

## COMPARATIVE EVALUATION OF POST-OPERATIVE PAIN BETWEEN CONVENTIONAL LAPAROSCOPIC CHOLECYSTECTOMY & SINGLE INCISION LAPAROSCOPIC CHOLECYSTECTOMY

Dr. Sanjay Kumar<sup>1</sup>, Dr. Ashok Kaundal<sup>2</sup>, Dr. Suneet Katoch<sup>3</sup>

<sup>1</sup>M.O. Specialist, General Surgery, M.G.M.S.C. Khaneri, Dept. of Health and Family Welfare Himachal Pradesh

<sup>2</sup> Associate Professor, General Surgery, Dept. of General Surgery I.G.M.C. Shimla

<sup>3</sup> M.O. Specialist, General Surgery, M.G.M.S.C. Khaneri, Dept. of Health and Family Welfare Himachal Pradesh

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**Corresponding author:** Dr. Ashok Kaundal

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### Abstract

**AIM:** Comparative analysis of post-operative pain between Single Incision Laparoscopic Cholecystectomy and conventional Laparoscopic Cholecystectomy.

**Method:** Patients suffering from symptomatic cholelithiasis were randomly subjected to Single Incision Laparoscopic Cholecystectomy (SILC) and conventional four ports Laparoscopic Cholecystectomy (cLC). Data analyzed included duration of surgery, post-operative pain, For assessment of post-operative pain numeric pain scale scoring system was used and pain scoring done at four hours, twelve hours and twenty-four hours post-operatively.

**Results:** The study included fifty patients operated upon from June, 2014 to May, 2014. Twenty-five patients were subjected to SILC and rest of the twenty-five underwent cLC. Pre-operative characteristics of two groups were similar and there was no significant difference between two groups based on age, sex and Body Mass Index. Post-operative pain score was higher for cLC compared to SILC at four, twelve and twenty-four hours post-operatively. The mean pain score at four hours was  $4.64 \pm 1.89$  for SILC versus  $7.72 \pm 0.84$  for cLC ( $p$ -value  $< 0.0001$ ). While the score at twelve and twenty-four hours were  $2.96 \pm 1.88$  and  $1.80 \pm 1.44$  for SILC compared to  $5.08 \pm 1.15$  and  $3.80 \pm 1.11$  for cLC respectively.

**Conclusion:** SILC is superior to cLC compared to post-operative pain as per our study.

**Keywords:** SILC, cLC, post-operative pain

### Introduction

Over the last 20 years, conventional laparoscopic cholecystectomy (cLC) as less invasive method, has replaced open cholecystectomy in the treatment of patients with symptomatic gallstone disease. In recent years, a search for even more minimally invasive approaches has led to innovative techniques of single incision laparoscopic surgery (SILS) and natural orifice transluminal endoscopic surgery (NOTES). While substantial drawbacks of NOTES technique including technical challenges and scarcity of instrumentation, have limited its adoption so far<sup>1</sup>, the SILS has met more favourable acceptance in surgical community. Its feasibility and safety have been proved in a number of surgical procedures including cholecystectomy<sup>2,3</sup>.

Conventional laparoscopic cholecystectomy is done using four ports. With an effort to minimize the number of ports, single-incision laparoscopic surgery (SILS) has come into practice<sup>2</sup>. SILS is a rapidly evolving method that is complementing traditional laparoscopy in selected fields and patients<sup>3,4</sup>. It has also been suggested as a bridge between traditional laparoscopy and natural orifice transluminal endoscopic surgery (NOTES)<sup>5</sup>.

SILC is perhaps the most common SILS procedure, used to treat patients with gall stone disease. It is being considered as no-scar surgery because the incision is placed within the umbilical scar that is not visible<sup>7,8</sup>. SILC has also shown to have reduced postoperative pain as compared to four-port cholecystectomy in a recent randomized study, although the sample size was small.

### Material and Methods

The present prospective study included ultrasonographically proved 50 patients of symptomatic cholelithiasis posted for elective cholecystectomy. These patients were admitted in Surgical Wards of Indira Gandhi Medical College, Shimla. SILC was performed on 25 (50% of patients) and conventional laparoscopic cholecystectomy conducted in rest of 25 (50%) patients. The patients were selected randomly. All the patients were subjected to same general anesthesia, antibiotics, perioperative analgesics and intravenous fluids. SILC was done by infra-umbilical incision and conventional LC done by four Trocars Technique.

Patients having following conditions were excluded from the study.

1. Acute Cholecystitis /Pancreatitis.
2. Choledocholithiasis
3. Jaundice /Hypoproteinemia /Malignancy
4. History of Allergy , taking Steroids and Chemotherapy
5. Patients on Oral Contraceptive Pills or pregnant.
6. Patients requiring intra-operative blood transfusion.
7. Conversion of conventional LC to OC.
8. Intra operative injury to adjacent organs/structures.
9. Cholecystoenteric fistulae

### Results

Pain experienced by patients following surgery is compared between two groups using numeric pain rating scale. Patients were asked to score the pain experience by

them on scale of 0 to 10, four hours, twelve hours and twenty four hours post-surgery, a higher score signifies greater pain experienced by patient. Both group of patient were given standard NSAIDs (Diclofenac) post-operatively.

In SILC group numeric pain score four hours after surgery ranged from 3 to 9 while that for cLC group ranged from 6 to 9. For comparison the pain score is sub-grouped into three categories viz: score less than or equal to 3, score between 4-6 and score equal to or more than 7. Mean pain score for the SILC group is  $4.64 \pm 1.89$  while that for the cLC group is  $7.72 \pm 0.843$ . p-value for the comparison is 0.0001 which depicts that there is significant difference in the pain between the groups. Clearly the pain experienced by the SILC group is significantly lower than the cLC group.

