gallstones have been shown to increase with age. It is estimated that 20% of adults over the age of 40 and 30% of people over the age of 70 have gallstones. During the reproductive years, the female-to-male ratio is approximately 4: 1, with the gender gap in the older population narrowing to nearly equal. Risk factors that predispose to gallstone formation include obesity, diabetes, estrogen and pregnancy, hemolytic diseases and cirrhosis.

Cholecystectomy, i.e. removal of the gallbladder, is one of the most frequently performed operations in the world. The first open cholecystectomy was performed by Carl August Langenbuch in 1882.

The first laparoscopic cholecystectomy was performed by Philippe Mourtre in 1987, and in Pakistan in 1991. Gallstone is the most common cause of cholecystitis. Patients present with recurrent bouts of upper or right lower abdominal pain, nausea, vomiting, indigestion, indigestion, gas, fatty food intolerance, flatulence and belching.

Gallstones are diagnosed using ultrasound, computed tomography, and magnetic resonance imaging.

Cholecystectomy in the treatment of cholelithiasis is feasible and achievable by open and laparoscopic methods8,9. Surgery for gallstones can be associated with postoperative complications such as pain, nausea, vomiting, and / or wound infection.

Laparoscopic cholecystectomy is the gold standard in the treatment of gallbladder disease; however, open cholecystectomy is still frequently performed in developing countries.

The introduction of the laparoscopic technique to general surgery radically changed the view of the postoperative course of patients after cholecystectomy.

It has been proven that laparoscopic cholecystectomy significantly reduces postoperative pain, and thus enables a shorter hospital stay and recovery period, which translates into earlier return of patients to normal life and work14. In most centers, patients are discharged home on the first day after surgery. However, as experience has developed, few series have recently shown that surgery is safe and feasible even as an outpatient procedure in carefully selected patients.

Therefore, pain relief and patient comfort in the early postoperative period are becoming increasingly important as the need for pain medication may delay discharge. In this study, I want to compare two surgical techniques to minimize hospital stays for patients with postoperative gallstone disease and improve postoperative complications in such patients by adopting better surgical options in the future.

METHODS AND MATERIALS:

A quasi-experimental study was conducted in the Surgical Unit-II of Jinnah Hospital Lahore for one-year duration from March 2019 to March 2020. A total of 120 patients with cholelithiasis diagnosed on ultrasound of the abdominal cavity were enrolled in the study. They were divided into two groups using a random number table, group A and group B, with 60 patients in each group.

Seamless sampling was used to identify women over the age of 20 with gallstones. Patients with a history of abdominal surgery, diabetes mellitus, gallstones of the common bile duct and chronic diseases were excluded from the trial.

Group A underwent open cholecystectomy, while group B underwent laparoscopic cholecystectomy. Both groups received the same type and dose of anesthesia. Surgical records were kept. They were followed for the next 5 days to see complications such as post-operative pain and wound infection. All patients were closely monitored after 6 hours, 12 hours, 18 hours and 24 hours for post-operative pain and on days 1, 3 and 5 for wound infection and hospital stay.

Data analysis was computer based. SPSS version 18.0 was used for the analysis. Interesting variables were hospital stay, pain relief, and wound infection. The numerical variables, ie, age and hospital stay, were calculated as mean ± SD. Frequencies and percentages were used for categorical variables, ie, Pain and wound infection. Both groups measured and compared numerical variables, ie, hospital stay, with the t-test. Qualitative variables such as pain and wound infection were compared with the chi-square test. A p-value of ≤ 0.05 was significant.

