

## COMPARISON OF PATIENT'S RESPONSE IN LAPAROSCOPIC VERSUS OPEN CHOLECYSTECTOMY

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### ABSTRACT

**Objective:** To compare patient's response in open versus laparoscopic cholecystectomy in terms of pain perception, scar acceptability, fear of blind scar and full recovery time.

**Study Design:** Comparative prospective study.

**Place and Duration of Study:** This study was conducted at department of surgery CMH Kharian and CMH Jhelum, from Mar 2016 to Nov 2018.

**Methodology:** Sixty patients were enrolled in this study and divided into two groups of 30 each, after informed consent. Visual pain assessment scale was used to measure intensity of pain and scar visual analog scale to measure scar characteristics. Recovery time of the patient was calculated from the day of hospital discharge till they join their routine work/job. Fear of blind scars and satisfaction was evaluated by Likert scale.

**Results:** In laparoscopic vs open cholecystectomy pain perception was 80% vs 76.67%, acceptability of scar appearance was 90% vs 27%, fear of blind scar was 70% vs 13.3%, and patients satisfaction was 73.3% vs 90% respectively. Majority of patients who underwent laparoscopic cholecystectomy had an earlier recovery time and minimal scarring.

**Conclusion:** Both the techniques have their own prospects and consequences. There was no difference in pain perception between the two groups. However, patients who had laparoscopic surgery had minimal scarring and a definite edge over open cholecystectomy in terms of scar appearance.

**Keywords:** Cholecystitis, Cholelithiasis, Cholecystectomy, Pain Intensity.

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### INTRODUCTION

It's very much common that a gall stone is found in cholecystitis in patients and open cholecystectomy is considered the major cure for these patients. Gallbladder disease is the reason for augmented burden on health care services and expenditure on patients since it is connected with several hospital visits. ER is visited by patients at least three to four times for pain and they opt medical treatment before making decision for undergoing surgery.

Carl August Langenbach, a German Surgeon, initially performed the open cholecystectomy. There are various treatment modalities in practice like oral dissolution agents and lithotripsy and they do not produce effective result

that is why they are used rarely. Whereas, Laparoscopic surgery is an innovation in the treatment of cholelithiasis and mostly surgeons prefer lap over open cholecystectomy. It was Philip Mouret who performed the laparoscopic surgery for the first time in Lyon, France<sup>1,2</sup>.

After appendectomy, cholecystectomy is the second most performed surgery throughout the world which is most commonly performed in middle aged women. Open cholecystectomy, since its invention it is being performed by various incisions and techniques like Kocher's incision, upper midline incision and right upper transverse incision. Laparoscopic cholecystectomy has now successfully become the most frequently performed procedure.

Laparoscopic surgery has it's for and against. This surgery inflicts to minimum pain experience, early recovery, early relief, daycare procedure and is effective. It has some disadvantages like

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procedure times and increased incident of bile-duct injuries.

Laparoscopic surgery is difficult to perform in cardiac patients because of increased arrhythmias in the patients because of CO<sub>2</sub> insufflations. Moreover, trained doctors and technical experience are highly needed. Limitation of three dimensional depths perception poses a trouble in viewing the internal structures properly. Lap cholecystectomy has a high learning curve. It is also difficult to perform in patients who had previous abdominal surgeries. Abnormal anatomy plus failure to get pre and postoperative cholangiogram, improper dissection, clip positioning and clamping, hasty or blind use of cattery are other inevitable boundaries of the procedure<sup>2</sup>.

Both the techniques have their own pros and cons. Urban population prefer lap over open Cholecystectomy and people from rural background opt for open overlap cholecystectomy because of increased risks in blind procedures and lack of highly trained doctors in rural areas.

Digital technology has enlightened the affected individuals about the options of surgeries available along with their advantages and disadvantages. Recent research studies have shown that focus has changed from right upper transverse incision for cholecystectomy, made at right sub costal area over upper abdomen to laparoscopic cholecystectomy, being a less invasive procedure<sup>3</sup>.

Keeping in view the patient satisfaction, there is a dire need to emphasize the preference of one procedure over the other. This study was conducted to compare patient responses in post-operative pain intensity, scar characteristic, and recovery time in open versus minimally invasive cholecystectomy patients.

## **METHODOLOGY**

This comparative prospective study was conducted at Surgical department of Combined Military Hospital Jhelum and Kharian from March 2016 to November 2018. Patients between the ages of 25-55 years scheduled for cholecys-

tectomy were selected by consecutive non probability sampling technique after informed written consent and Institutional Ethical committee approval.

Patients who had previous abdominal surgery of any kind during the past one year, patients on antidepressants and with comorbid like diabetes mellitus or systemic diseases restricting mobility were excluded from the study.

Overall sixty patients were included in this study. Sample size were calculated by WHO sample size calculator. They were divided into two groups of 30 each. One group had lap-chole and the other open cholecystectomy.

Visual pain assessment Scale was used to measure pain intensity; No pain-0, Mild pain 1-3, Moderate pain 4-5, severe pain 6, very severe pain 7-9 and Worst possible pain-10.

