ORIGINAL ARTICLE

Single-incision Laparoscopic Cholecystectomy (SILC) versus Conventional Three-Incision Laparoscopic Cholecystectomy; A Single Center Experience

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ABSTRACT

Aim: To compare the outcomes of single incisional lap chole (SILC) versus three-incisional lap cholecystectomy.
Methodology: A total of one hundred forty-five (145) adult patients of acute/chronic cholecystitis or symptomatic gallstones were included in this study. This study was prospective non-randomized clinical trial and was conducted in a duration of one year from Jan-2014 to Jan-2015. The choice either to use SILC or conventional LC was purely based on operating surgeon's preference. Conversion to open cholecystectomy, common bile duct (CBD) injury and hospital stay were primary study end-points.
Results: Mean patient's age in SILC group was 40.09±14.26 years and 40.40±12.21 years in conventional group. There was female predominance, with 74.5% females in SILC group and 80.9% in conventional LC group (p-value 0.37). Complications occurred in 4(7.8%) patients in SILC group and in 6(6.4%) patients in conventional group (p-value 0.74). conversion to open laparoscopy was needed in 1(2%) patients in SILC and in 3(3.2%) patients in conventional LC group (p-value 0.66). post-op wound infections occurred in 3 (5.9%) patients in SILC group and in 2(2.1%) patients in 2(2.1%) patients in conventional group (p-value 0.23). Hospital stay was also almost similar 33.29±9.77 hours versus 34.52±16.29 hours in SILC and conventional groups respectively.
Conclusion: Outcomes of single incisional laparoscopic cholecystectomy (SILC) are comparable to that of three-incisional conventional laparoscopic cholecystectomy (LC). So SILC can be used as a routine laparoscopy procedure for removal of gallstones.
Keywords: Laparoscopic surgery, conventional three-incisional Lap chole single

INTRODUCTION

Laparoscopic cholecystectomy (LC) is a gold standard procedure for gall stones removal since decades.[1] Surgeons are always in struggle to develop more precise but less invasive techniques of laparoscopy. Using less number of ports has shown to have same effectiveness but is associated with better cosmetic concerns. Like some previous initially showed that three-ports laparoscopy have similar outcomes as that of 4-port laparoscopy[2,3]. After that the ports were reduced to two, that had the same outcomes as that of three and four incisions laparoscopy[4]. Single-incision laparoscopic cholecystectomy (SILC) is a new and less invasive method of LC for gallbladder removal with safety and efficacy[5,6].

However, some studies have reported higher complications using SILC as compared to conventional methods[7,8]. On contrary some studies have reported less post-op pain and early recovery using SILC.[9-11] Phillips et al. concluded that SILS should be considered only in those cases where cosmetic concerns are more important than the post-op pain and procedural complications[12]. This present aimed to compare the complications of SILC with conventional LC in patients of cholecystitis.

PATIENTS AND METHODS

A total of one hundred forty-five (145) adult patients of acute/chronic cholecystitis or symptomatic gallstones were included in this study. This study was prospective non-randomized clinical trial and was conducted in a duration of one year from Jan-2014 to Jan-2015. The choice either to use SILC or conventional LC was purely based on operating surgeon's preference. We first took approval from hospital ethical committee before starting the study work. An informed consent was also taken from all patients. Data for this study was collected from Jinnah Hospital Lahore.

OPOID's based general anesthesia was used in all cases. Conventional three incisional LC was done through three ports; two 10-mm in the umbilical, epigastrium and third 5-mm port in the right hypo-chondrium region. Umbilical port was used to create pneumo-peritoneum using CO_2 insufflation. It was done using veress needle at a pressure of 14 mmHg.

Same instruments were used for SILC as that of three ports LC. A 10 mm vertical incision was made by umbilicus. Same procedure (as that of conventional LC) was used to create Pneumo-peritoneum.

Camera was first inserted at 0°, and after that shifted to 30° if needed. Conventional Laparoscopic instruments were used in both procedures. Grasper through the upper most port was used to remove gallbladder. While Maryland dissector was used dissect Calot's triangle and to determine the safety of procedure. Infundibular retraction was done using grasper only. A hand-made endo-bag made up of surgical glove secured with purse-sutures, a long thread was to drag the bag out from a 10mm port. After completing the procedure, procedural outcomes and complications will be noted. Conversion to open cholecystectomy, common bile duct (CBD) injury and hospital stay were primary study end-points. While post-operative wound infections were secondary study end-

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points. We used SPSS v23 software for data compilation and analysis. We used Chi-square test/Fisher's exact test for comparison of dichotomous variables. And student's t-test for comparison of continuous variables. P-value ≤0.05 was taken as significant difference.

