American Journal of Case Reports

e-ISSN 1941-5923
© Am J Case Rep, 2020; 21: e924896
DOI: 10.12659/AJCR.924896

Received: 2020.04.07
Accepted: 2020.07.11
Available online: 2020.07.30
Published: 2020.09.04

Laparoscopic Cholecystectomy in a Patient with Situs Inversus Totalis: Port Placement and Dissection Techniques

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

F Tianli Du
ABCDDEFG Abdelkader Hawasli
ABCDEFG Karen Summe
E Ahmed A. Meguid
ABCDEFG Christopher Lai
ABCDEF Moutamn Sadoun

Department of General Surgery, Ascension St. John Hospital, Detroit, MI, U.S.A.

Corresponding Author: Tianli Du, e-mail: tianlidu@gmail.com
Conflict of interest: None declared

Patient: Female, 56-year-old
Final Diagnosis: Acute cholecystitis
Symptoms: Cholelithiasis
Medication: —
Clinical Procedure: Laparoscopic cholecystectomy
Specialty: Surgery

Objective: Rare co-existance of disease or pathology

Background: Situs inversus is a rare congenital condition. Since 1991, more than 60 cases of laparoscopic cholecystectomy have been reported in patients with situs inversus. There are many different port placement techniques depending on the surgeon's preference. The fact that some of the critical dissection is easier performed by the left hand poses technical difficulty for right-handed surgeons.

Case Report: A 56-year-old woman with known situs inversus totalis and extensive past surgical history presented with acute cholecystitis. A Veress needle was used to enter the abdomen at Palmer's point. Visiport was used to place the first 5-mm port at the left mid-clavicular line. The dissection was performed in a mirror image to the usual dissection through the epigastric port.

Conclusions: There have been several techniques described in the literature to facilitate the dissection in laparoscopic cholecystectomy in patients with situs inversus totalis. We argue that the first port should be placed at the mid-clavicular line with Visiport. The other ports should be placed in mirror image of the normally placed ports, including a 12-mm epigastric port, 5-mm or 11-mm paraumbilical port, and 5-mm port at the left anterior axillary line. For dissection, we argue that it is preferable to have 2 assistants with 1 retracting the gallbladder and the other holding the camera. This allows the primary surgeon to use the dominant hand during critical dissection in this unfamiliar anatomy.

MeSH Keywords: Cholecystectomy, Laparoscopic • Cholecystitis, Acute • Situs Inversus

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/924896

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

Background

Situs inversus totalis is a rare autosomal recessive congenital disorder. The incidence ranges between 1: 10 000 to 1: 20 000 [1]. The first laparoscopic cholecystectomy in a patient with situs inversus was performed by Campos and Sipes [2]. More than 60 cases of laparoscopic cholecystectomy have been reported in patients with situs inversus totalis since then, mostly for cholelithiasis and acute cholecystitis. Some cases were done for choledocholithiasis. Besides laparoscopic cholecystectomy, other laparoscopic procedures were also reported, including low anterior resection, Nissen fundoplication, and common bile duct exploration.

Situs inversus totalis poses technical difficulties during laparoscopic operations. The uncertainty of the port placement results from the mirror image of normal anatomy. The fact that some of the critical dissection must be performed by the left hand also poses technical difficulty for right-handed surgeons.

Case Report

A 56-year-old woman with known situs inversus presented to the emergency room with nausea, severe chest pain, and epigastric pain for 3 hours. She had extensive past surgical history, including an open right salpingo-oophorectomy in 2014, a ventral hernia repair with bilateral posterior component separation and retrorectus mesh placement in 2014, an open total hysterectomy with left salpingo-oophorectomy in 2016, and an open pelvic and paraaortic lymph node dissection in 2016. An abdominal exam showed reducible incisional hernia and epigastric tenderness. An electrocardiogram (EKG), troponin, complete blood count (CBC), comprehensive metabolic panel (CMP) and lipase were ordered, which were all within normal limits except for a white blood cell count of 19. A CT angiogram of chest, abdomen, and pelvis was ordered to rule out aortic dissection and it showed only multiple gallstones. The gallbladder was further evaluated with ultrasound, which showed no gallbladder wall thickening. The next day, the patient's chest pain resolved but the epigastric pain persisted. A cholescintigraphy (HIDA) scan was performed, which showed non-visualization of the gallbladder, indicating acute cholecystitis. The risks and benefits of the surgery were explained to the patient and she understood that there was a high possibility of conversion to open cholecystectomy because of her different anatomy and extensive surgical history.

