OPEN ACCESS Freely available online

Surgery: Current Research

Case Report

Case Report: Laparoscopic Cholecystectomy in a Patient with Situs Inversus

Usama Mahmood[1], Raja Khalid Shabbir[1*], Ramlah Ghazanfor[1], Sara Malik, Khawaja Rafay Ghazanfar[2], Ahmed Mujtaba Malik[1], Maham Tariq[1], Mehwish Changeez[1], Javaria Malik[3]

[1]Holy Family Hospital, Rawalpindi, Pakistan; [2]Lahore Medical College, Pakistan; [3]DHQ Hospital, Rawalpindi, Pakistan

ABSTRACT

Situs inversus represents abnormal anatomy of thoracic and abdominal organs. It is referred to as "mirror-imaging" of major organs of the body. This is a case report of a patient with situs inversus having cholelithiasis who underwent successful laparoscopic cholecystectomy. Management of such patients requires thorough investigations and meticulous surgical technique.

Keywords: Situs inversus; Situs inversus totalis; Mirror-image; Cholelithiasis; Case report; Laparoscopic cholecystectomy

INTRODUCTION

Situs inversus, also known as situs oppositus or transverus, is a congenital autosomal recessive condition [1] in which the normal anatomical position of major abdominal and thoracic organs of the body is reversed [2]. Situs inversus is rare with an incidence of around 1:10,000 to 1:20,000 population [3]. This mirroring of organs poses difficulty in diagnosing and managing different abdominal diseases [4]. The preferred investigation for the diagnosis of situs inversus is CT scan [5], however, radiography and/or ultrasonography can also be used [6].

This case report focuses on the management of a patient with situs inversus in the setting of chronic calculous cholecystitis.

Laparoscopic cholecystectomy is the treatment of choice of calculous cholecystitis but this technique becomes increasingly difficulty in situs inversus patients because reversal of normal visceral anatomy is associated with a complete change in surgeon's direction of approach and positioning [7].

CASE REPORT

A 45 years old female patient presented in surgery OPD of Holy Family Hospital, Rawalpindi on 16th October 2019 with a five year history of on and off pain in left hypochondrium and vomiting especially after intake of fatty meals. She gave a history of open cholecystectomy through right subcostal incision at a private setup fifteen years ago. There was no record available ofthis surgery and her symptoms persisted even after the procedure.The patient had no comorbids. Her general physical examination was unremarkable. She was vitally stable and slightly obese. Abdominal examination revealed a scar mark in right hypochondrium and mild tenderness in left hypochondrium. In chest examination, S1 and S2 were heard in right 5th intercostal space. We performed an ultrasound abdomen which showed situs inversus (with liver and gall bladder on left side, spleen on right side), cholelithiasis and hepatosplenomegaly (Figure 1).

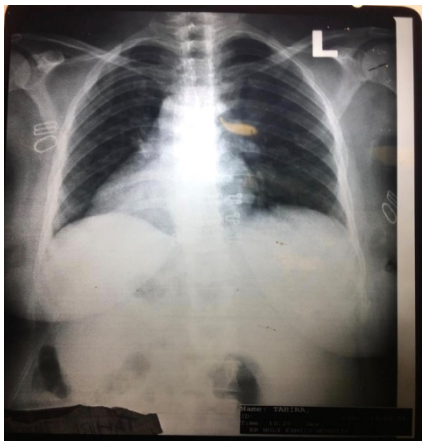

Figure 1: Chest x-ray showed dextrocardia.

Her baseline labs including liver function tests were normal. A CT scan was performed that confirmed dextrocardia, left sided

Correspondence to: Raja Khalid Shabbir, Holy Family Hospital, Rawalpindi, Pakistan, Tel: +92 3123338777; E-mail: khalid.raja@live.com

Received date: May 21, 2020; **Accepted date:** June 7, 2020; **Published date:** June 17, 2020

Citation: Mahmood U, Shabbir RK, Ghazanfor R, Malik S, Ghazanfar KR, Malik AM, et al. (2020) Case Report: Laparoscopic Cholecystectomy in a Patient with Situs Inversus. Surgery Curr Res 10:106. doi:10.35248/2161-1076.20.10.106

Copyright: © 2020 Mahmood U, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

liver, spleen in the right hypochondrium which was enlarged (Figure 2). Portal and hepatic doppler study came out to be normal.

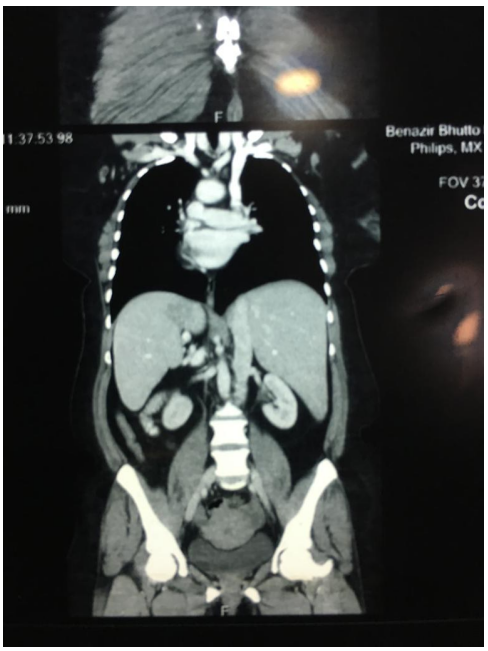

Figure 2: CT scan showing dextrocardia, left sided liver, spleen in the right hypochondrium which was enlarged.

