

## TO COMPARE THE SEVERITY OF POST OPERATIVE PAIN AND INCIDENCE OF INCISIONAL HERNIA IN OPEN CHOLECYSTECTOMY: RECTUS SPARING V/S RECTUS CUTTING INCISIONS

Naveed Ahmed, Syed Hashim Zaidi\*, Safdar Hussain Awan, Mudasir Saleem, Muhammad Javad Yousaf\*\*, Farhan Tariq\*\*\*

Pak Emirates Military Hospital/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, \*Combined Military Hospital Multan Pakistan, \*\*Army Medical College/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, \*\*\*70 Medical Battalion Lahore Pakistan

### ABSTRACT

**Objective:** To compare the severity of post-operative pain and incidence of incisional hernia in open cholecystectomy while making rectus sparing and rectus cutting incisions in patients with symptomatic cholelithiasis.

**Study Design:** Randomized controlled trial.

**Place and Duration of Study:** Combined Military Hospital Skardu, three years with effect from May 2012 to May 2015.

**Material and Methods:** Patients meeting the inclusion criteria who underwent elective open cholecystectomy were included in the study. Written informed consent was taken before surgery. Approval of hospital ethics committee was also granted. Patients were divided into two groups "I" and "II" of sixty one patients each. In group "I", patients underwent open cholecystectomy by making rectus sparing subcostal incision. In group "2", patients underwent open cholecystectomy by making rectus cutting subcostal incision. Patients were assessed on 1st, 2nd and 7th postop days for severity of pain using visual analogue score. Patients in both groups were also followed up to look for development of incisional hernia.

**Results:** Severity of post-operative pain is much less in patients undergoing open cholecystectomy by making rectus sparing subcostal incision. However no difference was noted in both techniques in terms of incidence of incisional hernia as no patient in any group developed this morbidity.

**Conclusion:** Use of rectus sparing subcostal incision was found more feasible in open cholecystectomy in terms of severity of postoperative pain as compared to rectus cutting incision. However, both techniques did not reveal any difference in terms of incidence of incisional hernia as no patient in either group developed hernia on six months follow up.

**Keywords:** Incisional hernia, Open cholecystectomy, Rectus cutting, Rectus sparing.

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### INTRODUCTION

Cholelithiasis is a very common pathology encountered in surgical clinics. Though most of the patients are asymptomatic but when they are followed, around 1 to 4% patients do develop symptoms per annum<sup>1</sup>. Treatment of gallstones depends on whether they are causing any symptoms or not. Recurrent episodes of upper abdominal pain are considered the most common indication of treatment<sup>2</sup>. Asymptomatic gall-

stones can follow an expectant management<sup>3</sup>. However, once the patient becomes symptomatic, cholecystectomy should be considered both to alleviate the symptoms and to avoid complications. Cholecystectomy can be done laparoscopically or by open method. Open cholecystectomy was formerly the method of choice for treatment of symptomatic gallstones until the advent of minimal access surgery<sup>4</sup>. Minimal access surgery is known as the "marriage of modern technology"<sup>5</sup>. Where facilities and experience are available, laparoscopic cholecystectomy should be considered because of the advantages the patient and the surgeon get out of

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**Correspondence:** Dr Naveed Ahmed, Dept of Peads Surgery, Pak Emirates Military Hospital Rawalpindi Pakistan  
Email: [amcolian22@gmail.com](mailto:amcolian22@gmail.com)

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it like short operating times, short hospital stay, faster recuperation, less post-operative pain, better cosmesis and early return to work<sup>6</sup>. Laparoscopic cholecystectomy has become the standard treatment for symptomatic cholelithiasis<sup>7</sup>. The limiting factor in laparoscopic surgery is the cost of the equipment, its availability especially in the remote and resource constraint areas of the country, provision of the adequate training and a long learning curve<sup>8</sup>. Keeping in view all this, the most feasible option left for the symptomatic gall stones is open cholecystectomy. This procedure is still widely used in the areas where facilities for laparoscopic cholecystectomy are not available. It is a cost effective procedure and has a short learning curve. There are many approaches to perform open cholecystectomy like right subcostal (Kocher's incision), right upper transverse incision, right paramedian incision and upper midline incision. Kocher's incision is most commonly implied incision for open cholecystectomy<sup>9</sup>. There can be two methods to gain access in peritoneal cavity through Kocher's incision. One is by retracting and sparing the rectus abdominis muscle and other is by cutting the rectus abdominis muscle. Both methods have different outcome in terms of operating time, postop pain, hospital stay and postop morbidity like incisional hernia. Incisional hernias after abdominal surgery are common. There are many factors that can lead to development of incisional hernia like adequacy of abdominal wound closure, occurrence of wound infection, morbid obesity, type of incision, use of steroids and advanced age<sup>10</sup>. Pain is the major concern of the patients who undergo any type of surgical procedure and its importance cannot be overlooked. Now pain is considered a 5th vital sign. Postsurgical pain having multifactorial aetiology has remained a main concern for surgeons influencing the outcomes of surgery<sup>11</sup>. Postsurgical pain is found to be even more distressing than postoperative nausea and vomiting with cost of recovery increasing significantly in patients that develop it in postoperative period<sup>12</sup>. Different strategies have

