

# Comparison of Single versus Four Port Laparoscopic Cholecystectomy

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## ABSTRACT

**Aim:** To evaluate the outcome of single versus four port laparoscopic cholecystectomy.

**Methods:** This randomized control trial was conducted from 1<sup>st</sup> April 2015 to 30<sup>th</sup> September 2015 in the Department of Surgery, Bolan Medical Complex Hospital Quetta. A total of 100 cases (50 in each group) were enrolled in the study with aged between 20 and 70 years and both sexes undergoing laparoscopic cholecystectomy.

**Results:** The males were 68% in Group A and 60% in Group B while females in Group A were 32% and 40% in Group B with mean 55.43±5.16 years. Comparison of frequency of recurrence of chronic subdural hematoma in both groups was done which shows 8(32%) in Group-A and 3(12%) in Group-B which shows the statistically significant ( $\leq 0.05$ ).

**Conclusion:** There is significantly less post-operative pain in patients undergoing single port laparoscopic cholecystectomy when compared with four port laparoscopic cholecystectomy while mean operative time was significantly lower in four port laparoscopic cholecystectomy.

**Keywords:** Laparoscopic cholecystectomy, Recurrence, Subdural hematoma

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## INTRODUCTION

Cholecystectomy is one of the renowned abdominal surgical procedures and laparoscopically performed in many developed countries. In US, more than 80% of the cholecystectomies are done laparoscopically<sup>1</sup>. New approaches for reducing surgical trauma in laparoscopic surgery are appreciated<sup>2</sup>. These approaches are preferred for minimal access surgery considering the fact of safety and quality i.e. pain and cosmetic effect which requires scar-less surgery<sup>3</sup>.

Single-incision laparoscopic surgery (SILS) is a frequent evolved field as a bridge between conventional laparoscopic surgery and natural orifice transluminal endoscopic surgery. Refinements of existing technology, SILS may be performed without introducing any new instruments, competency or training<sup>4</sup>.

Recent studies have been conducted with the view to reveal that whether this new technique is able to produce better postoperative outcomes. The feasibility of use of single-incision laparoscopic cholecystectomy (SILC) is reported widely in the literature,<sup>5-6</sup> but the findings regarding its effectiveness are variant among studies. This study is planned with the view to clear this ambiguity and provide guideline for the surgeons and patients as well.

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## SUBJECTS AND METHODS

A total of 100 cases (50 in each group) were enrolled in the study with aged between 20 to 70 years and both sexes undergoing laparoscopic cholecystectomy while patients having the history of cholangitis or pancreatitis; or radiological finding of chronic cholecystitis or suspected gallbladder carcinoma were excluded from the study.

All patients fulfilling the inclusion criteria were admitted through the out patients of Department of Surgery, Bolan Medical Complex Hospital, Quetta. A detailed history was taken including demographic data (age, sex, address) and clinical presentation was recorded. They were assured regarding confidentiality and expertise used for the particular procedure and educated for an anticipated better outcome. Two groups (A & B) were made after randomization using lottery method on the basis of technique adopted for their surgery.

In Group A Single incision laparoscopic cholecystectomy was performed while patients of Group-B were selected for four ports laparoscopic cholecystectomy. Both of the procedures were performed by the researcher himself, the operative time of the procedures and pain score on 8th post-operative hour on VAS was recorded.

The collected information was entered in SPSS version 16.0 and analyzed through it. Age, operative time and pain were presented as Mean  $\pm$  S.D. Gender and recurrence was presented as frequency and percentage, t-test was applied on mean operative time and mean post-operative pain score in

both groups to record the significance. P value  $\leq 0.05$  was considered as significant.

## RESULTS

We recorded age range was 20-60 years. In Group-A, 6(24%) patients were between 20-40 years of age and 19(76%) patients were 41-60 years of age while in Group-B, 9(36%) were between 20-40 years and 16(64%) were between 41-60 years of age, mean and sd, was recorded as  $55.43 \pm 5.16$  years (Table 1). Male were 17(68%) in Group A and 15(60%) in Group B. Females in Group A were 8(32%) and 40% (n=10) in Group B (Table 2).

Comparison of frequency of recurrence of chronic subdural hematoma in both groups was done which shows 8(32%) in Group-A and 3(12%) in Group-B. A test of significance (chi square) was applied to know the significance difference which shows p value as 0.040 i.e.  $\leq 0.05$  (Tables 3-4).

Table 1: Age distribution (n=100)

Age (Yrs)	Group A	Group B
20-40	19(38%)	21(42%)
41-70	31(62%)	29(58%)

Table 2: Gender distribution (n=100)

Gender	Group A	Group B
Male	11(22%)	15(30%)
Female	39(78%)	35(70%)

Table 3: Comparison of mean operative time (minutes) (n=100)

Operative time	Group A	Group B	P value
	$63.54 \pm 11.48$	$37.87 \pm 8.74$	0.00

Table 4: Comparison of mean pain score (VAS) (n=100)

Pain score	Group A	Group B	P value
	$2.59 \pm 0.68$	$5.98 \pm 1.14$	0.00

## DISCUSSION

In our study, common age was recorded as  $51.43 \pm 7.22$  years, females were in majority in both groups, while mean pain score in Group-A was recorded as  $63.54 \pm 11.48$  and  $37.87 \pm 8.74$  minutes in Group-B, p value was calculated as 0.001 showing a significant difference. Regarding mean pain score was compared in both group, it was recorded as  $2.59 \pm 0.68$  in Group-A and  $5.98 \pm 1.14$  in Group-B, p value was calculated as 0.000 showing a significant difference.

Our study is supported with the results of a study conducted by Mehmood and others<sup>7</sup> showing that operative time (OT) was significantly lower in the four ports laparoscopic group by calculating  $38.50 \pm 8.92$  minutes and  $80.17 \pm 30.16$  minutes in SILC.

Culp and others<sup>8</sup> concluded that SILC may be an

effective method alternative to traditional four-incision cholecystectomy, having an additional benefit of minimized scarring and a short hospital stay while longer procedural time may be needed initially to adjust for a learning curve. This technique may be performed safely for patients with a multitude of gallbladder diseases without resulting in additional complications.

Another recent study<sup>9</sup> compared the safety of single-port laparoscopic cholecystectomies with standard four-port cholecystectomies and recorded that operating time was significantly shorter in the total single-port group (42 min vs 62 min,  $P < 0.05$ ), no significant differences were found between both groups with regard to length of hospital stay, readmissions and mortality. They concluded that SILC has the potential advantage for being safe technique with a lower complication rate, short in-hospital stay and comparable operating time. SILC provides the patient an almost non-visible scar.

Contrary to the study and some other authors, Ma et al<sup>10</sup> revealed a shorter operating time in the Single-port laparoscopic group and comparable complication rates.

Another study conducted by Culp et al<sup>8</sup> and found slightly longer operating times in the single-port laparoscopic group but also a shorter length of stay in the single-port laparoscopic group with comparable complication rates. Single-port laparoscopy is developed for minimizing the surgical trauma and thereby reducing postoperative pain. Our results reveal less postoperative pain in the Single-port laparoscopy group.

Justo-Janeiro et al<sup>11</sup> recorded no advantages in postoperative pain for single-port laparoscopic, however they concluded that more clinical trials should be conducted.

## CONCLUSION

However, we are of the view that single-port laparoscopic is having the potential for a safer technique with lower post-operative pain and complication rate while it has an additional benefit of less scar which is an important goal of any surgical procedure. This technique may be used in our population for reducing surgical scare and post-operative pain.

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