After anesthesia fitness and informed consent patient was booked for elective laparoscopic cholecystectomy. Operation theatre staff was informed about the uniqueness of the case and to make suitable changes in the placement of laparoscopic tower. Anaesthesia was induced with propofol 2.5 mg/kg/min, fentanyl 2 μ g/kg, and suxamethonium 0.1 mg/kg. The position of the operative team as well as that of laparoscopic devices was reversed keeping in mind the reversed anatomy of the patient. The surgeon and the cameraperson stood on the patient's right side while the assistant on the left. The patient was laying in the supine position on the operating table with the head end elevated and tilted towards the right (Figure 3).

Figure 3: The patient supine position on the operating table with the head end elevated and tilted towards the right.

After pneumoperitoneum (CO_2) was created with the help of a veress needle, standard four ports were inserted. Two 10-mm ports were placed in the supraumbilical and epigastric regions and two 5 mm ports were placed in the left mid- clavicular line and left anterior axillary line at the level of umbilicus. The camera showed the liver and gallbladder on the left side, the spleen and the greater curvature of the stomach on the right side while the caecum was present in the left hemiabdomen. This confirmed that the patient was a case of situs inversus totalis.

Through the 5-mm left anterior axillary line port a grasper was inserted to grasp and push in the cephalic direction the fundus of the gallbladder, this was done by the assistant standing on the left side of the patient.

The surgeon's left hand was used to retract the Hartmann's pouch initially and later to clip the cystic duct and cystic artery after achieving duplex view. The clip applicator and the retractor were inserted through the epigastric port. The cystic artery was present on the left side of the cystic duct.

The surgeons right hand was used to dissect the calot's triangle in order to identify the cystic duct and cystic artery, to cut the cystic duct and cystic artery after clipping the two and to separate the gall bladder from the liver bed. Maryland dissector, scissors and ligasure device were inserted through the left mid-clavicular port.

The gallbladder was taken out through the 10-mm epigastric port using a grasper which was in the surgeon's left hand. The gallbladder was then placed in the specimen jar. A drain was placed in left subhepatic space through the left anterior axillary port and wounds were closed using subcutaneous prolene suture. Extubation was smooth. Patient was shifted to the post-anesthesia care unit (PACU). Postoperative analgesia was maintained with inj toradol 30 mg IV and provas 1 g IV. The postoperative course in PACU was uneventful. Drain was removed after 24 hours and patient was discharged on the second post-operative day.

DISCUSSION

Normal anatomy of viscera in the human body is known as situs solitus. Reversal of normal anatomy or mirror-image of situs solitus is known as situs inversus which can either be total or partial [8].

Hieronymus Fabricius, an Italian anatomist and surgeon known as The Father of Embryology, was the first to report a case of situs inversus in the 1600s. Its incidence, in literature, is reported to be 1:5000-1:20,000.

Most of the patients do not manifest any symptoms making the diagnosis a challenge. Those who have symptoms usually complain of pain in the left upper quadrant of the abdomen or less commonly in the epigastric region. It is important to note that approximately 10% of the patients also complain of pain in the right upper abdominal quadrant. Our patient presented with the classical pain in the left hypochondrium.

To reach a diagnosis of situs inversus, radiological investigations such as trans-abdominal Ultrasonography (USG), Computed Tomography (CT) scan and Magnetic Resonance Imaging (MRI) are used.

Situs inversus itself is not a risk factor of gallbladder diseases such as calculous cholecystitis, however, it makes diagnosis and

treatment of abdominal diseases a challenging task [9-11]. A laparoscopic cholecystectomy is a safe option in cholelithiasis patients with situs inversus as shown by Campos and Sipes who performed the first successful laparoscopic cholecystectomy in such a patient in 1991 [12-14]. Before this, open cholecystectomy was the procedure of choice for patients with symptomatic gallstones with or without situs inversus.

Situs inversus is one of the three components that form Kartagener syndrome, the other two being bronchiectasis and chronic sinusitis. Therefore, pre-operative assessment of patients with situs inversus who are scheduled for laparoscopic cholecystectomy is of paramount importance and potentially serious cardiac or respiratory abnormalities must be ruled out [15].

It is critical to identify anatomical structures which are arranged in the opposite direction to avoid intra- and post-operative complications [16]. Majority of surgeons worldwide are right-handed and thus all operative procedures are formulated keeping in view right as the dominant hand. In patients with situs inversus, right-handed surgeons face problems during dissection at Calot's triangle and retraction of the gallbladder, thus making the overall procedure time-consuming [17-19].

