

LAPAROSCOPIC CHOLECYSTECTOMY IN SITUS INVERSUS TOTALIS: CASE REPORTS WITH REVIEW OF LITERATURE

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Abstract

The first-ever known case of situs inversus in humans was reported by Fabricius in 1600ⁱ. The possible incidence in the region is approximated between 1:5000 and 1:20000¹. It can either be partial, in which the transposition gets confined to abdominal/thoracic viscera, or it may be complete, which includes both the cavitiesⁱⁱ.

Characterized by transposition of organs to the opposite side of the body, Situs inversus totalis is a rare congenital anomaly. Due to atypical clinical picture and due to the contralateral disposition of the visceral organs in such cases of cholelithiasis, the diagnosis, as well as the treatment, becomes a tough task for the surgeon. In such patients laparoscopic cholecystectomy is undoubtedly more demanding. Even though it is more feasible but only trained and experienced laparoscopic surgeons must perform laparoscopic cholecystectomy. The skeletonizing of the cystic duct and cystic artery in Calot's triangle is a difficult task where additional time than the normal is required for locating the gall bladder.

Keywords: Cholelithiasis, laparoscopic cholecystectomy, situs inversus totalis

Introduction:

Situs inversus is a rare autosomal recessive condition with a prevalence of 0.04% to 0.30%¹. It is divided into two types namely, situs inversus partialis and situs inversus totalis. Situs inversus partialis either involves the thoracic organs and abdominal viscera. On the other hand, situs inversus totalis involves both the thoracic organs and abdominal viscera. Abnormalities such as bronchiectasis, sinusitis, and deficient tracheobronchial cilia might be associated with Situs inversus. This condition is referred to as Kartagener syndrome².

The gallbladder is on the left, whereas the stomach and spleen are on the right due to the atypical "mirror image" anatomy associated with situs inversus. The surgeons are required to be aware of the anatomy presented in the form of mirror image while diagnosing and treating the patients surgically those who develop gallbladder diseases. Descriptions based on the laparoscopic management of patients with situs inversus having symptomatic gallstones using different techniques were found²⁻⁴.

No unique pathology for situs inversus exists, but it may be associated with cardiorespiratory, hepatopancreaticobiliary, gastrointestinal, neurological, orthopaedic and urological anomalies, some of which may be life-threatening^{1, iii}. As per the evidence of the published literature, only 40 cases of open cholecystectomy in the pre-laparoscopic era have been reported. Furthermore, only 20 cases of laparoscopic cholecystectomy have been reported so far^{2, iv, v}. The variation from the norm of the sidedness of the gall bladder is attended by differences in presentation, difficulties in diagnosis and the need for modifications in operative technique as reported below.

Case Report

A 30-year old female was reported to have recurrent colicky in the left upper abdomen accompanied by nausea and flatulent dyspepsia for 2 years. No history of fever, jaundice or hospitalization was present. Abdominal examination was found to be normal. Situs inversus of all visceral was revealed through the ultrasonography of the abdomen. Location of the liver was left showing normal echotexture without

any evidence of intrahepatic biliary dilatation. The position of the gall bladder was located on the left side containing multiple calculi and was contracted as well. The bile duct was normal. The X-ray screening of chest showed that the position of the heart was at the right side. The examinations suggested that the patient having situs inversus was suffering from gallstone colic.

Laparoscopic cholecystectomy was proposed for the patient. The operating room was required to be modified for the procedure. The surgeon with the camera holder was placed to the right of the patient. The position of the scrub nurse and the first assistant were positioned to the left of the patient. A head-end-up and left-side-up positioning of the patient was adopted to optimise views of the gall bladder and the Calot's triangle. A 4-port technique was used – a 10-mm umbilical (primary) port (Port 1). A 5-mm port was placed just below to left costal cartilage in anterior axillary line, and a grasper was inserted to catch and retract fundus of the gall bladder (Port 2). A 10 mm port was inserted 4 cm below xiphoid 1 cm right to midline (Port 3), and another 5 mm port was inserted 5 cm below left costal cartilage in left midclavicular line (Port 4). Being a right-handed person, it was difficult to dissect through port 3 as been done routinely. We used port 3 to grasp neck of GB whereas port 4 for dissection. The neck of the gallbladder was grasped with a tissue forceps introduced from port 3.

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. No anomalies were noted. After the cystic duct and artery had been individually clipped and divided safely, the gallbladder was separated from its bed by electrocautery as usual and extracted in a retrieval bag through the camera port under direct vision. The operation was successfully completed in 60 minutes. The patient recovered satisfactorily and was discharged on postoperative day 6.

