

Laparoscopic Cholecystectomy after Acute Biliary Pancreatitis in a Patient with Situs Inversus Totalis

Mehmet Kostek and Emir Capkinoglu

Department of General Surgery, University of Health Sciences, Sisli Hamidiye Etfal Research and Education Hospital, Istanbul, Turkey

ABSTRACT

Situs inversus totalis (SIT) is a rare disorder defined as symmetrical transposition of thoracic and abdominal organs. Laparoscopic cholecystectomy (LC) is a routine surgical operation and gold standard for symptomatic gallstones. LC can be challenging in SIT due to patient positioning on the operating table and the surgeon's operating position, especially for right-handed surgeons. In this case, we share our experience of a 60-year male with a history of SIT presenting with acute epigastric pain. Serum amylase and lipase were increased and imaging studies showed multiple millimetric calculi in gallbladder. The patient was diagnosed as having acute biliary pancreatitis and admitted to the surgery ward. Intravenous fluids and symptomatic treatment were given. The patient recovered and a delayed LC was planned. During the operation, trocar sites were mirror images of routine LC and the operation was completed without complications. Diagnosis of acute abdominal pain and abdominal surgery in SIT patients can be demanding. Various transformations in standard LC are possible and SIT is not a contraindication for LC

Key Words: Laparoscopy, Cholecystectomy, Situs inversus totalis, Pancreatitis, Gallbladder.

How to cite this article: Kostek M, Capkinoglu E. Laparoscopic Cholecystectomy after Acute Biliary Pancreatitis in a Patient with Situs Inversus Totalis. *J Coll Physicians Surg Pak* 2022; **32**(JCPSPCR):CR113-CR115.

INTRODUCTION

Situs inversus totalis (SIT) is an infrequent disorder characterised by the symmetrical transposition of abdominal and thoracic organs.¹ SIT has an autosomal recessive inheritance and can be accompanied by Kartagener's syndrome, which is defined as deficient tracheo-bronchial cilia and related diseases.^{1,2} Incidence of SIT is approximately 1 in 5,000 to 10,000.^{2,3} There is no study in the literature that proves increased incidence of cholelithiasis in SIT patients.⁴

Diagnosis of acute abdominal pain can be misleading in patients with SIT. Most of the adult patients are aware of their situation and it can be helpful during physical examination. Imaging studies show anatomic transposition and prove SIT before treatment starts.

Laparoscopic cholecystectomy (LC) has become the gold standard operation for symptomatic cholelithiasis and chronic cholecystitis since Mouret performed it for the first time in 1987.^{4,5} Currently, LC is one of the most commonly performed surgical procedures by general surgeons.

Due to anatomical transposition in patients with SIT, LC is more demanding than routine operation and it requires improved surgical, visual and motor skills.

In this case report, we like to share our experience in the treatment strategy of a patient with a history of acute biliary pancreatitis and SIT.

CASE REPORT

A 60-year male presented with acute abdominal pain. The pain was mostly in the epigastric area and was radiating to his back. The pain started one hour after dinner and the patient had complaint of nausea but did not vomit. The patient had no jaundice or fever but known history of SIT and a coronary artery bypass grafting operation 3 years ago. The patient had no history of abdominal surgery. The patient was using acetylsalicylic acid, atorvastatin and metoprolol. During the physical examination, vital signs were stable and there was no jaundice. On abdominal examination, there was epigastric tenderness and abdominal rigidity but no rebound tenderness. Murphy's sign was negative. On laboratory test, white blood cell count was 7.9×10^9 /L (Normal: 4.5×10^9 /L to 10.5×10^9 /L), Aspartate Transaminase, 432 U/L (Normal <45 U/L), Alanine aminotransferase, 383 U/L (Normal <45 U/L), total bilirubin, 1.8 mg/dL (Normal: 0.3-1.2 mg/dL), direct bilirubin, 0.65 mg/dL (Normal <0.2 mg/dL), amylase, 262 U/L (Normal: 28-100 U/L), and lipase was 441 U/L (Normal <67 U/L). On abdominal ultrasonography, the liver and gallbladder were seen on the left side. The wall of the gallbladder was normal and there were multiple millimetric calculi in the gallbladder. The diameter of the common bile duct

