

**Case Report**



## Laparoscopic Cholecystectomy in a Patient with Situs Inversus Totalis

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**ABSTRACT**

Laparoscopic cholecystectomy has become the standard approach since its introduction in 1987 by Mouret. Situs inversus totalis is a rare anomaly in which transposition of the organs to the opposite side of the body occurs. Laparoscopic cholecystectomy due to gallbladder diseases in such few cases has been reported in the literature. We aimed to present a new case with symptomatic cholelithiasis, situs inversus totalis, and with a past-medical history of multiple abdominal operations. Special attention has also been paid to the modification of the laparoscopic cholecystectomy procedure.

**Key words:** Cholecystectomy, laparoscopic, situs inversus

**ÖZET**

**Situs İnverson Totalisi Bulunan Bir Hastada Laparoskopik Kolesistektomi**

Laparoskopik kolesistektomi, 1987 yılında Mouret'in bu ameliyatı tanıtmışının ardından standart bir yaklaşım olmuştur. Situs inversus totalis, organların vücudun karşı tarafına yer değiştirdiği ender bir anomalidir. Bu tür ender hastalarda safra kesesi hastalıkları nedeni ile yapılan laparoskopik kolesistektomi olguları literatürde bildirilmiştir. Semptomatik kolelityazis nedeni ile başvuran, situs inversus totalis tanısı olan ve daha önce çoğul karın ameliyatları geçirmiş bir hastayı sunmayı amaçladık. Laparoskopik kolesistektomi ameliyatında yapılan teknik değişikliklere özellikle dikkat çektik.

**Anahtar Sözcükler:** Kolesistektomi, laparoskopik, situs inversus

**S**itus inversus totalis (SIT) is a very rare autosomal recessive entity (1) in which mirror-image transposition of the organs to the opposite side of the body occurs. It might involve only the abdominal or thoracic organs or both (2). SIT was first described by Fabricius in 1600 (3) and its incidence is approximately 1:5000 to 1:20000 new births (2). SIT can be associated with Kartegener's syndrome. SIT normally does not cause any organ dysfunction (4). Few patients with SIT have been previously reported in the literature.

Change in anatomical position of the organs influences the location of symptoms and signs arising from the diseased organ and imposes difficulties in the diagnosis and the surgical treatment of the medical condition (5). Likewise, although the symptoms of cholelithiasis may be clear (4), symptomatic gallstones in patients with situs inversus is a challenge for surgeons.

In the literature, there have been only 40 reports of open cholecystectomy and 20 reports of laparoscopic cholecystectomy in patients with situs inversus (6). We hereby aimed to present a new SIT patient with previous multiple operations to whom laparoscopic cholecystectomy was performed due to symptomatic cholelithiasis.

**CASE REPORT**

A 47-year-old female patient was admitted to our clinic with a history of colicky epigastric pain and dyspepsia of two-month duration. Her past-medical history revealed SIT as an incidental finding and previous three abdominal operations in different centers. She had hysterectomy due to myoma uteri 6 years ago. One year after this operation, she developed recurrent suprapubic pain. So, she underwent explorative laparotomy and then she was referred to a university hospital where re-laparotomy was performed. Right oophorectomy due to a suspicious cystic mass in the right ovary, segmental jejunal resection and end-to-end bowel anastomosis due to ischemia of the small bowel and prophylactic appendectomy were performed. Pathologic examination of the cyst showed hemorrhagic endometrioid cyst and of the intestine revealed chronic inflammation and diffuse fibrosis due to adhesions. On physical examination, cardiac apex beat was found in the right hemithorax. Epigastric and right upper quadrant tenderness was noted on abdominal examination. Laboratory data showed neither any abnormality of liver function tests nor white blood cell count. Dextrocardia was detected on plane chest X-ray (Figure 1). Abdominal computed tomography scan confirmed SIT (Figure 2) but not gallstones. However, multiple millimetric stones were detected on ultrasonography.

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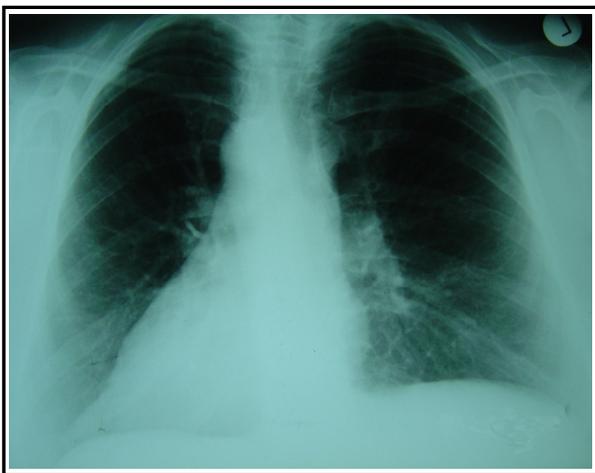
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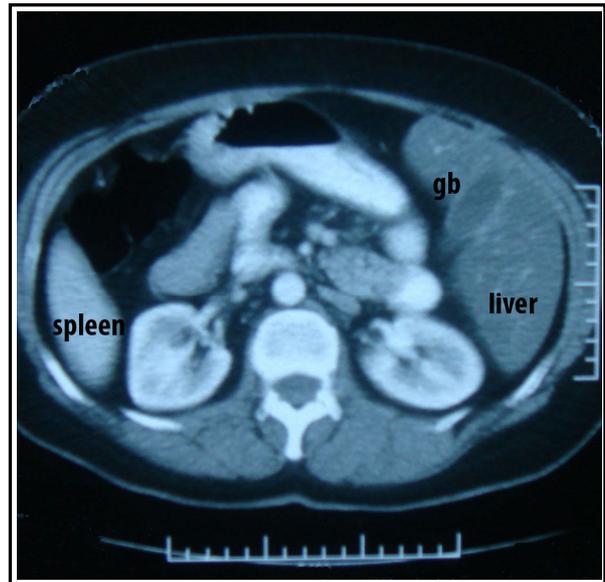
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She was not found to have Kartegener's syndrome during her previous medical evaluation.

