

# Laparoscopic Cholecystectomy In A Patient With Situs Inversus Totalis: Technical Difficulties and Possible Solutions.

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## Abstract

Situs inversus totalis is a rare anomaly characterized by transposition of organs to the opposite side of thorax and abdomen to form a mirror-image anatomy. These patients pose a technical challenge for surgeons even for commonly performed surgical procedures. We report a patient with situs inversus totalis for whom we performed laparoscopic cholecystectomy for the treatment of cholelithiasis with chronic cholecystitis. Diagnostic problems and technical difficulties faced by us during procedure are discussed along with experience of other authors available in the literature.

## INTRODUCTION

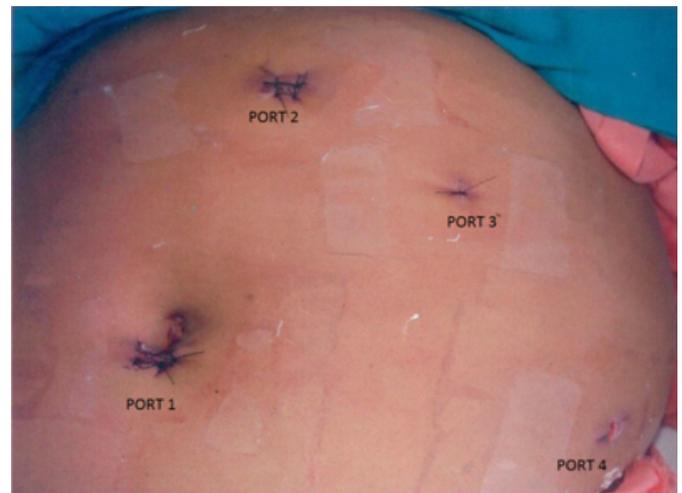
Situs inversus totalis is a rare congenital disorder occurring in 0.01% of the population.[1] It may be partial, where the transposition is confined to either the abdominal or the thoracic viscera, or complete, i.e. involving both cavities.[2] Change in anatomical position of organs not only gives rise to abnormal location of symptoms and signs, thus posing a difficulty in diagnosing the ailment, but also demands greater surgical skill. We report a case with complete situs inversus who presented with features of chronic cholecystitis and underwent laparoscopic cholecystectomy.

## CASE REPORT

A 47-year-old female presented with colicky pain in the left upper abdomen associated with nausea and dyspepsia occurring occasionally for the last 4-5 months. No other symptoms were present and abdominal examination was unremarkable. Abdominal ultrasonography revealed situs inversus with the gall bladder lying on the left side and containing multiple calculi. The patient was planned for laparoscopic cholecystectomy using standard four-port technique. Four ports on the left side of the abdomen were mirror images of those used for a right-sided gall bladder (Fig. 1).

