

## ORIGINAL RESEARCH

# Double Incision Laparoscopic Cholecystectomy: A Step Before Single Incision Laparoscopic Cholecystectomy

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## ABSTRACT

**Introduction:** Cholecystectomy is the most common major abdominal procedure performed in now a days. Today, laparoscopic cholecystectomy is the treatment of choice for symptomatic gallstones. The recent focus has been to further minimize the invasiveness of laparoscopic surgery by reducing the number of incisions. But specialized instruments may be required for this. Double Incision Laparoscopic Surgery(DILS) may serve to fulfill that aim. DILS can be performed using refinements of existing technology, and surgeons can perform it without any new instruments, specific competence, or training. DILS may offer the advantages of reducing postoperative pain, and virtually scarless surgery.

**Material and method:** We present our experience with DILS in department of surgery of our institution. The study was a prospective study comprising of 25 patients diagnosed with cholelithiasis were planned to undergo DILC. DILC was performed by a transumbilical incision and an epigastric incision using conventional laparoscopic instruments

**Results:** The mean operative time measured as the time required to insert the trocar and close the wound, was 62.56 minutes(SD=10.14 min). Out of 25 patients undergoing DILC, 2 patients (8%) were converted to CLC and 1 patient(4%) was converted to open cholecystectomy. The mean postoperative pain score as assessed on VAS scale was 3.32,2.12 and 1 on day 1,2 and 3 respectively. The mean postoperative analgesic requirements (mg of diclofenac sodium) was 225,108 and 39 mg on day 1,2 and 3 respectively. The mean hospital stay 2.24 days. The most common complication seen was persistent pain in 2(8%) of patients.

**Conclusion:** Cosmetic outcomes of DILC were well accepted by the patients, so it can be concluded that DILC can be done in patients desiring a better cosmetic outcome and due to its easy learning curve, can be considered as a step before single incision laparoscopic surgery(SILS).

**Keywords:** Cholecystectomy, Single Incision Laparoscopic Cholecystectomy, gallstone Laparoscopic Cholecystectomy

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## INTRODUCTION

Cholecystectomy is surgical removal of Gall Bladder, it is a procedure of choice for symptomatic gall stone disease. The first cholecystectomy is done by the German Surgeon Carl Langenbuch in July 1882 Open cholecystectomy was a safe and effective treatment for both acute and chronic cholecystitis. In 1987, laparoscopic cholecystectomy was introduced by Philippe Mouret in France<sup>1</sup> and quickly revolutionized the treatment of gallstones. Laparoscopic cholecystectomy offers a cure for gallstones with a minimally invasive procedure, minor pain and scarring, and early return to full activity. Today, laparoscopic cholecystectomy is the treatment of choice for symptomatic gallstones. Since the introduction of laparoscopic cholecystectomy as the gold standard procedure to remove the gallbladder, many surgeons have attempted to reduce the number and size of ports in laparoscopic cholecystectomy to decrease parietal trauma and improve cosmetic results.<sup>2</sup> The recent focus has been to further minimize the invasiveness of laparoscopic surgery by reducing the number of incisions.<sup>2,3</sup> therefore many surgeon are now performing single incision laparoscopic cholecystectomy with single large umbilical incision but with much operative difficulty due to clashing of instrument and loss of normal ergonomics of port placement DILS can be performed using refinements of existing technology, and surgeons can perform DILS without any new instruments, specific competence, or training. DILS may offer the advantages of reducing postoperative pain,

and virtually scarless surgery.<sup>2</sup> In this study, we have presented our experience with Double Incision Laparoscopic Cholecystectomy(DILC) which can be considered as one step before SILS.

## MATERIAL AND METHODS

The study was a prospective study done in the department of surgery in our institution. Total 25 patients diagnosed with cholelithiasis were planned to undergo DILC. The patients were informed about the procedures and chances of conversion. Patients were kept fasting overnight with Intravenous fluid and the surgery was performed under general anesthesia. Routine laparoscopic instruments were used to perform DILC.

DILC was performed by a transumbilical incision and an epigastric incision using conventional laparoscopic instruments. The epigastric incision was of one cm with a 10mm port inserted through it that was used as a working port, for clip application and for the gall bladder extraction. Another incision of 1 cm was made at umbilicus and two 5mm ports were placed through it, one of which was used for the camera and another as working port on the left side. The final outcomes of the patients were evaluated.

## STATISTICAL ANALYSIS

Results are based on the descriptive statistics done with the help of SPSS version 19.

## RESULTS

A total of 25 patients were included in the study. Patients' characteristics are shown in Table 1.

The mean operative time measured as the time required to insert the trocar and close the wound, was 62.56 minutes with SD 10.14 minutes. Out of 25 patients undergoing DILC, 2 patients (8%) were converted to CLC and 1 patient (4%) was converted to open cholecystectomy. The reasons for the conversion were dense adhesions at Calot's triangle leading to unclear anatomy at Calot's and frozen Calot's.

The mean postoperative pain score as assessed on VAS scale was 3.32, 2.12 and 1 on day 1,2 and 3 respectively. The mean postoperative analgesic requirements (mg of diclofenac sodium) was 225,108 and 39 mg on day 1,2 and 3 respectively. The mean hospital stay was 2.24 days. The most common complication seen was persistent pain in 2 (8%) of patients.

