

ORIGINAL ARTICLE

Comparison of Open versus Laparoscopic Cholecystectomy in patients of Cholelithiasis having Previous Abdominal Surgeries

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ABSTRACT

Background: Most of the surgeons in our setups perform open cholecystectomy (OC) in patients of cholelithiasis having previous abdominal surgery. This is the era of laparoscopic and robotic surgery and laparoscopic cholecystectomy (LC) should be the preferred treatment for these patients as well.

Aim: To observe the effect of previous abdominal surgeries on laparoscopic cholecystectomy.

Study design: Randomized, controlled and multicenter experimental study.

Place and duration of study: Department of Surgery, Central Park Teaching Hospital, Lahore, Noor Hospital, Kot Radha Kishan and Bilquees Hospital, Kasur from 1st January 2020 to 31st December 2021.

Methodology: Fifty eight patients were allocated into 2 groups (29 in each group) not considering age and sex. Both types of surgeries were analyzed on the basis of operating time, post-operative pain (VAS) and complications. Complications were noted i.e. wound infection, bile leakage from cystic duct/CBD injury, gut injury and per operative bleeding. Type of previous surgery was also noted. Data of conversion to open cholecystectomy from laparoscopic cholecystectomy was also recorded.

Results: Mean age of patients in group A was 45.99±13.42 years while mean age of patients in group B was 41.87±14.65 years and p-value 0.105. 75.2% patients in group A were female while 82.1% patients in group B were female (p-value 0.185). Operative time in group A was 45.51±8.32 minutes while operative time in group B was 70.33±13.40 minutes (p-value 0.001). VAS score was 7.34±1.80 in group A while it was 5.24±1.93 in group B (p-value 0.001). 4 patients (13.79%) in group A developed wound infection while 1 patient (3.45%) from group B developed wound infection (p-value 0.005). Bile leakage and gut injury were not seen in any of the patient from both groups. Peroperative bleeding (more than 50ml) was seen in 2 patients of group A (6.90%) while it was seen in 8 patients of group B (27.59%) p-value 0.001. Type of previous surgeries were 24 cases were of mesh hernioplasty (41.38%), 16 cases of herniorrhaphy (27.59%), 10 laparotomies for peritonitis/intestinal obstruction (17.24%) and 8 cases of laparotomies for gynecological problems (13.79%). No case of laparoscopic cholecystectomy was converted to open cholecystectomy.

Conclusion: Laparoscopic cholecystectomy is a safe and excellent option in patients of cholelithiasis having previous abdominal surgery. Even though LC takes more time due to adhesions but this issue does not outweigh the benefits of laparoscopic cholecystectomy over open cholecystectomy.

Keywords: Laparoscopic cholecystectomy, Cholelithiasis

INTRODUCTION

Laparoscopic cholecystectomy (LS) is the gold standard surgical procedure done in gall stone disease.¹ Laparoscopic cholecystectomy has many benefits over open cholecystectomy (OC) in terms of reduced postoperative pain, smaller scar and early discharge from hospital². In the learning curve of laparoscopic surgery, previous abdominal surgeries, ascites, obesity, acutely inflamed gall bladder and pregnancy were considered to be an absolute contraindication of LC. Even if LC was attempted in these cases it was associated with higher complication rate or higher conversion rate to OC³.

With the development of instruments, skills and expertise, laparoscopy now is a safer option⁴. Although a lot of work has already been done now on laparoscopic surgeries in patients having above mentioned contraindications^{5,6}. Our main focus is to find out data of cholecystectomy in those patients who are having cholelithiasis along with previous abdominal surgeries. As OC is a safer option in said condition, but it is associated with more pain, more chances of wound infection, bleeding and incisional hernia. These complications are very less in LC so we want to see how safe LC is in out setup as compared to OC because LS is still considered a relative contraindication.

