

# Laparoscopic Cholecystectomy in Situs Inversus Totalis: A Case Report

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**Abstract:** Situs inversus totalis is a rare congenital disorder occurring in 0.01% of the population. It is characterized by the transposition of the major thoracic organs and all the visceral organs of the abdomen to the side opposite to normal position in the body. The liver and gall bladder are located on the left, while the stomach and the spleen are on the right. We report the first case of a successful laparoscopic cholecystectomy in a male patient with situs inversus totalis with HBsAg positive status in our hospital.

**Keywords:** Laparoscopic cholecystectomy; Situs inversus totalis; Gallstones; Difficult cholecystectomy technique.

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## I. INTRODUCTION

Symptomatic gallstones in patients with situs inversus pose diagnostic and therapeutic challenges. The presentation and management of one such male patient admitted in our CSSH SUBHARTI HOSPITAL MEERUT is discussed in this study with an emphasis on operative technique.

Situs inversus totalis is a rare defect with genetic predisposition that may present difficulties in the diagnosis and management of abdominal pathology due to mirror-image anatomy. Laparoscopic cholecystectomy is the standard treatment for symptomatic cholelithiasis; however, the technique has to be varied for the treatment of situs inversus totalis. Situs inversus totalis is a rare congenital disorder occurring in 0.01% of the population.<sup>1</sup> It is characterized by the transposition of the major thoracic organs and all the visceral organs of the abdomen to the side opposite to normal position in the body. The liver and gall bladder are located on the left, while the stomach and the spleen are on the right. The normal development requires a 270 degree counterclockwise rotation that yields the normal anatomy. In situs inversus totalis, the 270 degree rotation is in the clockwise direction.<sup>2</sup> The exact etiology is unclear; however, it 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.

It is estimated to occur in 1 in 5000–20,000 births<sup>3</sup>. Though situs inversus on its own is not pathological, it may be associated with cardiorespiratory, hepatopancreaticobiliary, gastrointestinal, neurological, orthopaedic and urological anomalies, some of which may be life-threatening.<sup>4</sup> 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>5,6</sup>

We report the first case of a successful laparoscopic cholecystectomy in a male patient with situs inversus totalis with HBsAg positive status in our hospital.

## II. CASE REPORT

A 24-year-old male presented to the surgery OPD with a few months history of intermittent left upper quadrant pain, radiating to the left scapular region and aggravated by fatty food. Imaging by an ultrasound scan and subsequently by a CT scan showed abdominal situs inversus with gall stones in a left-sided gall bladder. A pre-operative chest X-ray showed dextrocardia consistent with situs inversus but there was no evidence of bronchiectasis. All the biochemical reports of the patient were within normal limit except that the patient was Hepatitis B Antigen (HbsAg) positive.

### III. TECHNIQUE

The PAC of the patient was done and the patient was taken up for surgery under general anesthesia. The approach in the operating room required modification. The surgeon and the assistant were positioned on the right side of the patient and the scrub nurse on the left. A head-end-up and left-side-up positioning of the patient was adopted to optimize views of the gall bladder and the Calot's triangle. A 4-port technique was used – an umbilical (10 mm), a medial epigastric (10 mm) and two lateral subcostal (5 mm) ports.

Initial inspection confirmed a left-sided liver and gall bladder. There was a total situs inversus with the spleen on the right side, the greater curvature of the stomach to the right and the caecum to the left. In our technique we followed a mirror image port placement and technique that is followed in a conventional laparoscopic cholecystectomy.

The epigastric port (10 mm) was placed just to the left of midline in the subxiphoid position with the tip on the peritoneal aspect to the left of the falciform ligament. This was one of the two main operating ports and the instruments used were controlled by the left hand of the surgeon. It was used for passing the dissector, scissors, hook diathermy, clip applicator and the suction-irrigation apparatus, as necessary.

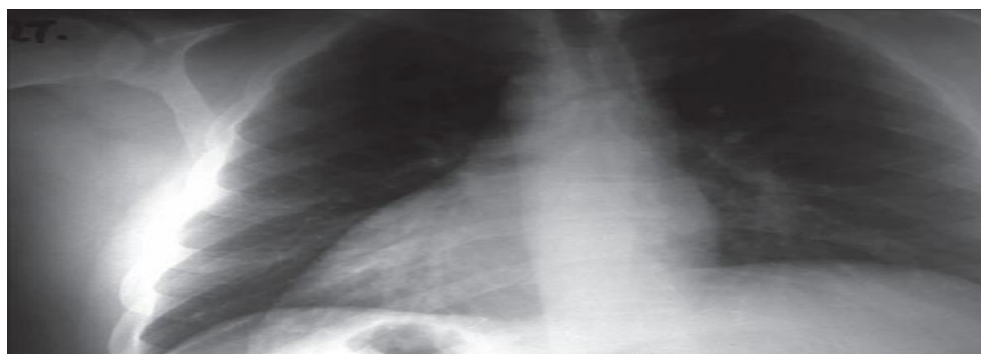
The medial of the two lateral subcostal ports (5 mm) was placed about 5 cm subcostally just lateral to the left nipple line. This was the second of the two main operating ports and was used for retraction of the Hartmann's pouch of the gall bladder. This port and its instruments were controlled by the right hand of the surgeon. The lateral subcostal port (5 mm) was placed about 5 cm subcostally close to the anterior axillary line and was used by the assistant to retract the fundus of the gall bladder cranially.