**Table 1: Pain Comparison After Four Hours**

| Score    | SILC            |      | Clc              |      |
|----------|-----------------|------|------------------|------|
|          | n=25            | %age | n=25             | %age |
| $\leq 3$ | 11              | 44   | 0                | 0    |
| 4-6      | 10              | 40   | 2                | 8    |
| $\geq 7$ | 4               | 16   | 23               | 92   |
| Mean     | $4.64 \pm 1.89$ |      | $7.72 \pm 0.843$ |      |

p-value = 0.0001 ( p-value < 0.05; significant.)

The numeric pain score following 12 hours of surgery ranged from 1 to 9 in SILC group while that form cLC group ranged from 3 to 7. The pain scoring is sub-grouped into three categories. Mean score for SILC group

is  $2.96 \pm 1.881$  while that for cLC group is  $5.08 \pm 1.152$ . p-value for the comparison is 0.0001 that signifies that there is significantly lower pain felt by patients undergoing SILC twelve hours after surgery.

**Table 2: Pain Comparison After 12 Hours**

| Score    | SILC             |      | cLC              |      |
|----------|------------------|------|------------------|------|
|          | n=25             | %age | n=25             | %age |
| $\leq 3$ | 20               | 80   | 2                | 8    |
| 4-6      | 3                | 12   | 20               | 80   |
| $\geq 7$ | 2                | 8    | 3                | 12   |
| Mean     | $2.96 \pm 1.881$ |      | $5.08 \pm 1.152$ |      |

p-value = 0.0001 (value <0.05 ; significant)

The numeric pain score following 24 hours of surgery ranged from 1 to 7 in SILC group while that form cLC group ranged from 2 to 7. The pain scoring is sub-grouped into three categories same as pain scoring comparison at 4 and 12 hours. Mean score for SILC group

is  $1.80 \pm 1.443$  while that for cLC group is  $3.80 \pm 1.118$ . p-value for the comparison is 0.0001 that signifies that there is significantly lower pain experienced by patients undergoing SILC vis-à-vis cLC, twenty four hours after surgery (Figure 5.3 & Table 5.3).

**Table 3: Pain Comparison After 24 Hours**

| Score | SILC         |      | cLC          |      |
|-------|--------------|------|--------------|------|
|       | n=25         | %age | n=25         | %age |
| ≤ 3   | 23           | 92   | 9            | 36   |
| 4-6   | 1            | 4    | 15           | 60   |
| ≥ 7   | 1            | 4    | 1            | 4    |
| Mean  | 1.80 ± 1.443 |      | 3.80 ± 1.118 |      |

p-value = 0.0001 (value <0.05 ; significant)

### Discussion

11 (44%) patients in SILC group had pain score ≤ 3, 10 (40%) patients had score between 4 to 6 while only 4 (16%) patients had score ≥ 7. On the other hand none patient in the cLC group had score ≤ 3, only 2 (8%) had score from 4-6 while majority of patient 23 (92%) had score ≥ 7 four hours after surgery. Mean score for SILC group was 4.64 while that for cLC group was 7.72. p-value for the comparison stands < 0.0001 which depicts that there is significantly low pain experienced by patients undergoing SILC compared to cLC four hours following surgery.

Majority of patients 20(80%) undergoing SILC had score ≤ 3 while in cLC group majority of patients 20(80%) had score between 4 to 6, twelve hours after surgery. Mean score for SILC group was 2.96 while that for cLC group was 5.08. p-value for the comparison stands < 0.0001 which signifies that the patients undergoing SILC had considerably less pain compared to their counterparts in cLC group twelve hours following surgery.

Twenty four hours following surgery majority of patients 23(92%) undergoing SILC had score ≤ 3 while in cLC group majority of patients 15(60%) had score from 4 to 6. Mean score for SILC group was 1.80 while that for cLC group was 2.80. p-value for the comparison stands < 0.0001 which signifies that the patients undergoing SILC had experienced substantially less pain compared to those in cLC group twenty four hours following surgery.

### Conclusion

SILC is superior to cLC compared to post-operative pain as per our study.

### References

1. Tomikawa M, Xu H, Hashizume M: Current status and prerequisites for natural orifice transluminal endoscopic surgery (NOTES). *Surg Today* 2010;40:909–916
2. Ahmed K, Wang TT, Patel VM et al: The role of single-incision laparoscopic surgery in abdominal and pelvic surgery: a systematic review. *SurgEndosc*2011;25:378–396
3. Antoniou SA, Pointner R, Granderath FA: Single-incision laparoscopic cholecystectomy: a systematic review. *SurgEndosc* 2011;25:367–377
4. Podolsky ER, Rottman SJ, Poblete H et al: Single Port Access cholecystectomy: a completely transumbilical approach. *JLaparoendosc Adv Surg Tech A* 2009;19:219–222
5. Roberts KE, Solomon D, Duffy AJ et al: Single-incision laparoscopic and a review of the literature. *J GastrointestSurg*2010;14:506–510
6. CroksonRA, PayneCJ, RatcliffeAP, Soothill JF(1966).Screening test for an acute phase reactant,*ClinChimica Acta* 14:435-441.
7. McGregorG, SodergrenMH, AslanyanA, WrightVJ, PurkayasthaS, DarziA, Paraskeva P. Evaluating systemic stress response in laparoscopic cholecystectomy.*JGastrointest Surg.* 2011 Apr;15(4):614-22.
8. Beal JM, Illinois. Historical perspective of gallstone disease. *The Surgeon Libirary. Surg GynaeObstet* 1984;158:181-189 cholecystectomy: a surgeon's initial experience with 56 consecutive cases