

# Single Incision Laparoscopic Cholecystectomy – An Initial Experience at Mayo Hospital, Lahore

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## ABSTRACT

**Aim:** To evaluate the clinical outcome after Single Incision Laparoscopic Cholecystectomy.

**Study design:** Descriptive case study

**Place and duration of study:** West Surgical Unit, King Edward Medical University and Mayo Hospital Lahore over a period of 1 year from July 2010 to June 2011.

**Method:** A total number of 50 patients with symptomatic cholelithiasis were admitted. After taking informed consent and preoperative preparation all of them underwent Single Incision Laparoscopic Cholecystectomy using a 5mm telescope with 30 degree angulation (Karl Storz Endoscopy, Inc, Culver City, California, USA) and Roticulator instruments with an Endocone port. Postoperatively pain scores, hospital stay and operative times were recorded on a structured proforma. Follow-up was done at 2 weeks, 6 weeks and 6 months after the procedure.

**Results:** In 50 consecutive patients Single Incision Laparoscopic Cholecystectomy was done with an operative time range of 41-57 minutes and more than half (58%) of patients were discharged on the same day. Most of the patients (94%) reported no or mild pain after the procedure. No deterioration of symptoms occurred during the follow up.

**Conclusion:** Single Incision Laparoscopic Cholecystectomy is a safe procedure which results in less postoperative pain, minimal analgesia requirement, fast recovery and early discharge from the hospital with better cosmetic results.

**Keywords:** Single incision, Laparoscopic Cholecystectomy, Pain, Operative time

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## INTRODUCTION

The evolution of minimally invasive techniques has led to the emergence of two new surgical approaches and multiple intermediate pathways for performing cholecystectomy. On one hand, there is conventional four port laparoscopic cholecystectomy, while on the other there is Single Incision Laparoscopic Surgery (SILS). Many clinical series have clearly shown that laparoscopic cholecystectomy results in a dramatic decrease in hospital stay, post-operative pain, and recovery period<sup>1</sup>. SILS appears to be promising, and is the most rapidly evolving technique acting as a bridge between conventional four-port laparoscopic surgery and natural orifice transluminal endoscopic surgery [NOTES]<sup>2,3</sup>.

The obvious advantages of SILS are that it is nearly scarless and is associated with less pain<sup>4</sup> and faster postoperative recovery<sup>5</sup>. Single-incision access also reduces the risk of complications such as port site injury, intra-operative blood loss<sup>6</sup>, hernia and infection. The single external incision made with the SILS technique is nearly invisible if placed within the patient's navel, and therefore, subjectively not seen

as a disadvantage compared with conventional laparoscopic approach<sup>7,8</sup>. SILS is comparatively easy for a laparoscopic surgeon using conventional or modified laparoscopic instruments and can also be easily converted to the conventional multi-port laparoscopic surgery if needed<sup>9,10</sup>. The advent of single incision laparoscopic surgery has brought renewed attention to cholecystectomy due to the promise of improved cosmesis and less parietal trauma. However, controversy still exists regarding its feasibility and safety.

## PATIENTS AND METHODS

Fifty patients with the indication of elective cholecystectomy, fulfilling the inclusion criteria (Table 1) were selected from the outpatient department of Mayo Hospital, Lahore. An informed consent was taken from the patient about the study, operative procedure and the outcome. A detailed history of the presenting complaints, physical examination, routine investigations (blood complete examination, urine complete examination, urea, creatinine and electrolytes) and some specific investigations (chest X-ray, electrocardiogram, and ultrasound abdomen) were carried out.

The patients thus selected received surgical treatment in the form of SILS cholecystectomy. IV

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third generation cephalosporin( Ceftriaxone 2g) was given at induction.All the procedures were performed by a single senior surgeon with advanced laparoscopic surgery training including single incision laparoscopy.Time required for each surgery was noted individually. Post-operative events were recorded till the patients were discharged. The intensity of post-operative pain was measured through the visual analogue scale (VAS) which (Table 2). Patients were followed up at 2 weeks, 6 weeks and 6 months. Patients of the age of 20-60 years, having symptomatic disease and radiological evidence of gallstone disease were included in the study. Pregnant patients with previous midline incision and have BMI  $\geq 45$  were excluded from the study.

**Operative technique:** Anesthesia was induced with Propofol (2.5mg/kg), Atracurium bromide (0.6 mg/kg),Suxamethonim(1mg/kg) and maintained with Isoflurane (0.8%–1.5%), Nitrous oxide in 40% oxygen. A temporary nasogastric tube was placed to promote emptying of gastric contents. After the operative field had been prepared and draped, patients were placed in reverse Trendelenburg position. A single incision 25 mm length was made below the umbilicus as an approach to abdominal cavity (Fig 1 & Fig 2).