The patient underwent laparoscopic cholecystectomy (LC) under general anesthesia. The operating room and surgical team were set up as a mirror-image configuration of normal LC. We preferred French position. Open technique (Hasson's technique) was preferred as the patient had previous abdominal operations. This incision was made at the right lateral side of the umbilicus. Pneumoperitoneum with CO<sub>2</sub> was established with a pressure of 12 mmHg. A 30-degree viewing laparoscope was introduced via a 10-mm umbilical port. Visualization of the intraabdominal organs confirmed SIT. However, fibrinous adhesions between the small intestine and the left upper anterior abdominal wall were noted. Second 5 mm port was inserted in the left anterior axillary line and via this port adhesiolysis procedure was completed with a grasper and scissors. The other two ports were placed in this order; one 10-mm port in the midline in the sub-xiphoidal region and one 5-mm port (working port of the surgeon) in the left midclavicular line at the left paraumbilical level. The port sides are shown in Figure 3. On laparoscopic examination, intrahepatic localization of the gall bladder was detected. It was fibrotic and adherent to the omentum due to the previous attacks of cholecystitis. As the hilus of the gallbladder could not be visualized clearly due to fibrosis, retrograde cholecystectomy procedure was performed. The fundus of the gallbladder was grasped and retracted with a clinch through the 5-mm port in the left anterior axillary line. Traction of the Hartmann's pouch was carried out by the surgeon's left hand using a grasper inserted through the 10-mm port in the sub-xiphoidal region. Dissection of the Calot's triangle was performed with electrocautery. Next, the cystic duct and artery were identified and clipped in a usual fashion. The gallbladder was dissected from the liver bed and removed through the umbilical port. A drain was placed in the subhepatic region. The remaining part of the operation concluded uneventfully. The operative time was 100 minutes. The patient was discharged on the postoperative day 1. Pathologic examination of the specimen revealed chronic cholecystitis with cholelithiasis. No complication has emerged during a 1 year follow-up period.



**Figure 1.** Plane chest X-ray demonstrates dextrocardia with an elevated left hemidiaphragm indicating the liver on the left side.



**Figure 2.** Preoperative abdominal computed tomography of the patient. Total situs inversus can easily be identified (gb: gall bladder).



**Figure 3.** Trocar sides of the patient are shown. Arrows indicate the midline incision scar due to the previous abdominal operations.

## DISCUSSION

Cholecystitis in patients with SIT is a rare clinical condition. In a report by Sato et al., 1802 patients underwent laparoscopic procedures consecutively, and the incidence of situs inversus was found to be 0.2% (7). Sporadic reports of LC in visceral situs inversus have appeared in the literature since 1992 (8). The reports of SIT cases have been increasing as more surgeons perform more LC procedures.

SIT does not increase the incidence of gallbladder disease. However, physical examination of a patient with situs inversus can be misleading and cause clinical confusion. The presentation with left upper quadrant pain may delay the

diagnosis of gallstones. Although most patients present with pain on the left side due to the peritoneal irritation, ten percent of patients with cholelithiasis on the left side present with right-sided abdominal pain. Thirty percent of such patients have epigastric pain (9). Because the central nervous system may not share the general transposition, pain can be felt in such different places (10). So, in patients with situs inversus to whom LC is planned, complete assessment of the patient is mandatory in order to avoid potential complications (6).

In a literature review by Machado et al, 32 patients with SIT have been operated on laparoscopically due to gallbladder disease. Among them, 6 patients had acute cholecystitis, 3 had biliary colics, 1 had empyema, 3 had cholangitis, and 19 had chronic cholecystitis. Previous abdominal operation had been performed in only one patient (11). In our case, the patient past-medical history also revealed previous multiple abdominal operations. So far, including our patient, a total number of only 2 SIT cases who had had previous abdominal operations have undergone LC. In another report, laparo-

scopic appendectomy was also carried out in addition to cholecystectomy (12).

We performed fundohilar dissection of the gallbladder. Although, in this case, retrograde dissection was necessitated due to inadequate visualization of the hilus of the gallbladder in intrahepatic localization, some reports advocate antegrade dissection as it provides better visualization of the anatomical structures (13, 14).

In summary, the value of laparoscopy in evaluation of patients with atypical abdominal pain has been well established and LC is the treatment of choice for symptomatic cholelithiasis. Laparoscopic approach should be the same for patients with SIT and this is supported by previous reports in the literature. This procedure in patients with SIT is, however, more difficult than usual due to the mirror-image anatomy especially for a right-handed surgeon. With modifications in the surgical team and equipment, the operation can be performed safely by a surgeon experienced in laparoscopy.

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