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LAPAROSCOPIC CHOLECYSTECTOMY IN SITUS INVERSUS TOTALIS: A CASE REPORT AND REVIEW OF THE SURGICAL TECHNIQUES

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ABSTRACT

Background: Situs inversus totalis is a rare condition characterized by the mirror image transposition of internal organs. Diagnosis may be difficult when the patient has situs inversus as the presenting symptoms may lead to confusion. Laparoscopic cholecystectomy becomes more technically demanding for surgeons due to the modification and reorientation of the surgical procedure.

Case study: A 46-year-old male patient presented with left upper quadrant pain, nausea, and vomiting. Physical examination revealed mild tenderness to palpation in the left upper quadrant region. Murphy's sign was negative and the laboratory results were normal. Abdominal ultrasonography revealed situs inversus and a single 36-mm gallstone. The patient underwent laparoscopic cholecystectomy and the postoperative course was uneventful.

Conclusion: Due to the reversal of internal organs in patients with situs inversus totalis, laparoscopic cholecystectomy becomes technically demanding in patients who present with cholelithiasis. Various techniques have been suggested to minimize reorientation issues during surgery.

Keywords: Situs inversus, cholelithiasis, laparoscopic cholecystectomy

INTRODUCTION

Situs inversus totalis is a rare congenital abnormality characterized by the mirror image transposition of both abdominal and thoracic organs. It has been reported that the incidence of situs inversus totalis varies between 1:5,000 and 1:20,000 and is more common in males [1–3]. Situs inversus alone is not a risk factor for cholelithiasis. Since the signs and symptoms in patients who have not been diagnosed with situs inversus arise from an abnormally located gallbladder, it is a matter of confusion and leads to a delay in diagnosis.

The first laparoscopic cholecystectomy in a patient with situs inversus was performed by Campos and Sipes in 1991 [4]. Since then, more than 60 cases of laparoscopic cholecystectomy in situs inversus patients have been reported [4]. Laparoscopic cholecystectomy remains the gold standard for symptomatic cholelithiasis even in the presence of situs inversus [5].

The presence of situs inversus poses some technical difficulties during the laparoscopic approach. There are uncertainties in port placement due to the normal anatomy being reversed. Since some important dissections must be performed using the left hand during the operation, it may pose a technical difficulty for right–handed surgeons [4]. In this case report, we present a 46-year-old male patient who presented with left upper quadrant pain and underwent laparoscopic cholecystectomy for symptomatic gallstone disease.

CASE REPORT

A 46-year-old male patient presented to the outpatient clinic with left upper quadrant pain for two weeks in duration. The patient also noted nausea and vomiting. Medical history was unremarkable with no chronic medication use. Physical examination revealed mild tenderness to palpation in the left upper quadrant region. Murphy's sign was negative and the laboratory results were normal. Abdominal ultrasonography revealed situs inversus and a single 36-mm gallstone. The preoperative chest X-ray revealed dextrocardia (Figure 1). The patient underwent laparoscopic cholecystectomy and the postoperative course was uneventful (Figures 2–4). The patient was discharged the following day and did not develop any complications.

Written informed consent was obtained from the patient.

DISCUSSION

Diagnosing a patient with gallstone disease can be difficult if situs inversus is not previously known. These patients typically present with left upper quadrant pain, which was the case in our patient. Although rare, right upper quadrant pain may occur in 10% of cases [4]. Other symptoms include nausea, vomiting, and discomfort in the epigastric region. Hepatobiliary ultrasonography and hepatobiliary iminodiacetic acid (HIDA) scintigraphy are useful in making the diagnosis.

Various techniques have been used for laparoscopic cholecystectomy in patients with situs inversus. The most commonly used surgical technique is to apply the

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mirror image of the normally applied technique. This method was also used in our case. In this technique, the right hand is used to retract the infundibulum and the left hand is used to dissect the gallbladder. Some surgeons ask their assistants to retract the infundibulum because they find it difficult to use the non-dominant hand in critical dissection, which allows the surgeon to dissect using their right hand [4–5].

Some surgeons prefer to 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 or lithotomy position [4]. In one case report, a surgeon developed the three-port technique, which included the epigastric port, supraumbilical port, and left mid-clavicular port. The surgeon would retract the gallbladder with the right hand and perform the dissection with his left hand [6]. In another case, laparoscopic cholecystectomy was performed with a single incision using traditional instruments. A curvilinear infraumblical incision of approximately 2.5 cm in size was performed. Two 10-mm trocars were inserted. The trocar located on the right side of the patient was used for the laparoscope while the one on the left side for cautery or suturing. The gallbladder was suspended on the anterior abdominal wall with the help of two sutures. The first of these was inserted into the anterior axillary line through the 10th intercostal space on the left side, and the seromuscular layer of the gallbladder fundus was punctured and retracted towards the anterior abdominal wall. The Hartmann's pouch was punctured and retracted using the second suture which was inserted in the epigastrium and taken out through the left hypochondrium to expose the Calot's triangle. In this way, the surgery could be performed through a single incision [7].