MATERIALS AND METHODS

This was a randomized, controlled and multicenter experimental study, carried out in Central Park Teaching Hospital, Lahore, Noor

Hospital, Kot Radha Kishan and Bilquees Hospital, Kasur from January 2020 to December 2021. Total 70 patients came in these hospitals with cholelithiasis and having previous abdominal surgeries during this time period. 12 patients were excluded from the study so total 58 patients were included in this study.

Inclusion criteria included all patients having cholelithiasis and previous abdominal surgery from age 15 to 70 years. Exclusion criteria were acute cholecystitis, cirrhosis with ascites, advanced pregnancy, any type of coagulopathy, morbid obesity, any abdominal malignancy, incisional hernias, pancreatitis and obstructive jaundice.

Fifty eight patients were allocated into 2 groups (29 in each group) not considering age and sex. Informed consent was taken from all the patients and type of operation was selected by simple consecutive method. All patients were operated free of cost and by only one surgeon who has vast experience in LC to eliminate cost and surgeon bias.

All patients were admitted one day before surgery, complete history especially of previous surgery was taken, baseline investigations and preoperative anesthesia evaluation were done. Those patients were operated who were fit for anesthesia and having normal values of lab investigations, others were excluded. Patients were assigned groups preoperatively in ward. Open cholecystectomies were done in routine way. In laparoscopic cholecystectomies, first port was passed in umbilical area using open technique under direct vision. Rest of the 3 ports were passed avoiding adhesions or after adhesiolysis, also under vision (Fig. 1).

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Fig. 1 Patient previously having laparotomy with midline scar underwent LC



Both types of surgeries were analyzed on the basis of operating time, post-operative pain and complications. Operating time was calculated in minutes starting from incision to last stitch. Pain was assessed using Visual analogue scale (0-10). 4 Complications were noted i.e. wound infection, bile leakage from cystic duct/CBD injury, gut injury and peroperative bleeding). Type of previous surgery was also noted. Data of conversion to OC from LC was also recorded.

We used SPSS-22 to perform the statistical analysis. The Pearson Chi-square test was used to observe association between categorical variables. The comparison between LC and OC groups was done with the help of t-test for parametric data while with the help of Mann Whitney equation for non-parametric data. A p-value of ≤ 0.05 was calculated to be statistically significant.

RESULTS

Mean age of patients in group A was 45.99 ± 13.42 years while mean age of patients in group B was 41.87 ± 14.65 years. There was no statistical difference between the 2 groups as far age factor is concerned (p-value 0.105). Most of the patients in both groups were female as this disease is more common in females. 75.2% patients in group A were female while 82.1% patients in group B were female, the difference was also not significant (p=0.185) [Table 1].

Operating time of both procedures were compared and were having significant difference (p=0.001) which was quite obvious. Operative time in group A was 45.51 ± 8.32 minutes while operative time in group B was 70.33 ± 13.40 minutes. Post-operative pain was also measured using visual analogue scale (VAS) and results statistically significant. VAS score was 7.34 ± 1.80 in group A while it was 5.24 ± 1.93 in group B (p=0.001) [Table 2].

Complications were noted in both groups but fewer complications were encountered. As far as wound infection is concerned, 4 patients (13.79%) in group A developed wound infection while only 1 patient (3.45%) from group B developed wound infection (p-value 0.005). Bile leakage and gut injury were not seen in any of the patient from both groups so these were not comparable. Peroperative bleeding (more than 50ml) was seen in 2 patients of group A (6.90%) while it was seen in 8 patients of group B (27.59%). This difference was also statistically significant (p=0.001) [Table 3].

Twenty four cases were of mesh hernioplasty for epigastric/paraumbilical hernias (41.38%), 16 cases of herniorrhaphy for epigastric/ Para umbilical hernias (27.59%), 10 laparotomies for peritonitis/intestinal obstruction (17.24%) and 8 cases of laparotomies for gynecological problems (13.79%). No case of LC was converted to OC (Table 4).