In the operating room, the patient was placed in supine position. The abdomen was accessed with a Veress needle at Palmer's point, which was at the right upper quadrant in this patient. We chose to put our first 5-mm port with Visiport at the left mid-clavicular line 2 finger-widths below the costal margin, as we could extend this incision to a subcostal incision in case we needed to convert to open surgery. There were adhesions at the left lower quadrant, pelvis, and right upper quadrant. Fortunately, there was no adhesion at the left upper quadrant. We placed an 11-mm supraumbilical port 5 cm above the umbilicus to avoid adhesions, and placed a 12-mm epigastric port and an additional 5-mm port at left anterior axillary line, as shown in Figure 1. For dissection, the primary surgeon used his right hand to dissect through the epigastric port. One assistant retracted the gallbladder fundus and infundibulum, and the other held the camera. The critical view was achieved, and clips were applied to the cystic duct and artery. The dissection was technically difficult through the epigastric port because the dissection was in a mirror image to the usual dissection. The patient did well after the surgery and was discharged on postoperative day 3.

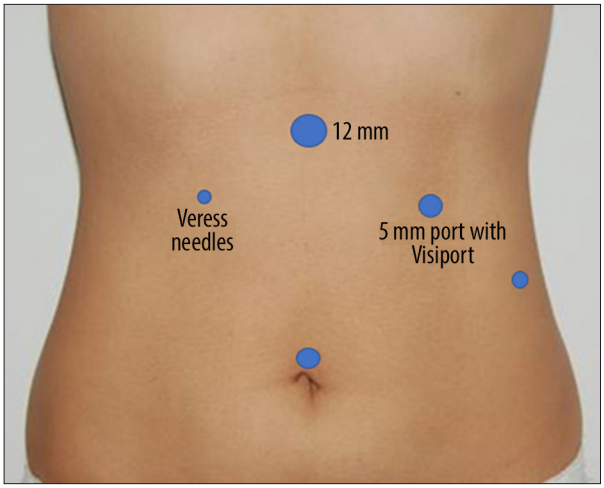

Figure 1. Veress needle at Palmer's point, first 5 mm port with Visiport at the left midclavicular line, 11 mm supraumbilical port, a 12 mm epigastric port, and 5mm port at left anterior axillary line.

Discussion

Diagnosis of acute cholecystitis can be difficult in a patient with previously unknown situs inversus. Most of these patients present with left upper-quadrant pain. About one-third of patients reported epigastric pain. Our patient, on the other hand, presented with both chest pain and epigastric pain. Rarely, right upper-quadrant pain occurs in about 10% of the cases [3]. Ultrasound and HIDA would be useful in the diagnosis.

The first laparoscopic cholecystectomy in a patient with situs inversus was performed by Campos and Sipes in 1991 [2]. More than 60 cases of laparoscopic cholecystectomy have been reported in patients with situs inversus totalis since then. There have been several techniques described in the literature to

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]

facilitate the dissection in laparoscopic cholecystectomy in patients with situs inversus totalis. Most of the surgeons chose to place ports the total mirror image, as in the patients with normal anatomy. They used their right hand to retract the infundibulum, and used the left hand to dissect in the epigastric port. In one case report in Brazil, an experienced surgeon innovated by using 3 ports technique, with the epigastric port, supraumbilical port, and left mid-clavicular port. The surgeon would retract the gallbladder with the right hand and do dissection with his left hand [4]. Some surgeons felt that it was challenging to use the non-dominant hand in critical dissection; therefore they would have the assistants retract the infundibulum, which allowed the primary surgeon to dissect using the right hand [5]. Some surgeons would retract the gallbladder infundibulum through the epigastric port, while using the right hand to do the dissection through the left mid-clavicular port, placing the patient either in supine position or lithotomy position [6–8]. To better visualize the anatomy during resection, some surgeons suggested using fluorescence cholangiography [9].