Discussion

It is difficult to diagnose the situs inversus patients suffering from gallstone disease. The diagnosis is more difficult in patients with an unknown history of this condition. Anatomically, as the gall bladder is located on the left side, the patients suffering from the gall stone depict left upper-quadrant pain. In 30%

of the patient epigastrium pain is reported including the patients of the current study. Further, 10% of the patients report upper quadrant pain⁵. It is termed as the classic presentation of the patients without situs inversus. Ultrasonography proves to be beneficial for these patients.

The mirror image of the anatomy of the gall bladder proves to be a hindrance in locating its orientation while laparoscopic cholecystectomy. The first challenge is to place the ports at the site of laparoscopy. The second challenge arises when the surgeon is required to reorient the images as per the surgical steps in an anatomical order that has undergone clockwise rotation. There have been reports in which the surgeon either operated with left hand or required assistance for grasping the neck of the gallbladder. However, in the current study the conventional technique was changed drastically by replacing the ports. It means that the port used for dissection was replaced with the port used for grasping the neck of the gall bladder. Only an experienced surgeon can perform it safely. Thus, situs inversus totalis does not appear to be contraindication to laparoscopic cholecystectomy⁴.

Mouret has been recognized to perform the first laparoscopic cholecystectomy in 1987. Since then, this procedure has been standardised for the treatment of gallbladder disease. Bediou et al. (2006) reported the 13th case of laparoscopic cholecystectomy for SIT in the world^{vi}. Furthermore, previous literature has proved that SIT is not considered to be a contraindication to laparoscopic cholecystectomy^{vii,viii}. The main hurdles are majorly noted for those surgeons who work with right hand. They must be aware of the anatomy while operating and must show care not to cross arms to retract Hartmann's pouch for skeletonisation of Calot's triangle. Previous authors have suggested that the assistant for optimal ergonomics carries out such retraction. Others suggest operating between the legs with the patient in a Lloyd–Davis position^{ix}.

In the current study, while operating the surgeon and the equipment were placed according to the mirror image anatomy of the patient. The surgeon was positioned on the right of the patient. Further, the left midclavicular port was assigned as the dissecting port as it became more convenient for the surgeon to operate with the right hand. The surgeon made use of the left hand to operate the grasper through the epigastric port for the best exposure. Notably, the

surgeon stands on the right side and has to move his right hand across the patient's body to operate the dissecting port; the more cephalad the position of the port, the longer the distance the surgeon must reach, which could result in early exhaustion. Therefore, we decided to relocate the left midclavicular port 5 cm caudally, which was a more ergonomic position for the surgeon. With this modification, intraoperative precision was still preserved.

Conclusion

The current case study has produced similar results as the previous ones. It has been confirmed that laparoscopic cholecystectomy can be performed safely in the patient with SIT, only if the surgeon is familiar with the mirror image anatomy of the patient.

Acknowledgement

Written consent was obtained from the patient in order to publish this case report

References

- ⁱ Varano NR, Merkin RJ. Situs inversus: review of the literature. Report of four cases and analysis of the clinical implications. *J Int Coll Surg.* 1991;33:131–5. [PubMed] [Google Scholar]
- ⁱⁱ Takei HT, Maxwell JG, Clancy TV, Tinsley EA. Laparoscopic cholecystectomy in situs inversus totalis. *J Laparoendosc Surg.* 1992;2:171–6. [PubMed] [Google Scholar]
- ⁱⁱⁱ Johnson JR. Situs inversus with associated abnormalities. Review of the literature and report of three cases. *Arch Surg.* 1949;58:149–54. [PubMed] [Google Scholar]
- ^{iv} Oms LM, Badia JM. Laparoscopic cholecystectomy in situs inversus totalis – the importance of being left-handed. *Surg Endosc.* 2003;17:1859–61. [PubMed] [Google Scholar]
- ^v McKay D, Blake G. Laparoscopic cholecystectomy in situs inversus totalis: a case report. *BMC Surg.* 2005;5:5. [PMC free article] [PubMed] [Google Scholar]
- ^{vi} Bedioui H, Chebbi F, Ayadi S, Makni A, Fteriche F, Ksantini R et al. Laparoscopic cholecystectomy in a patient with situs inversus. *Ann Chir* 2006; 131: 398–400.
- ^{vii} Yaghan RJ, Gharaibeh KI, Hammori S. Feasibility of laparoscopic cholecystectomy in situs inversus. *J Laparoendosc Adv Surg Tech* 2001; 11: 233–7.
- ^{viii} Nursal TZ, Baykal A, Iret D, Aran O. Laparoscopic cholecystectomy in a patient with situs inversus totalis. *J Laparoendosc Adv Surg Tech A* 2001; 11: 239–41.

- ^{ix} Kumar S, Fusai G. Laparoscopic cholecystectomy in situs inversus totalis with left sided gall bladder. *Ann R Coll Surg Engl* 2007; 89: 186