Correspondence to: Dr. Mehmet Kostek, Department of General Surgery, University of Health Sciences, Sisli Hamidiye Etfal Research and Education Hospital, Istanbul, Turkey
E-mail: dr.mkostek@gmail.com

Received: December 01, 2020; Revised: January 06, 2021;
Accepted: April 20, 2021

DOI: <https://doi.org/10.29271/jcpsp.2022.JCPSPCR.CR113>

and intrahepatic bile ducts were normal. He underwent abdominal computer tomography to evaluate pancreas. There was no oedema, necrosis or pseudocyst and the patient was admitted to the general surgery ward with a preliminary diagnosis of acute biliary pancreatitis (Figure 1).

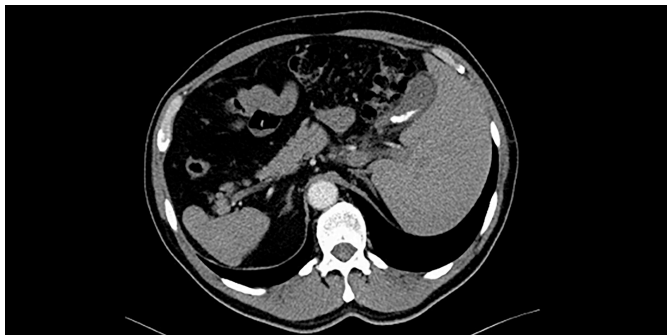


Figure 1: An image of abdominal CT scan shows multiple millimetric calculi inside of gallbladder.

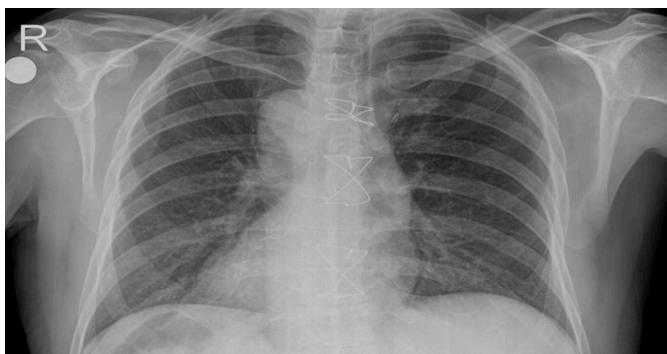


Figure 2: Chest X-Ray shows dextrocardia of patient with situs inversus totalis.

The patient was treated with intravenous fluids and symptomatic treatment. After amelioration of physical signs and laboratory results, he was discharged on the fifth day. Delayed cholecystectomy was planned 6 weeks after the first symptoms.

At 6 weeks, the patient was prepared for anaesthesia and underwent a chest x-ray which also showed dextrocardia (Figure 2). The patient was admitted for elective surgery. Operation room was prepared as a mirror image of standard LC. Diathermy and laparoscopy tower which includes a monitor, insufflation system and carbon dioxide tube replaced to the left side of the patient. During the operation, operator and the first assistant who used camera were on the right side and the second assistant on the left side of the patient. First 10 mm trocar was placed infraumbilically with Hasson's open technique and insufflation was started (Figure 3). Operation was continued under 13 mmHg pressure of carbon dioxide. Patient was positioned on reverse-Trendelenburg and slightly turned to the operator on the right side. Infraumbilical port was used for the camera. SIT was confirmed by exploring the abdomen (Figure 4). Second 10 mm trocar was placed 3 cm inferior to the xiphoid bone under direct vision. First 5 mm trocar was placed 7 cm inferior to the intersection of the left midclavicular line and costal arch. Second 5 mm trocar was placed 5 cm inferior to the intersection of left anterior axillary line and costal arch. Fundus of the gall-