been adopted to reduce the postoperative pain associated morbidity starting from switching over to minimally invasive surgery from open surgery, and adopting the strategies of shorter incisions and minimal possible dissection approach in open surgery<sup>13</sup>.

The rationale of this study was that open cholecystectomy performed by rectus sparing technique is the preferred method of laparotomy with symptomatic gall stones because of better outcome in terms of decreased postop pain and reduced incidence of incisional hernia. Objective of this study was to compare the postoperative pain and incidence of incisional hernia in open cholecystectomy while using rectus sparing and rectus cutting approaches in patients with symptomatic gall stones.

## **MATERIAL AND METHODS**

It was a randomized controlled trial at Combined Military Hospital (CMH) Skardu from May 2012 to May 2015. One hundred and twenty two patients undergoing elective open cholecystectomy who met the inclusion criteria, diagnosed to have symptomatic gallstones, in all age groups and both genders, were included in the study. Patients were divided in to two groups "I" and "II" of 61 each by random number table. Patients with following conditions were excluded from the study: common bile duct stones causing obstructive jaundice, cholangitis or pancreatitis, empyema of gall bladder, intraoperative common bile duct injury and past history of upper abdominal surgery. In group "I", patients underwent open cholecystectomy by using rectus sparing Kocher's incision. In group "II", patients underwent open cholecystectomy by using rectus cutting Kocher's incision. After confirming the diagnosis of cholelithiasis by ultrasonography, preoperative workup included blood tests like complete blood counts, liver function tests and hepatitis B and C screening. Other investigations were requested depending on the age and comorbid of the patient. On admission the group to the patient was allocated through purposive (non-probability) sampling technique. The

operations were performed under general anaesthesia by a consultant surgeon. Severity of pain was measured using Visual Analogue Score on 1st, 2nd and 7th postop days. Patients were discharged depending upon the individual response. In order to see the true effects of the incisions used in terms of severity of pain, patients in both the groups were given same intravenous analgesia in the same dose i.e. I/V

were analysed using nonparametric independent sample Mann-Whitney U-test on 1st, 2nd and 7th postop day. A  $p$ -value  $\leq 0.05$  was considered significant.

## RESULTS

One hundred and twenty two patients with symptomatic cholelithiasis were included in the study. Patients were divided in to two groups "I" and "II" that underwent open

**Table-I: Analysis of total study population in terms of severity of pain.**

	Visual Analogue Score on 1st postop Day	Visual Analogue Score on 2nd postop Day	Visual Analogue Score on 7th postop Day
Mean	7.25	5.92	0.93
Median	7.00	6.00	1.00
Std Deviation	0.856	1.033	0.888
Minimum	6	4	0
Maximum	9	8	3

**Table-II: Analysis of group "I" in terms of severity of pain.**

	Visual Analogue Score on 1st postop Day	Visual Analogue Score on 2nd postop Day	Visual Analogue Score on 7th postop Day
Mean	6.72	5.18	0.33
Median	7.00	5.00	0.00
Std Deviation	0.609	0.764	0.473
Minimum	6	4	0
Maximum	8	7	1

**Table-III: Analysis of group "II" in terms of severity of pain.**

	Visual Analogue Score on 1st postop Day	Visual Analogue Score on 2nd postop Day	Visual Analogue Score on 7th postop Day
Mean	7.77	6.66	1.54
Median	8.00	7.00	2.00
Std Deviation	0.739	0.680	0.787
Minimum	6	5	0
Maximum	9	8	3

ketorolac at the dose of 30mg 12 hourly for first twenty four hours and at the time of discharge, oral panadol 500 mg 8 hourly for 3 days. Patients were also followed for six months to look for development of incisional hernia. Data was entered in a specifically designed proforma. Comparison of data of postoperative pain and incisional hernia was done by specific tests on SPSS version 21. Descriptive statistics like mean, median, standard deviation, frequency and percentages were used to describe data. Results obtained in the light of Visual Analogue Score

cholecystectomy by making rectus sparing Kocher's incision and rectus cutting Kocher's incision respectively. Patients in both the groups were randomized using Random Number Table. Nineteen (15%) males and 103 (85%) females patients were included in the study. In both groups, minimum and maximum age of the patients was 15 years and 70 years respectively.