Scar visual analog scale was used to measure scar characteristics. It is a picture based scale calculating pigmentation, vascularity, acceptability and researcher comfort. Recovery time was calculated from the day of hospital discharge to the day patient fully recovers and get back to their routine work. Fear of blind scars and satisfaction was evaluated by Likert scale.

Post-operative data was collected from the patients enrolled in this study by filling a pre-designed questionnaire and analyzed using SPSS 21. Mean  $\pm$  SD was calculated for age and recovery time. Descriptive statistics were calculated as frequencies and percentages and chi square test was applied for comparison and *p*-value of 0.05 was considered significant.

## **RESULTS**

Total 60 symptomatic patients of cholelithiasis were enrolled for study. Demographic profile of the patients showed mean age  $36 \pm 1.25$  years for laparoscopic chole and  $39 \pm 5$  for open cholecystectomy, with 70% females patients. Female to male ratio was 3:1. Recovery time for laparoscopic chole was  $16 \pm 1.5$  and open chole  $19 \pm 2.1$ . Thirty patients underwent Laparoscopic

chole and 30 open cholecystectomy. There were 23 females and 7 males who underwent laparoscopic cholecystectomy while 21 females and 9 males undertook open cholecystectomy. Comparison of various variables considered between the two groups was given in table.

In laparoscopic vs open cholecystectomy acceptability of scar was 90% vs 26.67% and fear of blind scar was 70% vs 13.3% respectively. Pain perception in laparoscopic vs open cholecystectomy was 80% vs 76.67% respectively. Intensity of pain in both the groups is shown in table-II and difference was statistically significant with a *p*-value of <0.05. Patient's satisfaction in laparoscopic vs open cholecystectomy was 90% vs

operative rest is preferred by them in their homes as compared to hospitals since friendly environment helps in smooth and quick recovery especially as per psychological perspective which is mentioned in a study carried out by Mark *et al*<sup>5</sup>.

Acute Cholecystitis disturbs one's daily life activities due to severe pain and restrict the person for putting his best. Work, leisure, and social activities are suddenly interrupted and cholecystitis becomes the center of attention as was mentioned in research conducted by Kneally *et al*<sup>6</sup>.

The key to patient's happiness and satisfaction is post-op pain management. In a study

**Table-I: Frequency of responses between two groups.**

Variables	Laparoscopic Cholecystectomy (n=30)	Open Cholecystectomy (n=30)
Acceptability of Scar appearance	27 (90%)	8 (26.67%)
Fear of Blind Scar	21 (70%)	4 (13.3%)
Pain assessment	24 (80%)	23 (76.6%)
Patient satisfaction	27 (90%)	22 (73.3%)
Recovery time (days)	16 ± 1.5	19 ± 2

**Table-II: Pain perception.**

Pain Perception	Open Cholecystectomy	Laparoscopic Cholecystectomy	<i>p</i> -value
No pain	0	8	<0.05
Mild pain	1	10	
Moderate pain	15	12	
Severe pain	5	1	
Very severe	7	0	
Worst pain	2	0	

73.3%. Most of the patients of laparoscopic cholecystectomy had an earlier recovery as shown in the table.

## DISCUSSION

Laparoscopic cholecystectomy affirmed early recovery and minimal scar formation as compared to the open procedures mentioned by the author Keus *et al*<sup>4</sup>. The researchers gave the results of focus group interviews focusing on various factors. One of these factors was an eagerness to return to their work after cholecystectomy of any type so they usually opt for daycare surgery with minimal hospital stay, minimal scar formation and less blood loss. Post-

carried out by Gustavssons *et al*, a wide variety of adjectives was used to depict post-operative pain, such as; colicky abdominal pain, crampy, excruciating, sharp, and umbilical tie. Sometimes, the cognition of pain became irrelevant and inconsistent with the cholecystectomy procedure, as demonstrated by the patients' postoperative feelings i.e. significant post-operative discomfort from "bloating" which causes intense cramp to sharp pain around wound. The patients do not anticipate such type of postoperative pain but the need oral or intravenous analgesics for their gratification<sup>7</sup>.

Pain is the unavoidable output of every surgery and the sole aim of the surgeon is patient's early and quick relief from pain. In a surgery conducted by Pramod *et al* laparoscopic cholecystectomy patients were seen early relief from post-operative pain as compared to open cholecystectomy patients. Duration of postoperative pain was 18.3 hrs and 30.7 hrs in Laparoscopic vs Open cholecystectomy patients respectively. In a similar study by Shukla *et al* duration of postoperative pain was 14.68 hours in LC Group and 27.92 hours in OC Group<sup>8</sup>. More analgesia and more post-op care were required in open cholecystectomy as compared to laparoscopic cholecystectomy as is mentioned in a study conducted by Kumar *et al*<sup>9</sup>. In our study, the pain was felt during both types of operations almost same with 80% of the patients in laparoscopic cholecystectomy describing the pain as moderate to severe and 76.67% of the patients in open, describing it as moderate to severe as well. My results are slightly different from the studies conducted by other authors as mentioned above.

