Management of a patient with situs inversus totalis with acute cholecystitis and common bile duct stones: A case report

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1. Introduction

Aristotle first detected Situs inversus in animals and considered it as a visitation from the gods. Dextrocardia (the heart being located on the right side of the thorax) was first seen and drawn by Leonardo da Vinci in 1452–1519. Matthew Baillie first described situs inversus more than a century later.

The normal arrangement of the human abdominal and chest organ is known as situs solitus. Situs ambiguous/heterotaxy, the major visceral organs are distributed abnormally within the chest and abdomen. Situs inversus is a condition in which the organs of the chest and abdomen are arranged in a perfect mirror image reversal of the normal positioning. The incidence is thought to be in the range of 1:10,000 to 1:20,000 according to Mayo et al.1 If the heart is swapped to the right side of the thorax, it is known as situs inversus with dextrocardia or situs inversus totalis. If the heart remains on the normal left side of the thorax, a much more rare condition, it is known as situs inversus with levocardia or situs inversus incompletus. Situs inversus is generally an autosomal recessive genetic condition. There is a 5–10% prevalence of congenital heart disease in individuals with situs inversus totalis, most commonly transposition of the great vessels. The incidence of congenital heart disease is 95% in situs inversus incompletus.

2. Case presentation

A 45-year old female presented with complaints of pain in the left hypochondrium which was intermittent and colicky for a duration of one month with intermittent fever. Examination of the patient revealed nothing significant on general examination, with no evidence of jaundice. The abdomen was soft with no palpable mass with tenderness in the left hypochondrium. She had an elevated total count of 17,500 cells/μm and an elevated alkaline phosphatase with a normal bilirubin level. Chest X-ray revealed dextrocardia (Fig. 1). Ultrasound abdomen showed situs inversus, with acute cholecystitis and choledocholithiasis.3,6 A contrast enhanced CT abdomen was done to confirm the findings (Fig. 2). And total counts were found to be elevated. The management of this patient warranted an endoscopic sphincterotomy and common bile duct stone extraction and a laparoscopic cholecystectomy.

The endoscopic sphincterotomy and common bile duct stone extraction successfully done. The findings included situs inversus...
with a normal ampulla. Cholangiogram showed mild dilatation of distal CBD and normal intrahepatic biliary radicles. A sphincterotomy was done and a 1 cm stone extracted by balloon trawling (Fig. 3).

Patient underwent laparoscopic cholecystectomy within 24 h. Laparoscopic equipments were positioned in the mirror image of their normal position. The primary surgeon and first assistant were on the patient’s right and second assistant on the left. The ports were sited as follows: camera through sub umbilical port, fundus traction through left lumbar and two working ports in the epigastric and left hypochondrium in the midclavicular line.

The most challenging factor for performing surgery in patients with situs inversus is the mirror image anatomy.\(^3\,^4\) This usually leads to some problems in orientation and dissection during the procedure since most of the surgeons are right handed. To overcome this issue, several alternative modifications have been proposed in literature:\(^1\)

1. Retraction of Hartmann pouch by the first assistant, (2) surgeon standing between the two abducted lower limbs of the patient in the so called “French” position.

Our modifications included changing the position of grasper with the dissector and dissecting the Calot’s from the posterolateral side, taking advantage of using the right hand. (Fig. 4.)

Patient recovered well post operatively and was discharged on the third post operative day.

3. Discussion

First laparoscopic cholecystectomy in a patient with situs inversus was reported by Campos in 1991, and since then 50 other cases have been reported in literature, making a point that laparoscopic procedure is not a contraindication for such patients.\(^4\,^7\) Furthermore, only 9 of these cases also had choledocholithiasis.

Only two cases of acute cholecystitis with choledocholithiasis in situs inversus have been reported so far.

4. Conclusion

We would like to conclude that laparoscopic cholecystectomy even if slightly more time consuming, can be performed safely in patients with situs inversus. Particular modifications such as strategic positioning of the surgeons and laparoscopic instruments, can be done based on the comfort of the operating surgeon. Both endoscopic sphincterotomy and common bile duct stone extraction

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**Fig. 1.** X-ray chest.

**Fig. 2.** CECT whole abdomen.

**Fig. 3.** Sphincterotomy.

**Fig. 4.** Specimen after surgery showing gallbladder and calculi.
and laparoscopic cholecystectomy are routinely done procedures which when applied in situs inversus can be tricky and requires expert management and adaptability on the part of the surgeon and endoscopist.

Conflict of interest

None.

Funding

None.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

Paper data were collected and designed by Dr. Ashwanth.P and Dr. Manoj. Paper written by Dr. Abhilash and Dr. Vignesh.

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