S.No	Factor	Patient data
1	Age	Most common age group=41-50 yrs
2	Sex	M:F= 1:7
3	Operative technique	DILC=25 patients
4	Clinical feature	Pain in right hypochondrium=100% patients Nausea and vomiting=40% of patients Fever=12% of patients.

**Table-1:** Table showing the patients' characteristics.

Parameters	DILC
Duration of surgery(min)	62.56
Conversion rate(%)	8 (DILC to CLC) 4 (DILC to OC)
Pain score (VAS)	
Day1	3.32
Day2	2.12
Day 3	1.00
Postoperative analgesic requirement (mg of diclofenac)	
Day1	225
Day 2	108
Day3	39
Length of hospital stay (days)	2.24
Wound infection (%)	00
Persistent pain (%)	8
Bile leak (%)	00
Cosmetic outcome (Grades of surgical scar)	
Grade 1	14
Grade 2	9
Grade 3	2
DILC: Doble Inscision Laproscopic Cholecystectomy; CLC: Conventional Laproscopic Cholecystectomy; DILS: Double Inscision Laproscopic Surgery; SILS: Single Inscision Laproscopic Surgery; NOTES: Natural Orifice Transluminal Endoscopic Surgery; VAS: Virtual Analogue scale	

**Table-2:** Patient outcome after DILC

## DISCUSSION

Langenbuch introduced cholecystectomy, i.e. removal of the gallbladder with the stones in 1882.<sup>4,5</sup> This operation soon became the common surgical procedure. The first laparoscopic cholecystectomy was performed by Eric Mühe in 1986.<sup>6</sup> Three years later, it was introduced in Sweden and only a few years after that it

became the “Gold standard” for elective treatment of symptomatic gallstone disease.<sup>7,8</sup> Laparoscopic surgery is basically focussed over minimizing the trauma to tissue less hospital stay and improving cosmesis. However laparoscopic surgery is less invasive than open surgery and still requiring incisions for port placement for operating instruments. Each of these causing issues: trauma, painful, impact on final cosmetic appearance and has the potential of bleeding, organ injury, subcostal nerve irritation, interfacial haematoma formation and in long term incisional hernia development. Cosmesis is increasingly demanded by increasingly discerning patients. NOTES is an experimental surgical technique whereby scarless abdominal operations can be performed with an endoscope and instruments passed through a natural orifice (mouth, urethra, anus), then through an internal incision in the stomach, vagina, bladder or colon, thus avoiding any external incisions or scars.<sup>9</sup> The goal is to reduce postoperative pain and recovery time as much as possible, and improve cosmetic results for the patient. As a bridge between traditional laparoscopic surgery and NOTES, the recent focus has been to further minimize the invasiveness of laparoscopic surgery by reducing the number of incisions.<sup>2</sup> SILS was described as early as 1992 by Pelosi et al<sup>3</sup> who performed a single-puncture laparoscopic appendectomy, and in 1997, by Navarra et al<sup>4</sup> who performed a laparoscopic cholecystectomy via two transumbilical trocars and three transabdominal gallbladder stay suture. But SILS has a flaw in leading to swording of instruments and difficulty in clip application. DILS can be performed using refinements of existing technology, and surgeons can perform DILS without any new instruments, specific competence, or training. DILS may offer the advantages of reducing postoperative pain, and virtually scarless surgery.<sup>2</sup> The use of double incision can result in the avoidance of swording and better visualization of the field and efficient surgery. Also, it has a less steep learning curve than SILS, so it can be considered as a step before SILS. In terms of findings of present study, total of 25 patients were included in the study with a male to female ratio 1:7 and a maximum age incidence in the age group of 41-50 yrs. The most common clinical feature was pain in right hypochondrium present in 100% of patients. The duration of surgery was mean 62.56 min (SD:10.14 min). Patients had a significant satisfaction level regarding cosmetic outcome with 14 patients had a Grade I scar, 9 with Grade II and 2 patients with Grade III scar. The postoperative pain score was 3.32, 2.12 and 1 on day 1,2 and 3 respectively while postop-

erative analgesic requirement was 225, 108 and 39 mg of diclofenac respectively on day 1,2 and 3 respectively. The hospital stay was 2.24 days with SD of 0.52. Similar study was performed by Wroblewski et al<sup>3</sup>, cosmetic results were superior. They also found it to be a feasible alternative to SILC especially in that, it can be done with conventional instruments.

After the analysis of the above data, it can be seen that DILC has good outcomes with regard to pain score, postoperative analgesic requirement and cosmetic outcome, hospital stay and conversion rate. Since it is an observational study without comparison with conventional laparoscopic cholecystectomy or single incision laparoscopic cholecystectomy further randomized trial are required to compare double incision laparoscopic cholecystectomy with conventional laparoscopic cholecystectomy and single incision laparoscopic cholecystectomy so that it can be definitively established to introduce DILC in curriculum of training program of SILS as a step before under taking SILS.

## CONCLUSION

After the analysis of the data, it can be concluded that DILC can be done in patients desiring a better cosmetic outcome.

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