

CASE REPORT

Cholecystectomy in Situs Inversus Totalis

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ABSTRACT

Situs inversus totalis (SIT) involves a systemic reversal of visceral organs, complicating both clinical diagnosis and operative strategy. While laparoscopic cholecystectomy is the gold standard for cholelithiasis, its application is challenged by this rare anatomical anomaly. In cases of SIT with dextrocardia, atypical presentations and mirrored anatomy can obscure diagnosis and increase operative complexity. A 39-year-old man was diagnosed with dextrocardia via chest X-ray. Ultrasonography and computed tomography confirmed SIT, cholecystitis, and cholelithiasis. We attempted laparoscopic cholecystectomy using a modified technique involving left-handed maneuvers and adjusted port positions. However, due to dense adhesions between the gallbladder, omentum, and transverse colon, a Critical View of Safety (CVS) could not be achieved. The procedure was converted to an open cholecystectomy via a left subcostal incision. The operation went well, and our patient recovered satisfactorily.

Keywords: cholecystectomy; gallbladder; laparoscopic; situs inversus totalis

INTRODUCTION

Situs inversus (SI) is a rare autosomal recessive congenital anomaly with an estimated incidence ranging from 1 : 5,000 to 1 : 20,000 live births.¹ It encompasses a spectrum of visceral transpositions: *Situs Inversus Totalis (SIT)*, *Situs Inversus Partialis*, *situs ambiguus*. Dextrocardia is a hallmark of SIT. Laparoscopic cholecystectomy is gold standard, the mirror-image anatomy poses significant technical hurdles.² We report a case of symptomatic gallstones in a patient with SIT where laparoscopic cholecystectomy required conversion to an open procedure.

CASE REPORT

A 39-year-old male with no significant prior medical history presented with a two-year history of chronic, intermittent epigastric and left upper quadrant (LUQ) pain. The symptoms were characterized by LUQ

discomfort, nausea, and vomiting. The patient had taken taken PPI (proton pump inhibitor), and antacids multiple times for these symptoms, resulting in only transient symptomatic relief.



Figure 1: Chest X-ray showing dextrocardia

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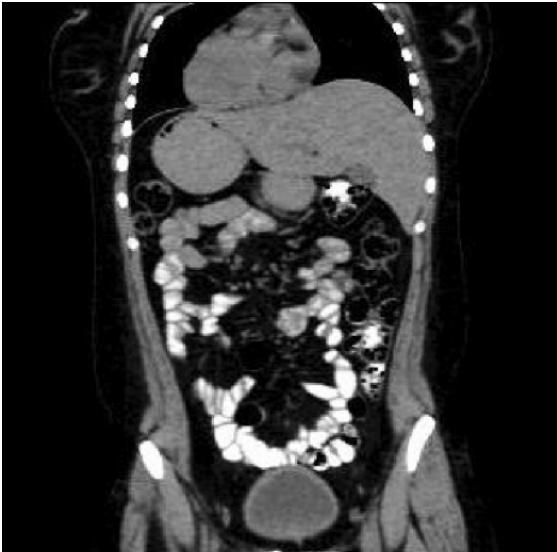


Figure 2: CT scan showing the liver on the left and the stomach and the heart on the right

On clinical examination, the patient was hemodynamically stable and appeared non-icteric. Abdominal palpation was unremarkable, with no evidence of guarding or tenderness. Laboratory investigations, including a complete blood count (CBC), renal function tests, and liver function tests (LFTs), were all within reference ranges.

Diagnostic imaging was pivotal in defining the underlying anatomy. A chest radiograph revealed *dextrocardia* accompanied by a right-sided gastric fundic gas shadow (Figure 1). Subsequent abdominal CT scan and ultrasonography confirmed *Situs Inversus Totalis (SIT)*, demonstrating complete transposition of the visceral organs, including a left-sided liver and a thick-walled gallbladder containing multiple calculus (Figure 2). Based on the diagnosis of symptomatic cholelithiasis in the setting of SIT, the patient was scheduled for an elective laparoscopic cholecystectomy.

The operation theatre was arranged exactly the mirror image of regular laparoscopic cholecystectomy. Surgeon and his camera assistant were on the right side and the monitor was on the left side ergonomically placed. First infraumbilical 11mm port was opened using Hassan technique, pneumoperitoneum was done with CO₂. Other access was established using 3 trocars. A 10mm subxiphoid port was placed at the xiphisternum to facilitate the surgeon's left-hand maneuvers. For the primary working port (surgeon's right hand), a 5

mm trocar was inserted at the left midclavicular line, 2 cm inferior to the costal margin. A third 5 mm port was positioned at the left anterior axillary line, 5 cm below the costal margin, to allow the second assistant to perform gallbladder fundus retraction.

Gall bladder was completely covered by dense adhesion of omentum and transverse colon. CVS was not possible. Conversion to open cholecystectomy was done. Calot's triangle was achieved. Cystic artery and cystic duct were identified ligated and divided. Cholecystectomy was done. The post-operative period went without any events. He was discharged after full recovery on 5th post operative day. Histopathology report of gallbladder reported the presence of gallstones with chronic cholecystitis. His follow up showed no complication till this date.

DISCUSSION

Situs inversus totalis (SIT) is a rare autosomal recessive congenital anomaly, with a global prevalence of 0.04% to 0.30%.³ Chest and abdomen viscera are trans positioned like mirror image sagittally. Diagnosis of gall stone diseases in these patients are difficult. The clinical presentation of these patients was usually left upper-quadrant pain; however, 30% of patients reportedly develop epigastric pain. Chest X-ray and Ultrasonography is very helpful in diagnosis of SIT.

Laparoscopic cholecystectomy remains the gold standard operation for treatment of gallstone diseases, even in patients with situs inversus.² In 1991, Campos and Sipes reported the first successful laparoscopic cholecystectomy in a patient with situs inversus with a symptomatic gallstone. Since then, 92 cases were reported by 2018.⁴ There are many techniques now being reported in different articles like 3 ports, 4 ports, SILS and robotic surgery. Conversion to open cholecystectomy cases is also in large numbers because of the delayed diagnosis due to SIT. No technique has been considered yet as a standard for such cases. Surgeons should choose any suitable approach taking in account meticulous dissection and critical view of safety achievement before clipping the cystic duct and artery. Intraoperative cholangiogram can be performed in such cases to visualize the anatomy and avoid iatrogenic injury. Rungsakulkij et al used

fluorescent cholangiography by administration of indocyanine green to delineate the extrahepatic biliary tree anatomy.⁵

CONCLUSION

Situs inversus totalis (SIT) can mask the typical presentation of cholelithiasis, often leading to delayed intervention and a higher incidence of open cholecystectomy. Successful laparoscopic management in these cases depends on the surgeon's ability to adapt conventional techniques to a mirrored anatomical field.

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