RESULTS:

The aim of the study was to compare the postoperative morbidity in open and laparoscopic cholecystectomy. 120 patients were divided into two groups, group A

and group B, with 60 patients in each group. The distribution of cases by age showed 14 (23.3%) patients aged 27-32 in group A and 10 (16.6%) patients in this range in group B. 8 (13.3%) patients aged 33-32 37 years old group A, while 18 (30%) patients in group B. There were 24 (40%) patients aged 38-48 years in group A, while 22 (36.7%) patients in this age group were in group B. 8 (13.3%) patients aged 43-47 were in group A, while 4 (6.7%) patients in group B. 4 (6.7%) patients aged 48-53 belonged to group A, and 6 (10%) of group B. only 2 (3.3%) of patients belonged to the age group ≥54 years in group A, while no patient in 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, the patients had different ways of presentation. In group A, 46 patients reported pain in the right hypochondrium, 16 with vomiting, 54 with dyspepsia, and 52 patients with right hypochondrium tenderness. In the laparoscopic cholecystectomy group, 46 patients presented with RHC pain, 14 with vomiting, and 50 with tenderness in the right hypochondrium (Table 1).

In terms of the number of gallstones, a single stone was present in 12 (20%) in the open cholecystectomy group and 14 (23.3%) in the laparoscopic cholecystectomy group. 2-4 stones were present in 20 (33.3%) patients in group A, while in 16 (26.6%) patients in group B. ≥5 stones were present in 28 (46.7%) patients in group A and 30 (50%) of patients from group B (Table 1).

In the study, the 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. The mean temperature in both groups was 98.2 ± 0.4. The mean respiratory rate was 15.2 ± 1.2 in group A and 19.9 ± 1.2 in group B. Regarding the study; the mean hemoglobin value 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 SGOT value was 39.3 ± 2.5 in group A, and 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 the open cholecystectomy group, while in the laparoscopic cholecystectomy group it was 133.7 ± 9. 3 (tab. 1).

In terms of pain assessment 6 hours after surgery, 14 (23.3%) patients in group A and 34 (56.7%) patients in group B had mild pain. Moderate pain occurred in 32 (53.3%) patients in group A, while 4 (6.7%) patients in group B. 14 (23.3%) patients in group A had severe pain, while 22 (36.7%) of patients in group B experienced no pain at all (Table 1).

Pain scores 12 hours after surgery were presented in both groups. Eight (13.3%) patients in group A and 40 (66.7%) patients in group B had mild pain.

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

18 hours after surgery, 12 (20%) patients in group A and 30 (50.0%) patients in group B had mild pain. Moderate pain occurred in 30 (50%) patients in group A and 12 (20%) patients in group B. 18 (30%) patients in group A and 4 (6.7%) in group B had severe pain (table. 1)

24 hours after surgery, 24 (40%) patients in group A and 16 (26.7%) patients in group B had mild pain. Moderate pain occurred in 24 (46.7%) patients in group A and 10 (16.7%) 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 did not experience any pain (tab
1).

On day 1 after surgery, 4 (6.7%) patients in group A had wound infection, while none of the patients in group B had wound infection (Table 9). On postoperative day 3, 10 (16.7%) patients from group A and 2 (3.3%) patients from group B had wound infection (Table 10). On the 5th postoperative day, 16 (26.7%) patients in group A and none of the patients in group B had wound infection (Table 1).

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

Open Cholecystectomy VS Laparoscopic Cholecystectomy

Symptoms	**Open Cholecystectomy**				**Laparoscopic Cholecystectomy**			
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 Cholecystectomy				Laparoscopic Cholecystectomy			
1	12 (20.0)				14 (23.3)			
2 – 4	20 (33.3)				16 (26.6)			
≥5	28 (46.7)				30 (50.0)			
Variables	Open Cholecystectomy				Laparoscopic Cholecystectomy			
	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 Cholecystectomy				Laparoscopic Cholecystectomy			
	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 Cholecystectomy				Laparoscopic Cholecystectomy			
	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 Cholecystectomy			Laparoscopic Cholecystectomy		
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:

Gallstones remains one of the most common medical problems leading to surgical intervention. Risk factors that predispose to gallstone formation include female gender, obesity, diabetes, estrogen and pregnancy, haemolytic diseases, and cirrhosis. Over the past two decades, the general principle of managing gallstones has not changed significantly. However, treatment methods have changed radically. Cholecystectomy is the removal of the gallbladder and is mainly performed for symptomatic gallstones. Open cholecystectomy remains a common procedure in the treatment of gallbladder disease, despite the success of the laparoscopic cholecystectomy technique. The introduction of minimally invasive surgery (laparoscopic cholecystectomy) is an important milestone in surgery.