Therefore, only an experienced laparoscopic and hepatobiliary surgeon should take on the task of performing laparoscopic cholecystectomy in the case of situs inversus [20]. The most important step in open and laparoscopic cholecystectomy is to achieve a critical view of safety of the Calot's triangle. This becomes difficult in situs inversus due to the eccentric anatomy of the abdominal organs so was the case in the procedure we underwent.

What is interesting is that no data is available regarding conversion to open surgery which might be due to the extra care and precaution rendered by surgeons while performing surgery keeping in view the rarity and complexity of situs inversus totalis.

RESULTS

Laparoscopic cholecystectomy was performed successfully despite of reversed visceral anatomy of the patient. Patient was discharged on the 2nd post-operative day. The patient was called for follow up after 1 week in surgical OPD, which was uneventful.

CONCLUSION

To encounter cholelithiasis with situs inversus is a rare occurring. Situs inversus is associated with left-right positional changes of different bodily organs. Change in positioning and orientation of the surgeon on the operation table makes laparoscopic cholecystectomy (treatment of choice for gallbladder stones) challenging. Nonetheless, laparoscopic cholecystectomy can be used safely and effectively to treat cholelithiasis in the setting of situs inversus. More attention needs to be given towards improving radiological and surgical management of patients with situs inversus.

REFERENCES

1. Djohan RS, Rodriguez HE, Wiesman IM, Unti JA, Podbielski FJ. Laparoscopic cholecystectomy and appendectomy in situs inversus totalis. JSLS. 2000;4(3):251-254.
2. AlKhlaiwy O, AlMuhsin 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.
3. Mayo CW, Rice RG. Situs inversustotalis: a statistical review of data on 76 cases with special reference to disease of the biliary tract. Arch Surg. 1949;58:724-730.
4. Benhammane H, Kharmoum S, Terraz S, Berney T, Nguyen-Tang T, Genevay M, et al. Common bile duct adenocarcinoma in a patient with situs inversus totalis: report of a rare case. BMC. 2012;5(1):681.
5. Goh P, Tekant Y, Shang NS, Ngoi SS. Laparoscopic cholecystectomy in a patient with empyema of the gallbladder and situs inversus. Endoscopy. 1992;24(9):799-800.
6. Channabasappa SM, Mohan HS, Sarma J. A patient with situs inversus totalis presenting for emergency laparoscopic appendectomy: Consideration for safe anesthetic management. Anesth Essays Res. 2013;7(1):127-129.
7. Jang JY, Lee W, Cho J, Jeong CY, Hong SC. Laparoscopic cholecystectomy in two patients with situs inversus totalis: a case report. J Minimally Invasive Surge. 2018;21(2):82-85.
8. Elbeshry TM, Ghnnam WM. Retrograde (fundus first) laparoscopic cholecystectomy in situs inversus totalis. Sultan Qaboos Univ Med J. 2012;12(1):113-115.
9. 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):711-715.
10. McKay D, Blake G. Laparoscopic cholecystectomy in situs inversus totalis: a case report. BMC. 2005;5(1):5.
11. Ren JJ, Li SD, Geng YJ, Xiao R. Modified laparoscopic cholecystectomy technique for treatment of situs inversus totalis: a case report. J Int Med Res. 2017;45(3):1261-1267.
12. Campos L, Sipes E Laparoscopic cholecystectomy in a 39 year old female with situs inversus. J Laparoendoscopic Surg. 1991;1(2): 123-125.
13. Hall TC, Barandiaran J, Perry EP. Laparoscopic cholecystectomy in situs inversus totalis: is it safe? Ann R Coll Surg Eng. 2010;92(5):e30-2.
14. Aydin U, Unalp O, Yazici P, Gurcu B, Sozbilen M, Coker A. Laparoscopic cholecystectomy in a patient with situs inversus totalis. WJG. 2006;12(47):7717-7719.
15. Kumar S, Fusai G. Laparoscopic cholecystectomy in situs inversus totalis with left-sided gall bladder. Ann R Coll Surg Eng. 2007;89(2):W16- W18.
16. Mohammed AA, Arif SH. Laparoscopic cholecystectomy for left-sided gall bladder in situs inversus totalis patient, a technically demanding procedure. Ann Med Surg (Lond). 2019;47:1-4.
17. Pavlidis TE, Psarras K, Triantafyllou A, Marakis GN, Sakantamis AK. Laparoscopic cholecystectomy for severe acute cholecystitis in a patient with situs inversustotalis and posterior cystic artery. Diagn Ther Endosc. 2008;2008:465272.
18. Fang JF, Zheng ZH, Wei B, Chen TF, Lei PR, Huang JL, et al. Laparoscopic resection for rectal cancer and cholecystectomy for patient with situs inversus totalis. J Minim Access Surg. 2015;11(3):210-212.
19. Ahmed Z, Khan SA, Chhabra S, Yadav R, Kumar N, Vij V, 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.

20. Kamitani S, Tsutamoto Y, Hanasawa K, Tani T. Laparoscopic cholecystectomy in situs inversus totalis with "inferior" cystic artery: a case report. WJG. 2005;11(33):5232-5234.