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**Case Report**

# Three port laparoscopic cholecystectomy in situs inversus totalis: A case report

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## Abstract

Situs inversus totalis (SIT) is a rare anomaly characterized by transposition of organs to the opposite side of the body in a mirror image of normal anatomy. Location of symptoms and signs arising from a diseased organ may vary. The diagnosis as well as to operate any pathology in such patient is difficult. Laparoscopic cholecystectomy in patient with situs inversus totalis is a challenge but not a contraindication. We have reported here case of an adult woman who presented with on and off pain located at the epigastrium. Clinical examination and laboratory investigations were unremarkable. During radiological evaluation, the patient was found to have situs inversus totalis and features of chronic cholecystitis with cholelithiasis. Laparoscopic cholecystectomy was safely performed with the three-port technique in a reverse fashion by right handed surgeon. In conclusion, Laparoscopic cholecystectomy in these patients is technically more demanding and needs reorientation of visual-motor skills.

## Key words

Situs inversus totalis (SIT), Chronic cholecystitis, Cholelithiasis, Laparoscopic cholecystectomy.

## Introduction

Laparoscopic cholecystectomy is a gold standard procedure for gallstone disease. Occasionally patients present with undiagnosed situs inversus totalis and gallstone disease. Laparoscopic cholecystectomy in these patients is technically demanding and needs expertise. Conventionally, 4 port laparoscopic cholecystectomy is performed for gallstone disease but here, we presented 3 port laparoscopic cholecystectomy in situs inversus totalis patient with gallstone and the difficulties encountered during surgery and about changed ergonomics.

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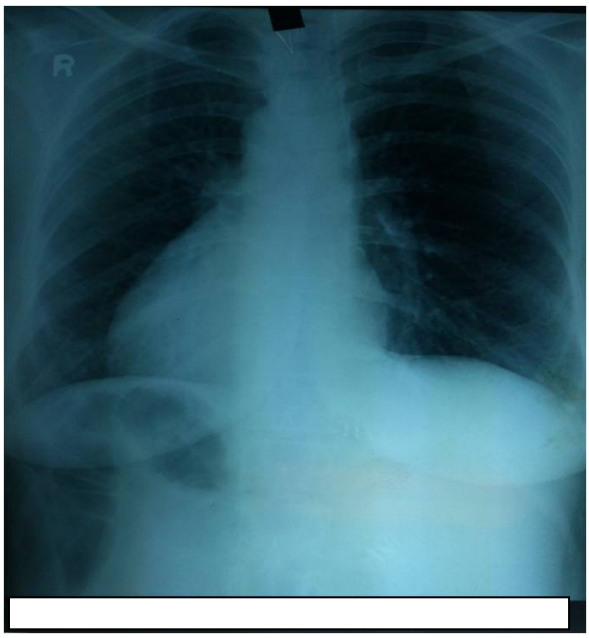
## Case report

A 35 years old female presented to Surgery Department with on and off epigastric pain since five months. Clinical examination and laboratory investigations were unremarkable. Chest X-ray showed right sided heart **(Figure - 1)** and on ultrasonography (USG) abdomen, gallbladder was found on left side while spleen on right. Echocardiography was normal. A diagnosis of chronic cholecystitis with cholelithisis with situs inversus totalis was made. Three port laparoscopic cholecystectomy was planned. The operative team and laparoscopic devices were placed in the operation theater as a mirror image configuration of normal laparoscopic cholecystectomy.

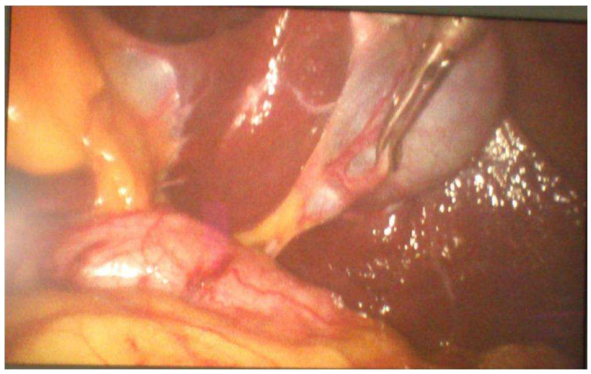
**Figure – 1:** Chest X-ray showed right sided heart.