Over the past 15 years, laparoscopic cholecystectomy has gained acceptance from both general surgeons and patients around the world, including Pakistan. This radically changed the management of patients with gallbladder diseases and significantly increased the overall number of laparoscopic gall bladder procedures.

Both techniques aim to safely remove the gallbladder with low mortality, morbidity and early recovery. Laparoscopic cholecystectomy offers the remarkable advantage of minimal surgical trauma and, consequently, reduction of complications secondary to wound pain. Provides early walking and recovery with minimal scarring.

Most open surgery injuries are inflicted because surgeons must have a wound large enough to provide adequate exposure for a safe dissection at the target site. Wounds are often the cause of diseases including infection, dehiscence, bleeding, hernias and nerve entrapment. Wound pain extends recovery time, and by reducing mobility, it contributes to an increased incidence of lung obstruction, chest infections, paralytic intestinal obstruction and deep vein thrombosis, which prolong recovery time.

With experience in training laparoscopic cholecystectomy, it is used in over 95% of patients. It has largely replaced open cholecystectomy due to its well-documented benefits. However, with experience, the morbidity associated with open cholecystectomy has been reduced to a very low level.

In my study, the incidence of postoperative wound infections (redness, swelling and discharge) is much lower in the laparoscopic group than in the open cholecystectomy group. The p value is significant on the 3rd and 5th postoperative days.

Biscoine et al. In 2007 reported that laparoscopic cholecystectomy is associated with a low overall risk of surgical site infection and a low risk of incision infection compared to open cholecystectomy23. In yet another prospective randomized trial, Boni et al. Concluded that there was a significant reduction in post-section complications compared to open surgery (mean 1.1% vs 4%).

On the other hand, Siddiqui K estimated in his research that in the case of chronic cholecystitis there is no significant difference in the incidence of wound infections between open and laparoscopic cholecystectomy.
In my study, the assessment of postoperative pain was significantly higher in the open cholecystectomy group compared to the laparoscopic group. The p-value was significant at 12, 18 and 24 hours postoperatively.

Similar results were presented by Rappapoot et al., Who assessed in their studies that laparoscopic cholecystectomy is associated with lower postoperative pain, earlier discharge from the hospital and faster recovery.

Ahmed et al. Have shown in a study that postoperative pain after laparascopic cholecystectomy is generally lower than after open cholecystectomy.
Keus et al. Concluded in their randomized clinical trial that patients with small incision cholecystectomy took more painkillers compared to the laparoscopic cholecystectomy group for pain.

In the present study, the hospital stay was significantly shorter in the laparoscopic cholecystectomy group compared to the open cholecystectomy group. The mean hospital stay with open cholecystectomy was 3.7 ± 0.7 days, while the mean value of stay in the group with laparoscopic cholecystectomy was 1.7 ± 0.5 days. Similar results were obtained by Keus et al., Who found that laparoscopic cholecystectomy was associated with a significantly shorter hospital stay and rapid recovery compared to classic open cholecystectomy.

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

Yuksel et al. Concluded that the advantages of laparoscopic cholecystectomy, such as less pain and a short stay in hospital, make it the treatment of choice for gallstone disease.

My research confirms my previous research, the results of my research are similar to my previous research because I also used standard criteria and techniques to treat gallstone disease.

CONCLUSION:

Although both techniques, ie laparoscopic and open cholecystectomy, are quite effective in the treatment of patients with gallstones. However, laparoscopic cholecystectomy has been found to be more reliable with a lower complication rate and a shorter hospital stay.

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