bladder was hung with a clinch which was entered into the abdomen by second assistant through 5 mm trocar. A grasper was entered into the abdomen through 10 mm epigastric trocar and a laparoscopic hook was entered through first 5 mm trocar. Dissection was started from Calot's triangle and Hartmann's pouch was manipulated by grasper at the left hand of the operator. Principles of critical view of safety were applied and 10 mm titanium clips were used for closing cystic artery and cystic duct (1 clip for distal and 2 clips for proximal). During clipping, grasper was replaced to the midclavicular 5 mm port and clipping device was entered through epigastric port. After clipping, cystic artery and duct were divided by the laparoscopic scissor. Gallbladder was separated from the liver and placed in a specimen retrieval bag. Specimen was removed through infraumbilical trocar site and fascial defects at the 10 mm-trocar sites were closed by non-absorbable sutures. Total operation time was 60 minutes and estimated blood loss was approximately 10 millilitres.

The patient had no complication after surgery and spent the night at the general surgery ward. He was discharged the next day postoperatively. At 6 months of follow-up, there was no complaint or complication of surgery.



Figure 3: Trocars sites were marked on patient's abdomen.

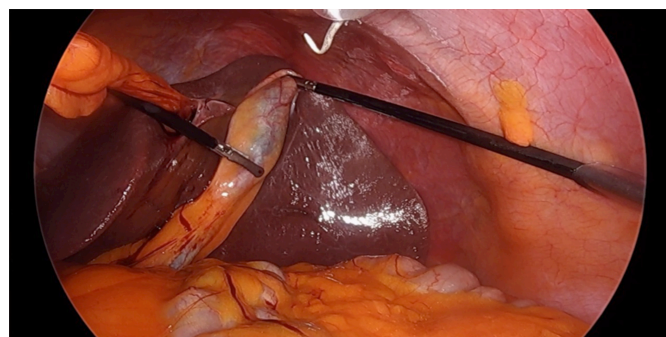


Figure 4: Intraoperative image of gallbladder in a patient with situs inversus totalis.

DISCUSSION

LC is the gold standard technique for symptomatic gallstones and one of the most commonly performed surgical operations around the world.⁵ SIT is a rare congenital malformation. Obviously, this condition needs a different perspective when LC is planned by the surgeon. Since Campos and Sipes⁶ reported the first case, surgeons are more encouraged about performing LC in SIT patients. As the reported cases are increasing, SIT is no more a contraindication for LC.

Symmetrical transposition in the abdominal organs comes with a diagnostic challenge in symptomatic patients. Especially in patients who are unaware of their anatomical variation, acute pain can be misleading for differential diagnosis. In one reported case, spontaneous gallbladder perforation was misdiagnosed as hollow viscus perforation due to a gas image under the right dome of the diaphragm at the abdominal X-ray imaging in a SIT patient.⁷ Our patient had already known SIT and we had no difficulty for diagnosis.

Although LC is a routine operation, this technique encounters diverse challenges in SIT patients. Position of the trocars were the mirror image of standard LC in this case. The surgeon was right-handed, therefore, he preferred using laparoscopic grasper with his left hand to manipulate Hartmann's pouch. Dissection of Calot's triangle was mostly performed with the laparoscopic hook and dissector, and the surgeon used his right hand for this process. During dissection of the right side of gallbladder, laparoscopic devices were crossed but the operation was completed uneventfully.

Various methods have been described in the literature to avoid crossings of the devices, such as manipulation of Hartmann's pouch by the second assistant with a laparoscopic grasper and dissection of Calot's triangle by the surgeon with his right hand or changing trocar sites.^{8,9} Also, it is suggested in the literature that surgeons can operate between the legs of patients.¹⁰ In our case, none of these variations were used but the operation was challenging and took longer than routine LC operation. In our hospital, we mostly use 10 mm laparoscopic clip applicator and we suggest using 5 mm trocar at the epigastric site and 10 mm trocar at the mid-clavicular site. This change can give better angle and easy use of clip applicator with the surgeon's right hand. Reasons for the increased operation time were working at a mirror-imaged position of a regular operation and making a more meticulous dissection for this special patient in case of any abnormalities.