Advantage of this technique was that both extracorporeal crossing of the hands and intracorporeal crossing of the instruments was avoided.

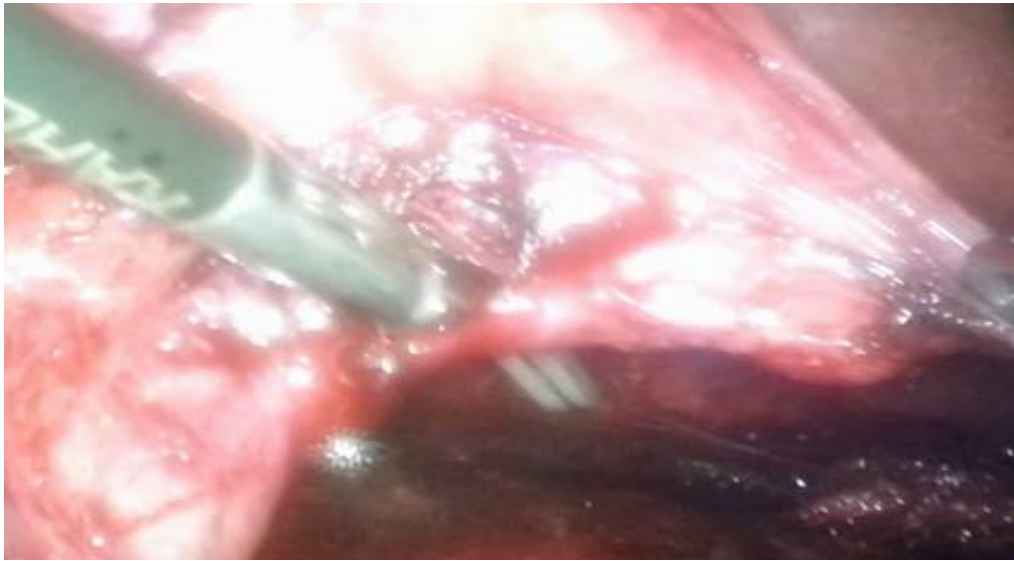
Dissection of the Calot's triangle, identification of the cystic duct–common hepatic duct junction, skeletonisation of the cystic duct and cystic artery before clipping and dissection of gallbladder proceeded as usual. There were no anomalies noted. The gall bladder was delivered through the epigastric port. Our total operating time was 55 min. The patient was successfully extubated and was shifted to recovery room. Drain was removed after 48hours and stitch removal was done on the 8<sup>th</sup> day after surgery. There was no postoperative complication.

### IV. DISCUSSION

Situs inversus totalis is an extremely rare condition and performing successful laparoscopic cholecystectomy in these patients is even rarer. It has been reported that about a third of patients with situs inversus and symptomatic gall stones may, however, present with epigastric pain and about 10% of patients may present with right-sided pain.<sup>7</sup> Laparoscopic cholecystectomy in patients with situs inversus should be performed by an experienced laparoscopic surgeon. While there is no evidence to suggest that there is an increased risk of bile duct injuries in patients with situs inversus, the orientation and ergonomic challenges may result in an increased operative time.<sup>9</sup> However, the ergonomics of a right-handed surgeon standing on the right side of the patient demand that either he crosses hands so as to allow the right hand to operate through the epigastric port or use the assistant to retract the Hartmann's pouch from the left side or as we have described here, use the epigastric port to operate with the left hand and retract with the right hand through the lateral subcostal port, but this will depend on the experience of the laparoscopic surgeon. It is much easier for a left-handed surgeon to perform laparoscopic cholecystectomy in such patients.<sup>8</sup> the surgeon standing at the foot end, in between the legs of the patient while the patient is in a Lloyd-Davis position, is an alternative, as is delegating to a left-hand.



**PHOTO 1. Chest X-ray showing dextrocardia**



**PHOTO: 2. Showing dissection of callot's triangle**



**PHOTO: 3. Showing retrieval of the gallbladder along with various ports**



**PHOTO: 4. Showing postoperative picture before removal of sutures with various port sites**

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