Case Report

Laparoscopic cholecystectomy in situs inversus totalis: A case report

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Abstract

Introduction: Situs inversus totalis (SIT) is a congenital disorder which refers to a mirror image transposition of thoracic and abdominal viscera. Diagnosis and management of cholelithiasis in patient with SIT leads to a challenge due to an underlying anatomical variation. We reported a case of a 50-year-old female patient who presented with an intermit-tent history of epigastric and left upper quadrant pain continued from a month. Clinical assessment and radiological investigations confirmed the presence of cholelithiasis with an evidence of SIT. The patient underwent elective laparoscopic cholecystectomy with no complication and she had an uneventful recovery. Various intraoperative modifications have been made to overcome the technical difficulties encountered due to an underlying anatomical variation. First successful laparoscopic cholecystectomy in patient with SIT performed in 1991. Surgeons managed to get the better of the technical difficulties by embracing adaptable changes in the techniques of conventional laparoscopic cholecystectomy. The anatomical variation in SIT can influence the localization of symptoms in patient with cholelithiasis, which leads to a delay in diagnosis and management. Laparoscopic cholecystectomy can be safely performed in these cases. However, it is considered as a technically challenging procedure and often requires technique to be altered.

Key words

Situs inversus totalis, Laparoscopic, Cholecystectomy.

Introduction

Situs Inversus is a rare congenital disorder with estimated incidence of 1:5000 to 1:20000 live births. It has an autosomal recessive inheritance [1]. Situs Inversus refers to transposition of body viscera which can be complete- both thoracic and

abdominal organs are reversed leading to mirror imaging of normal anatomical variants (totalis), or It can be partial - where either thoracic or abdominal organs are reversed (patialis) [2]. Diagnosis and management of symptomatic cholilithiasis/ chronic cholecystits in a patient with Situs Inversus totalis (SIT) might be challenging. Minimal invasive surgery like laparoscopic cholecystectomy is a preferred treatment in spite of its technical difficulties due to variation in anatomy. Here is a case of symptomatic cholelithiasis in a patient with SIT which requires laparoscopic cholecystectomy, discussion of presentation, challenge in diagnosis and feasibility and review of the surgical technique.

Case report

A 50-year-old female with unknown comorbidities presented to surgery OPD with complaints of intermittent epigastric pain since one month associated with intermittent nausea and vomiting with frequent visits to hospital (it was managed symptomatically). Clinical examination has revealed no evidence of jaundice/ abdominal tenderness. Clinical investigations, ECG-dextrocardia, Chest X-ray dextrocardia with stomach fundus gas shadow on right side (**Figure – 1**), USG abdomen and pelvis suggestive of Situs Inversus totalis, cholelithiasis (3-5 stones largest measuring 7 mm). All routine blood investigations CBC, LFT, RFT, TFT, Serum electrolyte are within normal limits. To rule out biliary tract anomalies we proceeded with MRCP which confirmed the above findings, no evidence within the biliary tree lead to a confirmation of the diagnosis of SIT.

To rule out cardiac anomalies 2D ECHO was done which exposed dextrocardia having normal LV function. The patient then posted for elective laparoscopic cholecystectomy.

The operating room was equipped and arranged as mirror image of a routine laparoscopic cholecystectomy. Monitor being placed on the left side of patient alongside first assistant, whereas surgeon and camera assistant at the right side. Abdomen painted and draped, pneumoperitoneum achieved using varess needle, 10 mm infra umbilical camera port inserted, under vision 10 mm epigastric ports held by the surgeons in their respective left hands, One 5 mm port at the left midclavicular line 2 cm below the costal margin which was used as working port for the surgeon's right hand and one 5 mm port at left anterior axillary line 5 cm from the costal margin which was used for retraction of the gallbladder fundus by the second assistant, respectively (**Figure – 2, 3, 4**).

Figure - 1: Chest X-ray - Dextrocardia, Right fundus gas shadow

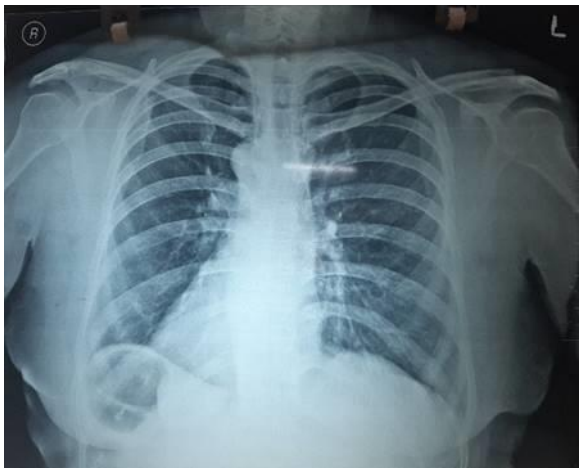
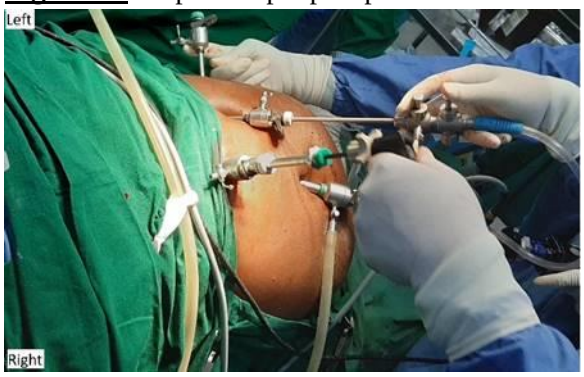


Figure - 2: Laparoscopic port position.