Fig.1: SILS incision immediately post operatively



Fig.2: SILS Scar 2 weeks postoperatively



Pneumoperitoneum was created after insertion of the Endocone single portal system. Gas insufflation was performed by automatic insufflators at a rate of 2 L/min until the intra-abdominal pressure reached 12–15 mm Hg.A 5mm telescope with 30 degree angulation (Karl Storz Endoscopy, Inc, Culver City, California, USA) was inserted to visualize the abdomen. Roticulator instruments including a grasper, L-hook and a Maryland forceps were inserted through the Endocone 5mm ports to proceed with the dissection of the gallbladder using the retrograde technique of laparoscopic cholecystectomy. In order to fully visualize the calot's triangle, the gallbladder was retracted cephalad using a silk no 0 suture introduced transabdominally using a straight Keith needle. The gallbladder was removed through the Endocone port after dismantling it. The fascial defect was closed using Vicryl no 1.Finally, skin incision was closed with Prolene 2/0 interrupted sutures (Fig.1).

Post operative analgesia was provided with a combination of Paracetamol (1g PO QDS prn) and Diclofenac (50mg PO TDS prn).Clinical status of the patients, need for analgesia, body temperature and hospitalization period were observed postoperatively.

## RESULTS

The 50 patients selected underwent Single Incision Laparoscopic Cholecystectomy successfully as described earlier. The demographics described 76% of the patients selected were female (Table 3) and a mean age of  $39.8 \pm 7.5$  years with a range between 30 and 60 years (Table 4).The operative time was calculated from the incision upto the time required for wound closure at the end of the procedure and was calculated to be  $49 \pm 8$  min (Table 6). The mean pain score in the post operative period on the Visual Analogue Scale was reported under the category of 'No pain' for 28 patients (56%), 'mild pain' for 19 patients (38%) (Table 5).

Table 1: Visual Analogue Scale for pain

Patient symptoms	Pain score	Level of pain
None	0	Mild
Annoying	1	
	2	Moderate
Uncomfortable	3	
Dreadful	4	
	5	Severe
Dreadful	6	
Horrible	7	
	8	
Agonizing	9	
	10	

Table 2: Gender distribution among patients(n=50)

Male	Female
12(24%)	38(76%)

Table 3: Age distribution in years

Gender	Mean(SD)	Median(Range)
Male	41.2(7.9)	39.5(33-60)
Female	39.3(7.3)	38.5(30-59)

Table 4: 24 hour postoperative pain score

Pain	n	%age
No pain	28	56
Mild	19	38
Moderate	3	6
Severe	0	0

Table 5: Operative Time &amp; Discharge

Clinical outcome	SILS Cholecystectomy	P-Value
Mean operative time in minutes	49±8	<0.5
Mobilization time in days	Day 0	Not Significant
Day of discharge	58% for same day 42% for post op day 1	Not significant

All the patients were encouraged to mobilize 4 hours after surgery and 58% of the patients were discharged on the same day with the rest (42%) being discharged the next day. There were no instances of morbidity of postoperative complications that needed to be addressed in these patients.

## DISCUSSION

Laparoscopic cholecystectomy is now considered as the gold standard treatment for symptomatic gallstones<sup>6</sup>. This technique has shown excellent results regarding outcomes and safety in patients undergoing the procedure. As medical technology advances, more and more techniques are being devised to ensure the competency of this procedure with better cosmetic results, lesser pain postoperatively and shorter hospital stays. SILS cholecystectomy is a major step in this direction for an incision free procedure that provides better cosmesis without compromising on the safety of the procedure<sup>6,10-14</sup>. In addition to this, SILS performed by an experienced surgeon also relates to a shorter hospital stay and, hence, decreased economic burden on the hospital in this regard<sup>15</sup>.

Although this method requires a longer learning curve for training, the benefits achieved give it a favourable incentive to be practised. The technical difficulty in SILS cholecystectomy is due to the fact that there is poor ergonomics, a theorized decreased visualization of the operative field and an inadequate

retraction due to restricted instrument mobility<sup>16</sup>. Nevertheless, these problems can be conquered as the surgeon and his assistants gain experience in carrying it out. Recent Systematic reviews have showed that there were no statistically significant differences in the rates of complications or postoperative pain scores in patients when comparing the SILS technique to the standard four port laparoscopic cholecystectomy technique<sup>17</sup>.

When comparing costs, SILS is considered to be more expensive<sup>18-19</sup> despite studies carried out by Bucher et al reusing the materials in order to reduce the costs<sup>20</sup>. However, Love et al<sup>21</sup>, after reviewing the cost comparisons concluded that there was not any significant difference in cost when standard equipment was being used and the duration of the procedure was considered. The SILS procedure is still under development and hence, the costs cannot be compared to a procedure carried out in routine practice. As the usage of SILS increases, the costs may be reduced.

## CONCLUSION

Our initial experience for SILS Cholecystectomy in a tertiary care setting demonstrated it to be a safe technique although it has a longer learning curve as compared to conventional laparoscopic cholecystectomy. It can be accomplished with similar results as is the conventional laparoscopic approach with an additional favourable outcome in the form of better cosmesis.

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