

## Single Incision Laparoscopic Cholecystectomy in Patients of Situs Inversus Totalis By Using Conventional Instruments

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### Abstract-

**Introduction**-Situs inversustotalis is a rare anomaly and acute abdominal conditions in these patients poses a challenge in diagnosis as well as treatment. Laparoscopic Cholecystectomy is the gold standard procedure for symptomatic cholelithiasis for years .Laparoscopic cholecystectomy procedure is refined over years to increase its efficacy, decrease complication rates and increase cosmeses . Single incision laparoscopic cholecystectomy with conventional instruments is a better suited treatment modality for symptomatic cholelithiasis with situs inversustotalis, as it is easy to do due to mirror imaging , better cosmesis , less operative time and less post operative pain.SILC has some documented advantages in comparison to four port LC..

**Methods**-Patients of symptomaticcholelithiasis with situs inversustotalis were enrolled in the study . 3 patients underwent single incision laparoscopic cholecystectomy using conventional instruments.Results were documented in form of duration of surgery ,quantity of CO<sub>2</sub> used , intra operative stone spillage , intra operative blood loss, post operative pain at 6 hour and 24 hour after the surgery ,duration of hospital stay, any postoperative complications.

**Result**-Operative time , intra operative blood loss , amount of CO<sub>2</sub> used , post operative pain score at 24 hour,intraoperatively stone spillage,all parameters were noted and it is found that cholecystectomy in situs inversustotalis patients is easy in SILC as compared to 4 port laparoscopic cholecystectomy due to mirror imaging of the structures.

**Conclusion**-SILC is emerging as a promising technique for symptomatic cholelithiasis and in patients of situs inversustotalis this technique is a boon as it is very difficult to perform conventional cholecystectomy techniques . SILC on the other hand makes this procedure relatively easier.

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### I. Introduction

Situs inversustotalis(SIT) is a rare anatomic anomaly. It is an inherent disease in which the thoracic and abdominal organs are transposed.<sup>1-2</sup> Estimated incidence is 0.001-0.01% . It is an autosomal recessive disease.<sup>3</sup> Visceral situs inversus can occur with or without dextrocardia.Kartagener syndrome is characterised by triad of situs inversus , sinusitis and bronchiectasis. In the published literature, there have been only about 40 reports of open cholecystectomy in the pre-laparoscopic era and 20 reports of laparoscopic cholecystectomy in patients with situs inversus.<sup>4,5,6</sup> Symptomatic cholelithiasis is a common surgical problem often require surgical intervention in form of laparoscopic cholecystectomy. Four port laparoscopic cholecystectomy is difficult in patients of SIT due to mirror imaging of organs in abdominal cavity , so single incision laparoscopic cholecystectomy (SILC)is a preferred treatment modality in these patients .

### II. Methods

Patients of symptomatic cholelithiasis with situs inversustotalis confirmed bydextrocardia on CXR(Figure1) , Echocardiography and USG reporting showing situs inversustotalis are operated by same team of surgeonsin the Department of General Surgery, IGMC Shimla.

Inclusion criteria for our study were:

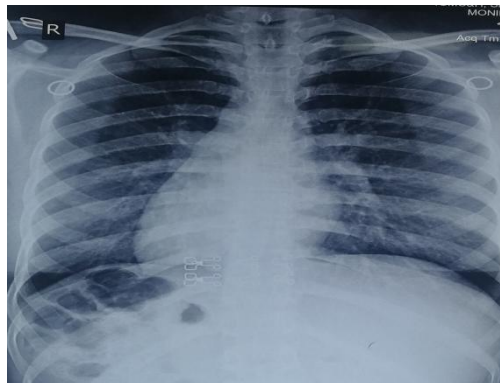
1. Age between 21 and 80
2. ASA score of <3
3. Symptomatic Gall stones with situs inversustotalis

Patients in one of the following groups were considered as high risk patients and were not included in the study.

1. Patient with BMI >40
2. Patient with choledocholithiasis with cholelithiasis
3. Previous upper abdominal surgery
4. Patient with bleeding disorder
5. Acute cholecystitis
6. Patient on warfarin
7. Patient not willing to participate in Study.

All eligible patients underwent single incision laparoscopic cholecystectomy using conventional instruments as described below-

Patient was given general anaesthesia and placed in lithotomy position with surgeon in between legs of patient or to the right side of patient and first assistant in between legs of the patient(Figure2). A curvilinear skin incision made through the inner margin of the umbilicus. Subcutaneous tunnelling was done on either side to avoid scissoring of instruments. Pneumoperitoneum was created via closed method and set at pressure of 12 mmHg. Two 10 mm trocar, one for 10 mm 30 degree laparoscope and one trocar as a working port were inserted through incision. Laparoscopy revealed, liver was present on left side, spleen on right side, stomach on right side, appendix, caecum on left side and sigmoid colon on right side. Fundus of gall bladder was retracted with the help of a suture using a straight needle which was inserted through the left 10th intercostal space in the anterior axillary line, needle was passed through seromuscular layer of the gallbladder fundus and pulled toward the anterior abdominal wall (Figure 3). This suture was used for retraction by the assistant. Hartmann's pouch was punctured and retracted using the second suture which was inserted in the epigastrium and taken out through the left hypochondrium to expose calot's triangle(Figure4). Maryland forceps was used to dissect calot's triangle. Cystic artery and duct was doubly ligated and cut. Monopolar cautery (spatula) was used to dissect gall bladder from gall bladder fossa. Gall bladder was extracted after removal of the suspending sutures from the abdominal wall through the 10 mm port. Rectus sheath was closed with the help of polyglactin suture (No.1). Umbilical incision was closed with metal clips.