The pneumoperitoneum was created with use of $CO_2$ by insertion of a veress needle through the subumbilical area with a pressure of 12 mmHg. Two 10 mm trocars were inserted, one in the position of the veress needle for laparoscope and other one in subxiphoid location. A 5 mm trocar was inserted at left midclavicular line.

On laparoscopic examination, the gallbladder was distended and mildly inflamed. **(Figure - 2)** The infundibulum of the gallbladder was held through the 10 mm trocar while dissection was through the 5 mm trocar with Maryland dissector. The cystic artery was then skeletanized, clipped and divided followed by the cystic duct. The gallbladder was dissected from the liver bed and extracted through the epigastric port. 10 mm ports were sutured. The postoperative period was uneventful, and the patient was discharged on the first postoperative period.

**Figure - 2:** Laparoscopic view showed left sided gallbladder.



## Discussion

Situs inversus totalis (SIT) is a rare entity. It was first reported by Fabricius in 1600 [1]. The incidence is about 1: 5000 to 1: 20000. The condition may affect the thoracic organs, abdominal organs or both. It is associated with a number of other conditions such as cardiac anomalies and Kartagener's syndrome (bronchiectasis, sinusitis, and situs inversus) [2]. There is no current evidence that situs inversus predisposes to cholelithiasis [3]. Since there is change in location of organs, the presentation of symptoms and signs also vary. The explanation for this is that the central nervous system may not share in the general transposition. In the preoperative period CT abdomen may be useful

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in determining the anomalies. Patients with situs inversus usually do not have associated extra hepatic biliary, venous, and arterial anomalies [4]. However, in patients with situs inversus partialis, there is an increased possibility of associated biliary tract and vascular anomalies and such patients may need intra operative cholangiography and a low threshold for conversion to open surgery [1]. Situs inversus is not a contraindication for laparoscopic cholecystectomy [5].

Campos and Sipes described the first case of laparoscopic cholecystectomy in a patient with situs inversus, this uncommon malformation has been challenging to surgeons [6].

The mirror image anatomy not only demands greater surgical skill but also requires careful pre-operative planning for ergonomic setting i.e. setting up the operation theatre, positioning of the surgical team, ports and instruments.

The main difficulty encountered was that the right handed surgeon had to cross hands to retract on hartmann's pouch while dissecting Calot's triangle. To overcome this issue, several alternative modifications were proposed.

- Retraction of hartmann pouch by the first assistant.
- Surgeon standing between the two abducted lower limbs of the patient [7].

We overcame this difficulty by carrying out the dissection through 5 mm port while using the 10 mm epigastric port for retraction of hartmann's pouch. This resulted in better ergonomics by avoiding crossing over of the surgeon’s hands. An added difficulty was to apply clips as the angle of the clip applicator did not fit along the direction of the cystic artery. We overcame this problem by applying clips using the left hand through the epigastric port with great precision. Alternatively clips can be applied by the right hand also taking help of first assistant for retraction of hartmann's pouch. More recently a single incision multiport laparoscopic cholecystectomy in situs inversus totalis has been reported [8].

## Conclusion

Situs inversus totalis presenting with chronic cholecystitis with cholelithiasis is uncommon. Clinical symptoms may be confusing as these patients often complain of pain either in the epigastric region or left upper abdomen. Laparoscopic cholecystectomy in these patients is technically more demanding and needs reorientation of visual-motor skills to the left upper quadrant. The right handed surgeon must appreciate that care should be taken to set up the operating theatre for better comfort and ergonomics. This case illustrates the feasibility of laparoscopic cholecystectomy with three ports only with or without modification of the technique to adapt to the mirror image anatomy in patients with situs inversus.

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