## Figure 1

Figure 1: Postoperative image showing the position of the ports

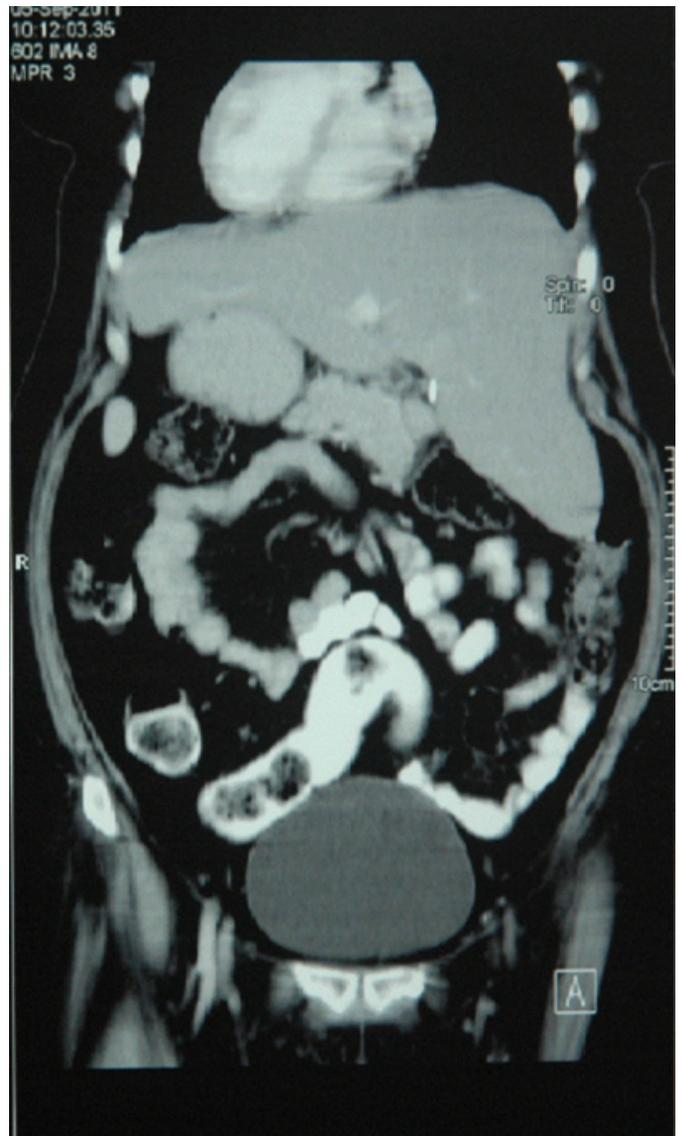


Surgeon and first assistant stood on the right side of the patient, the second assistant on the left side. The video-monitor was positioned near the head of the patient, slightly towards the left side. A pneumoperitoneum to a pressure of 12mm of Hg was created with a Veres needle inserted through the umbilical port incision. A 30-degree telescope was inserted through a 10mm umbilical port (Port-1). The peritoneal cavity was examined and the situs inversus confirmed. Another 10mm-port was placed 4cm below the xiphoid process and 1cm towards left of the midline (Port-2). A 5mm-port was inserted 5cm below the left costal margin

in the midclavicular line (Port-3). The fourth port was placed about 10cm below the left costal margin in the anterior axillary line (Port-4). A grasper inserted through port-4 was used to hold the fundus of the gall bladder and for its retraction. Being a right-handed surgeon, it was difficult to dissect through port-2. We used port-3 to dissect and port-2 for retraction of the neck of the gall bladder. Using electrocautery, adhesions were separated and Calot's triangle dissection was done to bare the cystic duct. Application of clips through port-2 was again a challenge as the angle of the clip applicator through port-2 did not fit across the direction of the course of cystic duct and artery. The gall bladder neck was grasped with a tissue grasper introduced through port-2 and the gall bladder was dissected from the fossa with a hook passed through port-3. The gall bladder was taken out through port-2. A tube drain was placed in the subhepatic space. The postoperative period was uneventful (Fig. 2).

**Figure 2**

Figure 2: Postoperative CT image suggesting situs inversus totalis (also showing the clip used for the cystic duct)



## DISCUSSION

Situs inversus is considered to have a genetic predisposition that is autosomal recessive with the defect being localized on the long arm of chromosome 14.[3] There is no evidence to suggest that gall stones are more or less common in patients with situs inversus. Presentation with left upper quadrant pain may delay the diagnosis of symptomatic gall stones.[4] It has been noted in 30% of previous reported cases of acute cholecystitis in patients with situs inversus that the pain was felt in the epigastrium alone and in 10% the pain was localized to the right upper quadrant. The proposed explanation for this is that the central nervous system may not share in the general transposition.

Previous reports have confirmed that situs inversus is not a contraindication for laparoscopic cholecystectomy.[5-7]

The major problems in performing laparoscopic cholecystectomy on a left-sided gall bladder can be 1. Reversal of role of left and right hand, 2. Application of ligaments through the epigastric port is difficult as the course of the clip applicator is more or less parallel to that of cystic duct and artery.

To counter these problems, different solutions were suggested in the available literature. The main difficulty encountered was that a right-handed surgeon would have had to cross hands to retract on Hartmann's pouch while dissecting Calot's triangle. This difficulty can be overcome this by allowing the first assistant to retract on Hartmann's pouch, while the primary surgeon dissects Calot's triangle using his right hand via the epigastric port without hindrance.[3] Alternatively, one can use the epigastric port to retract with the left hand and operate with the right hand through the lateral subcostal port.[2] We found this method to be extremely comfortable. Hartmann's pouch can be retracted upwards, medially and anteriorly to view the posterior aspect of Calot's triangle with a 30-degree scope and posterior dissection can be performed very well. The surgeon standing at the foot end, in between the legs of the patient, while the patient is in a Lloyd-Davis position, is another alternative, as is delegating to a left-handed surgeon.[2]

It was problematic for us to apply clips through the epigastric port (10mm) as the direction of the clip applicator

and the course of cystic duct and artery were parallel to each other. Angulation of the clip applicator with the course of cystic duct and artery is suitable through the midclavicular port. We suggest that one can place a 5mm-port in the epigastrium while the midclavicular port should be of 10mm-size so that clip application can be performed through the midclavicular port.

During the procedure, the greatest problem was orientation about the mirror-image anatomy of structures for which there is no technical solution except for the experience of the surgeon. Laparoscopic cholecystectomy can be performed safely in these patients.

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