Inspection of the abdominal cavity confirmed the presence of situs inversus totalis with the liver and the gallbladder positioned at the left side. The Calot's triangle was identified. The peritoneum overlying the gallbladder infundibulum was then incised. Cystic duct, a cystic artery was identified and circumferentially

dissected. The cystic duct and cystic artery were then doubly clipped and divided through the sub-costal port using right hand. The gallbladder was dissected from gall bladder fossae using electrocautery and specimen retrieved from epigastric port. The total operative duration was 110 minutes which was longer than the usual time consumed in a laparoscopic cholecystectomy performed in patient without underlying anatomical variation. It can be attributed to the modification in the technique required to adjust to the mirror image anatomy.

The postoperative period was uneventful and was discharged on postoperative day 3. Histopathological examination of the gallbladder specimen revealed the presence of gallstones with changes of chronic cholecystitis. No postoperative complications were noted during follow up in an outpatient department.

Figure - 3: Calot's triangle.

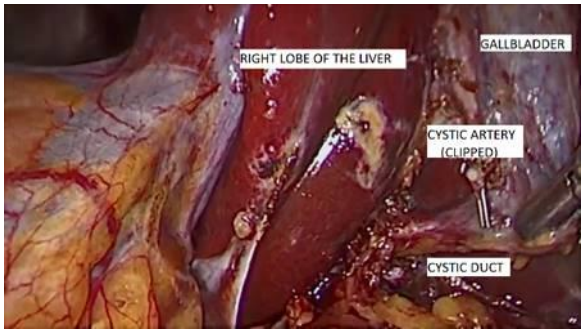
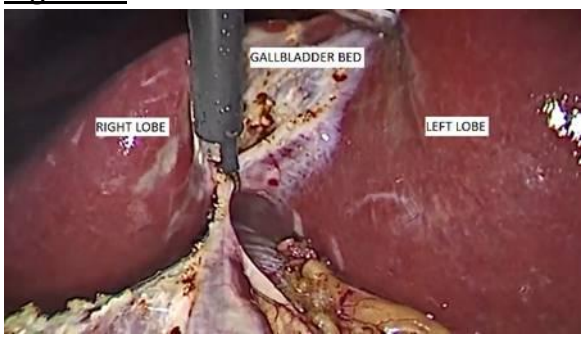


Figure - 4: Gallbladder bed.



Discussion

SIT is a congenital anomaly with a prevalence rate of 0.01% all over the globe [1, 3], which is inherited in an autosomal recessive manner. It is characterized by transposition of both thoracic and abdominal viscera [3]. It can be associated with various congenital anomalies, such as kartageners syndrome (SIT, sinusitis, bronchiectasis) and yoshikawas syndrome (SIT, bilateral renal dysplasia, pancreatic fibrosis and meconium ileus) [4]. Diagnosis of symptomatic gall stone disease in a patient with SIT is challenging due to anatomical anomaly. Patients often have unusual presentation like left upper quadrant pain, epigastric pain radiating to back leads to a delay in diagnosis and management especially in patient who are previously undiagnosed with SIT. However, there is no evidence suggesting that SIT patient are more prone to cholelithiasis [5].

Previously open cholecystectomy was the main stay treatment for cholelithiasis but in recent years after advancement of minimal access surgery laparoscopic approach is being preferred all over the world, the first of such procedure was done by mouret in 1987 since then it became gold slandered [6] in 1991 compos and sipes performed first successful laparoscopic cholecystectomy in patient with SIT [7]. Since then it has been considered as treatment of choice for cholelithiasis in SIT. However, it carries technical challenges due to its anatomical variation and requires meticulous dissection of biliary tree to avoid surgical complication [8].

In the current literature, the most frequently adopted technique is the four port technique with placement of the laparoscopic equipment, positioning of the surgical team and ports sites area mirror image of the standards used in the usual cases [9, 10]. The surgeon stands on the right side of the patient along with the camera assistant, and the first assistant stands on the left side. Left-handed instruments are used to grasp Hartmann's pouch through epigastric port and the right hand is used for dissection through the left midclavicular subcostal ports [10, 11]. Modification of this technique is reported in the literature, where the assistant retracts the gallbladder infundibulum while the surgeon performs the dissection through the epigastric port with the right hand [9]. Some authors adopted a complete mirror image approach by

using the left hand for dissection through the epigastric port, which could be more suitable option for a left handed or ambidextrous surgeon [12]. Another alternative for the surgeon to be positioned between the patient's legs while the patient is in Lloyd-Davis position [13]. Recently a laparoendoscopic single-site surgery technique was reported, which had the advantages in easier dissection using right hand and has showed up a better cosmetic result [14].

The technique of choice depends on operating surgeon taking into account of meticulous dissection, critical view achievement before clipping of cystic duct and artery. On table cholangiogram can be done in such cases iatrogenic injury should be avoided.

Conclusion

SIT is a rare congenital anomaly with mirror image transposition of thoracic and abdominal viscera due to which there can be altered presentation leading to delayed diagnosis and management though laparoscopic cholecystectomy is technically challenging. It can be performed safely in such cases with alteration of technique to the conventional laparoscopic cholecystectomy.

Ethical approval

This case report is exempt from ethical approval by our institution. Written informed consent was obtained from the patient for publication of this case report.

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