**FIGURE 1.**Roentgenogram showing dextrocardia



**FIGURE 2.** Position of surgeon, first assistant and second assistant



**FIGURE 3.** Retraction of fundus of gallbladder toward anterior abdominal wall



**FIGURE 4.** Suture used for retraction of hartmann pouch

The following parameters were recorded in each group-

**A. Intraoperative Parameters**

1. Operative findings including status of gall bladder, presence of adhesions, any intra operative stone spillage.
2. Operative time calculated (in minutes) for all cases from skin incision to skin closure
3. Bleeding –Assessed through gauge visual analogue method-

% saturation of gauge piece

Size of gauge in c.m.	25% soaked	50% soaked	75% soaked	100% soaked
10x10	3 m.l.	6 m.l.	9 m.l.	12 m.l.
30x30	25 m.l.	50 m.l.	75 m.l.	100 m.l.
45x45	40 m.l.	80 m.l.	120 m.l.	160 m.l.

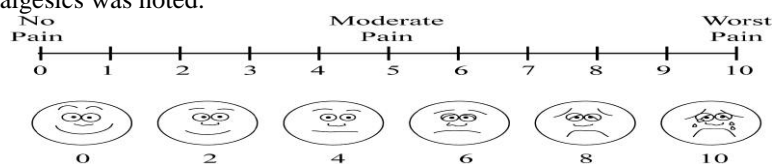
4. Quantity of CO<sub>2</sub> used

5. Use of drain

6. Conversion to Open Cholecystectomy / double port / four port cholecystectomy

**B. Postoperative Parameters**

1. Postoperative pain at 6h and 24h after surgery using visual analogue scale (VAS) used and the requirement of post operative analgesics was noted.



Correlation between Visual and verbal scale:

1-3 = mild pain

4-6 = moderate pain

7-10 = severe pain

2. Length of Hospital Stay (in days)

3. Any postoperative complications

At the end of study data was compiled and outcome parameters were studied as follows:

- Duration of surgery
- Quantity of CO<sub>2</sub> used
- Intra operative stone spillage
- Intra operative blood loss
- Post operative pain at 6 hour and 24 hour after the surgery
- Duration of hospital stay
- Any postoperative complications

### III. Results

AGE DISTRIBUTION-

Three females of age 23 ,39 and 59 years are enrolled in the study.

PARAMETERS OBSERVED	Mean value
Operative Time(min)	48.3
CO <sub>2</sub> Used ( L )	35
Blood loss ( ml)	41.6
Intraoperative stone spillage(no. of cases)	0
Conversion to four/double port/open cholecystectomy(no. of cases)	0
Pain score at 6 hour	5
Pain score at 24 hour	2
Length of hospital stay(days)	1
Post op complication	0

Mean operative time for is 48.3 min.

In terms of CO<sub>2</sub> used mean CO<sub>2</sub> used is 35 litres .

Mean blood loss is 41.6 ml .

Mean stay in hospital is 1 day.

Average pain score at 6 hours and 24 hours is 5 and 2 respectively .

In terms of stones spillage no patients had intra operative stone spillage.

No case was converted to open and there were no post operative complications noted.

### IV. Discussion

SIT is a rare congenital disorder. It was first described by fabricus in 1600. Petrius Servius in 1615 described total transposition of viscera .<sup>7</sup>In SIT there is transposition of the major thoracic organs and all the visceral organs of the abdomen to the side opposite to normal position in the body(mirror imaging). The normal development requires a 270 degree counter clockwise rotation that yields the normal anatomy. In SIT, the 270 degree rotation is in the clockwise direction.<sup>8</sup> Etiology is thought to be due to a single autosomal recessive gene of incomplete penetration. The male to female ratio is 1:1 and there is no racial predilection. SILC in SIT has been reported rarely .Uludag et al<sup>9</sup> and Bozkurt et al<sup>10</sup> reported Single incision laparoscopic cholecystectomy in situs inversus using special articulating instruments with average operating time of 75-90 minutes. Khiangte et al also done SILC in SIT using E.K.glove port.<sup>11</sup> In our case series average operative time was 48 minutes , average amount of CO<sub>2</sub> used was 35 litres and Average blood loss was 42 ml using gauge visual analogue method.<sup>12</sup> SILC is a relatively easy procedure than conventional four port LC in patient of situs inversus totalis because surgery can be performed with right hand , so procedure is less time consuming , less post operative pain with better cosmesis(Figure 5)



**FIGURE 5.**Scar of SILC

### **V. Conclusion**

Gall stones are very common now a days and are a major burden on health delivering facilities. Large number of surgeries are performed in our centre on daily basis . SILC being performed in our centre on regular basis so operative time is now comparable to four port laparoscopic cholecystectomy , it has got advantage in term of decrease post operative pain and hospital stay , so burden on health care system is decreased. With the use of harmonic ace SILC has become a safe surgery in comparison to electrocautery assisted dissection. Post operative hospital stay has decreased to some more extent , there is lesser post operative pain and less chances of post operative complications.All the above mentioned factors have decreased the morbidity and burden on health care facilities automatically decreased .So harmonic ace use has made SILC a better suited surgery and results are comparable to four port laparoscopic cholecystectomy.

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