Table 1: Demographic information of the patients

Parameters	Group A	Group B	P-value
Age (years)	45.99 ± 13.42	41.87 ± 14.65	0.105
Gender			
Female	75.2%	82.1%	0.185
Male	24.8%	17.9%	

Table 2: Operative time and VAS

Parameters	Group A	Group B	P-value
Mean operative time (min)	45.51 ± 8.32	70.33 ± 13.40	0.001
Visual analogue scale (0-10)	7.34 ± 1.80	5.24 ± 1.93	0.001

Table 3: Frequency of complications

Complications	Group A		Group B		P-value
	No.	%	No.	%	
Wound infection	4	13.79	1	3.45	0.005
Bile leakage	0	0.00	0	0.00	-
Gut injury	0	0.00	0	0.00	-
Bleeding (>50ml)	2	6.90	8	27.59	0.001

Table 4: Type of previous surgeries

Previous surgeries	No.	%
Mesh hernioplasty (epigastric/paraumbilical hernia)	24	41.38
Herniorrhaphy (epigastric/paraumbilical hernia)	16	27.59
Laparotomy (peritonitis/intestinal obstruction)	10	17.24
Laparotomy (gynecological cause)	8	13.79

DISCUSSION

Patients having abdominal surgery develop adhesions in the abdomen making second surgery difficult⁷. Most of the surgeons straight away go with the plan of OC when they have a patient of cholelithiasis having previous abdominal surgery anticipating intra-abdominal adhesions⁸. In our study we saw that LC is a safer option now because the surgeons are more experienced with laparoscopic surgeries. Reviewing the results, we saw that operative time is more in LC as compared to OC. There are multiple reasons for that. First trocar insertion usually take more time in previously operated patients as compared to patients with virgin abdomen because we use open technique and we are super conscious so we go slow. Secondly, adhesions encountered in the way of operating field during LC takes time to lyse which is not in the case with OC. Thirdly bleeding encountered during lysis of adhesion takes our time.

Our results showed that post-operative pain is less in LC as compared to OC which is a well-documented phenomenon shown in multiple previous studies^{9,10}. As long as the operative time is not that much long that long anesthesia problems arise, LC is well tolerated by patients because of less post-operative pain.

We did 29 LC in previously operated patients and none of them were converted to OC. We observed that the adhesions are usually in the midline or where the previous scar was. The anatomy of right hypochondrium is usually normal so after successful entry into the abdomen and breaking the adhesions in the way of operating field LC is straight forward. These findings were contradicting with previous studies showing higher conversion rate up to 25% in previously operated patients¹¹. The possible explanation to this change is that safer and under vision trocar insertion is used for pneumoperitoneum and more advanced instruments like LigasureTM are used to break adhesions.

Complications in both types of surgeries were very minimal in our study because all surgeries were done by experienced surgeon and safer techniques are used. Wound infection was seen slightly more in OC because there is bigger incision and chances of infection are usually high. This finding is also consistent with previous study¹². Per-operative bleeding was more in LC just because of additional work of adhesiolysis which is self-explanatory. The more adhesions are cut the more bleeding occurs. But this bleeding is not so significant that patient requires blood transfusion.

While considering all the parameters observed in this study, only time factor is against LC but the benefits of LC are more like less pain, short hospital stay and early return to work which reduces the overall financial burden on patient¹³.

The limitation of this study was small sample size. The reason for this is that usually there are less patients of cholelithiasis with previous abdominal surgery and surgical centers in which study was conducted were also limited. But even with this

limited sample size, it is possible to ascertain the safety of LC in above mentioned patients.

CONCLUSION

Laparoscopic cholecystectomy is a safe and excellent option in patients of cholelithiasis having previous abdominal surgery. Even though laparoscopic cholecystectomy takes more time due to adhesions but this issue does not outweigh the benefits of laparoscopic cholecystectomy over open cholecystectomy. For those surgeons who think open cholecystectomy is better in these patients, they should practice more laparoscopic surgeries and soon they will change their mind.

Conflict of interest: Nil

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