A study done by Barthelsson *et al* revealed that the inability to judge the amount of pain promoted the feelings of uncertainty and feeling of handicap in performing daily life activities were mentioned by the patients in the results. Participants in this study showed feelings of uncertainty which are related to pain apprehension before surgery and pain experience after surgery<sup>10</sup>. The apprehension in this study was assessed by Scale of Coherence. Another study by Costa suggested that the patients suffered unexpected outcomes because they were not informed and adequately prepared for the pre and postoperative practice<sup>11</sup>.

A research done in 2016 by Rupert studied and compared the two methods of gall bladder removal i.e. open and minimally invasive surgical procedure<sup>12</sup>. It was discovered that the length of hospital stay was 2.01 in Laparoscopic cholecystectomy and 2.95 in Open Cholecystectomy which is comparable to our study which states 16 days full recovery in Laparoscopic Cholecystectomy and 19 days in Open Cholecys-

tectomy. In another study carried out by Saeed *et al*, it was mentioned that the laparoscopic surgery characterizes sternly non-invasive surgical approach and is connected with pain free, uneventful recovery and better cosmetic results contrary to open surgery which are in consent to our study<sup>13</sup>. Most of the researches have mentioned patient discharge time instead of full recovery which is the time when the patient is fit to join his/her work.

Another study done by Alys *et al* analyzed the differences in pain perception, scar awareness, pain management, operative and recovery time, post-operative complications and hospital stay<sup>14</sup>. The data was collected from patients, health care workers and also opinions were taken from surgeons and paramedical staff working in the surgical departments. Results disclosed that more pain perception was there in healthcare workers but less intervention was required for pain management in health care professionals than ordinary patients. Shorter hospital stay and less post-operative complications were noted in early laparoscopic surgery as compared to the open approach in all patients. Early Laparoscopic surgery satisfied 90% of the patients which is in accordance with our study in which 90% of the patients were satisfied with laparoscopic cholecystectomy as well.

Scar's Cosmetic appearance is generally significant in female patients. Laparoscopic cholecystectomy has three small scars as compared to Open Cholecystectomy which has a single large scar but the cosmetically appealing surgery is Laparoscopic Cholecystectomy because of its smaller and quick healing scars. A study done by Salman *et al* revealed that on visual analog scale, the mean score for scar cosmetics was 8.6 vs 6.2 in laparoscopic vs open chole<sup>15</sup>. In our study, 90% patients of lap Cholecystectomy were contented as compared to 27% of Open Cholecystectomy.

This study results resembled with the study conducted by Salman *et al*.

No research has been carried out regarding the patient's fear of the blind incisions like the

ones in laparoscopic cholecystectomy can inflict in the patient. In our study it is mentioned that 70% of the patients are scared of blind scarring as compared to only 13.3% were scared of the damage in open cholecystectomy.

Laparoscopic cholecystectomy has reduced the length of hospital stay and has low rate of post-operative complications, but if any complication occurs, the patient usually lands up in open cholecystectomy as was mentioned in a research done by Kulen *et al*<sup>16</sup>.

Rao *et al* in their study have shown better results for laparoscopic cholecystectomy in an ambulatory setup in terms of patient's gratification, decreased hospital stay and small abdominal scar. They believed that ambulatory laparoscopic cholecystectomies are safe in aged patients as shown by decreased post-operative complication rates<sup>17</sup>.

Previous researches were fixated mainly on surgeon's expertise/characteristics and postoperative complications in both the techniques, and less attention was being paid to patient and nursing care.

The aim of this comparative study was to gain a deeper understanding of both the Cholecystectomies (Laparoscopic vs Open) in terms of their basic methods, patient's perceptions, expectations and demands, post-operative pain control, until discharge from the hospital and to work place after a speedy recovery. Overall study concluded that laparoscopic cholecystectomy has induced a revolution in removal of diseased gall bladder with its minimal invasive technique, low complications rate, shorter hospital stay and early recovery. On the other hand open cholecystectomy is preferred by surgeons in elderly and in difficult cases which is comparable to an earlier study by Kulen *et al*<sup>16</sup>.

Regardless of the recent studies favoring laparoscopic cholecystectomy, health care professionals (requiring cholecystectomy) are oblivious to that fact and are less in favor of laparoscopic cholecystectomy and are more intimidated by its complications. Whereas most non-medical

patients favored the laparoscopic cholecystectomy and had uneventful recovery, but some of them shared many unexpected happenings this is analogous to a study done by Beyer-Berjot *et al*<sup>19</sup>. Nevertheless, there is no substitute for experience and the decision of right procedure at the right time. Patient's safety being utmost priority.

## CONCLUSION

Both the surgical approaches are widely in vogue. Both the techniques have their own prospects and consequences but laparoscopic cholecystectomy definitely has edge over open procedure in terms of scar appearance, recovery time and patient satisfaction.

## CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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