The safety of the patients is the utmost priority during operation and in this rare situation, fundamental principles for a safe LC were followed. There is a possibility of increased incidence of vascular anomalies in SIT patients;¹¹ therefore, during the operation meticulous dissection was done to avoid any vascular injuries.

In conclusion, SIT is not a contraindication for LC. Although this technique is challenging in patients with SIT, it can be performed with various alterations in position and trocar entrance sites. Changes in organ positions can cause difficulties in differential diagnosis and cautious dissection is necessary to avoid any injuries during operation.

PATIENT'S CONSENT:

An informed consent was taken from the patient.

COMPETING INTEREST:

The authors declared no competing interest.

AUTHORS' CONTRIBUTION:

MK, EC: Design of the work, interpretation and analysis.

MK: Drafting of the work.

EC: Critical revision.

All the authors have approved the final version of the manuscript to be published.

REFERENCES

1. Arya SV, Das A, Singh S, Kalwaniya DS, Sharma A, Thukral BB. Technical difficulties and its remedies in laparoscopic cholecystectomy in situs inversus totalis: A rare case report. *Int J Surg Case Rep* 2013; **4(8)**:727-730. doi.org/10.1016/j.ijscr.2013.05.012.
2. Ali MS, Attash SM. Laparoscopic cholecystectomy in a patient with situs inversus totalis: Case report with review of literature. *BMJ Case Rep* 2013; **2013**:bcr2013201231. doi.org/10.1136/bcr-2013-201231.
3. Uludag M, Yetkin G, Kartal A. Single-incision laparoscopic cholecystectomy in situs inversus totalis. *JSLs* 2011; **15(2)**:239-43. doi:10.4293/108680811X13071180407032.
4. Salama, IA, Abdullah MH, Houseni M. Laparoscopic cholecystectomy in situs inversus totalis: Feasibility and review of literature. *Int J Surg Case Rep* 2013; **4(8)**:711-5. doi.org/10.1016/j.ijscr.2013.02.030.
5. Coccolini F, Catena F, Pisano M, Gheza F, Fagiuoli S, Di Saverio S. et al. Open versus laparoscopic cholecystectomy in acute cholecystitis. Systematic review and meta-analysis. *International J Surgery (London, England)* 2015; **18**:196-204. http://doi.org/10.1016/j.ijsu.2015.04.083.
6. Campos L, Sipes E. Laparoscopic cholecystectomy in a 39-year-old female with situs inversus. *J Laparoendosc Surg* 1991; **1(2)**:123-6. doi.org/10.1089/lps.1991.1.123.
7. Kumar S, Kumar S, Kumar S, Gautam, S. Spontaneous gallbladder perforation in a patient of situs inversus totalis, misdiagnosed as perforation peritonitis due to gas under the right dome of the diaphragm. *BMJ Case Rep* 2015; **2015**:bcr2014208003. doi.org/10.1136/bcr-2014-208003.
8. AlKhilawy O, Al Muhsin AM, Zakarneh E, Taha, MY. Laparoscopic cholecystectomy in situs inversus totalis: Case report with review of techniques. *Int J Surg Case Rep* 2019; **59**:208-212. doi.org/10.1016/j.ijscr.2019.05.050.
9. Aydin U, Unalp O, Yazici P, Gurcu B, Sozbilen M, Coker A. Laparoscopic cholecystectomy in a patient with situs inversus totalis. *World J Gastroenterol* 2006; **12(47)**:7717-9. http://doi.org/10.3748/wjg.v12.i47.7717.
10. Yaghan RJ, Gharaibeh KI, Hammori S. Feasibility of laparoscopic cholecystectomy in situs inversus. *J Laparoendosc Adv Surg Tech A* 2001; **11(4)**:233-7. doi.org/10.1089/109264201750539763.
11. Alsabek MB, Arafat S, Aldirani A. A case report of laparoscopic cholecystectomy in situs inversus totalis: Technique and anatomical variation. *Int J Surg Case Rep* 2016; **28**:124-6. doi.org/10.1016/j.ijscr.2016.09.004.

• • • • •