Single-port laparoscopic cholecystectomy has also been favored in approaching patients with situs inversus. To reduce morbidity and improve the cosmesis of laparoscopic surgery, this technique has recently emerged and resulted in better cosmesis, less post-operative pain, and a better "scarless" surgery. Various surgeons also tried the Alexis wound retractor and a glove as the single access port [8,9].

CONCLUSİON

Patients with situs inversus who have cholelithiasis usually present with left upper quadrant pain and may have vague symptoms. Laparoscopic cholecystectomy still remains the gold standard in treating these patients. Since the anatomical structures are reversed, this may pose a challenge and confusion during surgery. To reduce this, various surgical techniques have been developed and surgeries that result in minimal scar tissue, such as single-port cholecystectomy, have been favored.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

The patient gave his informed consent prior to his inclusion in case report.

FIGURES

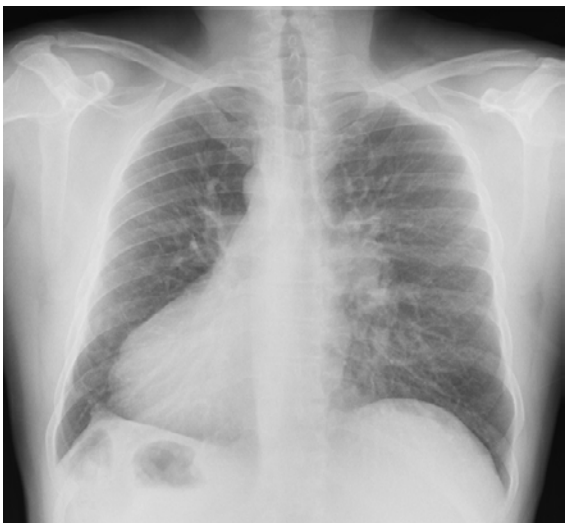

Figure 1. Dextrocardia is observed in the chest X-ray of the patient

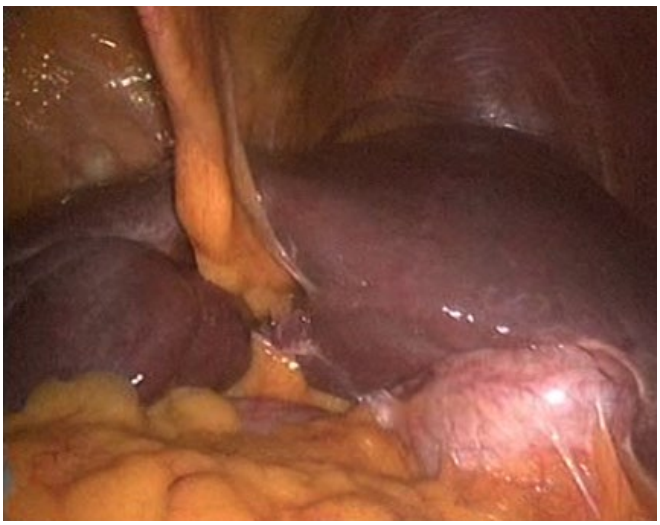

Figure 2. The reversed liver and gallbladder appearance in the patient

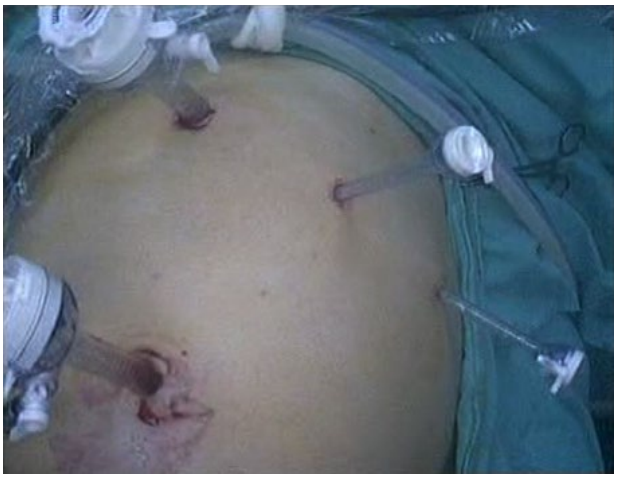

Figure 3. The reversed port placement in laparoscopic cholecystectomy

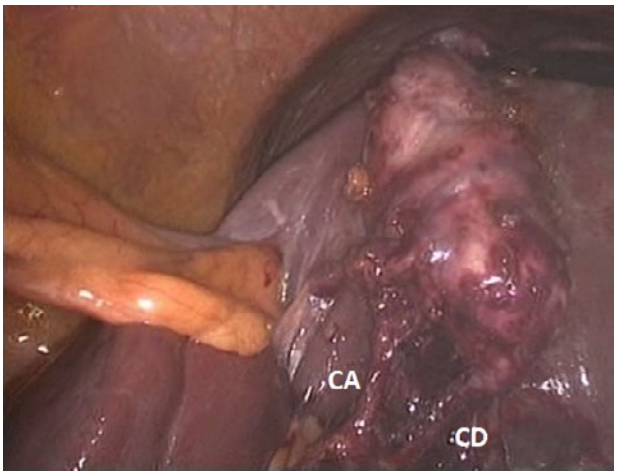

Figure 4. Cystic artery (CA) and cystic duct (CD) appearance in the patient.