In group "I", mean age was 40.89 years (15 to 70 years) with standard deviation of 12.737. There were 7 (11.5%) male and 54 (88.5%) female patients.

In group "II", mean age was 40.77 years (17 to 62 years) with standard deviation of 12.618. There were 12 (20%) male and 49 (80%) female patients. No patients were dropped out or lost at any point in the study.

Table-I shows the severity of pain in all the patients included in the study.

Table-II shows the severity of pain in group "I" and table-III shows the severity of pain in group "II".

Results obtained in the light of visual analogue score were analysed using non-parametric independent sample Mann-Whitney U test and the results were found to be highly significant as the *p*-value was 0.001 on 1st, 2nd and 7th postop day. The severity of pain experienced by the patients operated in group 'I' was much less as compared to group "II".

No patient in either group developed incisional hernia on 6 months followup.

## DISCUSSION

In this study two different techniques of open cholecystectomy were compared in terms of postoperative pain and incidence of incisional hernia. As the standard treatment for symptomatic gallstones in the present era is laparoscopic cholecystectomy due to its advantages like early recovery and less morbidity like pain but in our setup, both military and civil, open cholecystectomy is still widely practiced especially in military settings due to provision of medical services at very far off areas of the country where laparoscopic equipment is either not available or regular maintenance is not possible due to the distances and time factor involved. As laparoscopic cholecystectomy has greatly replaced the open cholecystectomy, so very little literature is available comparing two different techniques of open procedure. In this study, in both the groups, the mean pain score on 1st, 2nd and 7th postop day was 7.25, 5.92 and 0.93 respectively. These results are comparable to a study performed in Philippines by Kamhaway *et al* that showed these figures to be 6.7, 5.8 and 1.8

respectively<sup>14</sup>. In our study the minimum to maximum pain score in group "I" on 1st, 2nd and 7th day was 6 to 8, 4 to 7 and 0 to 1 respectively, whereas, in the study mentioned above these values were 5 to 7, 4 to 6 and 1 to 3 respectively. In our study the minimum to maximum pain score in group "II" on 1st, 2nd and 7th day was 6 to 9, 5 to 8 and 0 to 3 respectively whereas in the study mentioned these values were 6 to 8, 5 to 6 and 1 to 3 respectively. So the pain scores obtained in our study were very much comparable to the study mentioned despite the fact that in that study the numbers of patients were much less as compared to our study i.e. 63 patients. Another study was performed at Khyber Teaching Hospital over a span of five years including 135 patients who were operated by open method and in whom severity of pain was measured only for first 24 hours<sup>15</sup>. In that study mean pain score in rectus sparing group was 5 and in rectus cutting group it was 6.73 whereas in our study these values after first 24 hours turned out to be 6.72 and 7.77 respectively that shows severity of pain is higher in our patients in both groups after first 24 hours. There can be one reason in this regard that in study quoted it was not mentioned that postoperatively which intravenous analgesia was used and at what doses it was used. Likewise, whether same analgesics were used in both groups was also not mentioned, whereas, in our study, the type and dose of analgesic were same in both the groups postoperatively. In another study which compared two techniques of rectus sparing and rectus cutting incisions, the results were statistically significant favouring rectus sparing technique in terms of severity of pain and early postop mobilization, that supports the concept given in our study, however in the study mentioned McGill pain questionnaire was used instead of Visual Analogue Score that was used in our study<sup>16</sup>.

After abdominal surgery development of incisional hernia is a common morbidity. There are many factors that can lead to this happening but one of the factors that can contribute to

development of incisional hernia is the type and length of the incision<sup>17,18</sup>. In one study 129 patients operated by open rectus cutting technique were followed for development of incisional hernia. Five patients were found to develop this complication<sup>19</sup>. In our study, it was hypothesized that patients in group "II" will be more at risk to develop incisional hernia due to rectus cutting approach as compared to group "I" in whom rectus muscle was spared but on six months follow-up no patient developed incisional hernia in both the groups.

There can be many reasons to this difference and one which is obvious is that in the study mentioned, mean followup duration was 8 years whereas in our study the follow up time was 6 months. Secondly we excluded the patients which had conditions that can predispose to development of incisional hernia<sup>20</sup> like jaundiced patients or patients with acute gallbladder conditions like empyema because our aim was to compare two surgical techniques and tried to exclude other contributory factors in this regard.

## CONCLUSION

Use of rectus sparing subcostal incision was found more feasible in open cholecystectomy in terms of severity of postoperative pain as compared to rectus cutting incision. However, both techniques did not reveal any difference in terms of incidence of incisional hernia as no patient in either group developed hernia on six months follow up.

## CONFLICT OF INTEREST

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

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