In our case, we had 2 assistants retracting the gallbladder, so the primary surgeon could use his right hand for dissection. We felt that it is important for the primary surgeon to use the dominant hand for dissection, especially in patients with unfamiliar anatomy. Our patient not only had situs inversus, but had an extensive surgical history as well. We had to choose our entry point wisely. A Veress needle was used to access the abdomen at Palmer's point, which was on the right side. The Visiport was a very helpful tool to use when placing the first port at the left mid-clavicular line with potential extensive adhesions. We argue that the first port should be placed at the mid-clavicular line 2 finger-widths below the costal margin with a Visiport in the patient with extensive surgical history and situs inversus, so the entry site is away from adhesions and easy to be converted to open subcostal incision if needed. The other ports should be placed in mirror image of the normally placed ports, including a 12-m epigastric port, a 5-mm or 11-mm paraumbilical port, and a 5-mm port at the left anterior axillary line. For dissection, we agree with Lochman et al. that it is preferable to have 2 assistants with 1 retracting the gallbladder and the other holding the camera. This allows the primary surgeon to use the dominant hand during critical dissection in this unfamiliar anatomy. Lastly, we suggest that the surgeon can try dissection from the left mid-clavicular port if dissection is difficult through the epigastric port, which was also recommended by Phothong [6]. This can allow the surgeon to access the cystic duct and artery from a better angle.

Conclusions

Situs inversus and adhesions pose technical difficulties during laparoscopic procedures. During laparoscopic cholecystectomy in a patient with situs inversus, we recommend using a Veress needle to access the abdomen at Palmer's point. The first port should be placed at the left mid-clavicular line with a Visiport. To facilitate the dissection, the primary surgeon should use the dominant hand for critical dissection through the epigastric port, while having 2 assistants retract the gallbladder and hold the camera.

References:

1. Ahmed Z, Khan S, Chhabra S et al: Our experience with surgery in situs inversus: Open peptic perforation repair and laparoscopic cholecystectomy in 1 patient and 3 patients respectively. Int J Surg Case Rep, 2016; 29: 34–38
2. Campos L, Sipes E: Laparoscopic cholecystectomy in a 39-year-old female with situs inversus. J Laparoendosc Surg, 1991; 1: 123–25
3. Lochman P, Hoffmann P, Koci J: Elective laparoscopic cholecystectomy in a 75-year-old woman with situs viscerum inversus totalis. Wideochir Inne Tech Maloinwazyjne, 2012; 7(3): 216–19
4. Fernandes MN, Neiva IN, de Assis CF et al: Three-port laparoscopic cholecystectomy in a Brazilian Amazon woman with situs inversus totalis: Surgical approach. Case Rep Gastroenterol, 2008; 2: 170–74
5. Alam A, Santra A: Laparoscopic cholecystectomy in a case of situs inversus totalis: A review of technical challenges and adaptations. Ann Hepatobiliary Pancreat Surg, 2017; 2: 84–87
6. Phothong N, Akaraviputh T, Chinswangwatanakul V, Trakarnsanga A: Simplified technique of laparoscopic cholecystectomy in a patient with situs inversus: A case report and review of techniques. BMC Surg, 2015; 15: 23
7. Hall TC, Barandiaran J, Perry EP: Laparoscopic cholecystectomy in situs inversus totalis: Is it safe? Ann R Coll Surg Engl, 2010; 92: W30–32
8. Fanshawe A, Qurashi K: Laparoscopic cholecystectomy for gallstone pancreatitis in a patient with situs inversus totalis. J Surg Case Rep, 2017; 2017(2): rjx003
9. Rungsakulkij N, Tangtawee P: Fluorescence cholangiography during laparoscopic cholecystectomy in a patient with situs inversus totalis: A case report and literature review. BMC Surg, 2017; 17(1): 43

Indexed in: [PMC] [PubMed] [Emerging Sources Citation Index (ESCI)] [Web of Science by Clarivate]