RESULTS

Mean patient's age in SILC group was 40.09±14.26 years and 40.40±12.21 years in conventional group. There was female predominance, with 74.5% females in SILC group and 80.9% in conventional LC group (p-value 0.37). 21.6% patients in SILC and 13.8% patients in conventional LC group were admitted for cholecystectomy through emergency department of the hospital (p-value 0.23) [Table 1]. Complications occurred in 4(7.8%) patients in SILC group and in 6(6.4%) patients in conventional group (p-value 0.74). conversion to open laparoscopy was needed in 1(2%) patients in SILC and in 3(3.2%) patients in conventional LC group (p-value 0.66). post-op wound infections occurred in 3(5.9%) patients in SILC group and in 2(2.1%) patients in 2(2.1%) patients in conventional group (p-value 0.23). Hospital stay was also almost similar 33.29±9.77 hours versus 34.52±16.29 hours in SILC and conventional groups respectively (p-value 0.62) [Table 2].

Table 1: Baseline Study Variables.

	SILC (n=51)	Conventional LC (n=94)	P-value
Age	40.09±14.26	40.40±12.21	0.89
Gender			
Male	13 (25.5%)	18 (19.1%)	0.37
Female	38 (74.5%)	76 (80.9%)	
Type of Admission			
OPD	40 (78.4%)	81 (86.2%)	0.23
Emergency	11 (21.6%)	13 (13.8%)	

Table 2: Comparison of Study End-points.

	SILC (n=51)	Conventional LC (n=94)	P-value
Complications (%)	4 (7.8%)	6 (6.4%)	0.74
Conversion to open cholecystectomy	1 (2.0%)	3 (3.2%)	0.66
Common bile duct injury	0 (0.0%)	1 (1.1%)	0.46
Wound Infections	3 (5.9%)	2 (2.1%)	0.23
Hospital Stay (Hours)	33.29±9.77	34.52±16.29	0.62

DISCUSSION

Popularity of SILC is increasing day by day all over the globe. However, long operating duration and higher requirements of technical skills are major hinders in its widespread use[7,8]. Malti-port LC started in 1980s and till that time is a gold standard for removal of gallstones[13,14]. Fear from operation, prolonged recovery and formation of scars and operative pain and complications are common concerns in patients undergoing LC. So development of less invasive methods is always of prime importance for operative surgeons.

According to American society of gastrointestinal and endoscopic surgeons (2010), indications and contra-indications and pre-op preparations of SILC are almost same as that of multi-incisional LC[14].

In present study we compared the outcomes of SILC with conventional LC in patients of cholelithiasis. In present study outcomes of SILC and conventional multi-incisional LC were same in cholecystitis patients. Two meta-analysis reports comparing SILC with conventional LC reported that most of these studies were conducted only on smaller patient's sample size recruiting only 30 or less number of cases[15,16].

In present study there was no difference in study outcomes such as conversion rate to open cholecystectomy, CBD injury, wound infection rates and hospital stay between the groups.

Khorgami et al. compared the 4-ports, 3-ports and SILC in cholecystitis patients, these authors compared post-op pain, analgesia requirements, cosmetic concerns and hospital stay and found similar rate of these outcomes between these patients[17].

Another study by Singh et al. also reported same operation time and hospital stay in SILC versus conventional LC groups[18]. Chuang et al. compared operative time, intra-op blood loss, analgesic dose, hospital stay and conversion rates in SILC and 3-ports LC and found similar outcomes[19]. Another study by Chuang et al. concluded that experience of SILC is one of the most important determinant of outcomes of SILC[20].

Main limitation of present study is non-randomization of the study patients. However, there was no significant difference in baseline variables of patients so the risk of biasedness is reduced.

CONCLUSION

Outcomes of single incisional laparoscopic cholecystectomy (SILC) are comparable to that of three-incisional conventional laparoscopic cholecystectomy (LC). So SILC can be used as a routine laparoscopy procedure for removal of gallstones.

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