### **Case Report**

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# Inverting the laparoscopic cholecystectomy: a case of acute biliary pancreatitis in situs inversus

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#### **ABSTRACT**

A 57-year-old female presented in Outpatient Department with complaints of left upper abdominal pain for last 5 days. She had left hypochondrial and epigastric tenderness with apex beat palpable in right 5<sup>th</sup> intercostal space. Diagnostic work-up revealed acute biliary pancreatitis with situs inversus totalis. Abdominal sonogram showed left sided distended gallbladder with multiple stones. Laparoscopic cholecystectomy was done after initial stabilization of the patient. Patient's recovery was uneventful in the postoperative period.

**Keywords:** Contrast enhanced computed tomography, Gallstones, Laparoscopic cholecystectomy, Pancreatitis, Situs inversus totalis, Transabdominal ultrasound

#### INTRODUCTION

Situs inversus is characterized by the transposition of the viscera that may be thoracic, abdominal or both. It is an autosomal recessive disorder. It is prevalent in 0.04% to 0.30% of cases worldwide. There are two types of this malformation: situs inversus partialis is defined by either transposition of thoracic organs mainly heart (dextrocardia) or abdominal viscera, whereas situs inversus totalis involves transposition of both thoracic organs and abdominal viscera.

Situs inversus is associated with neurological, cardiorespiratory, gastrointestinal, hepatopancreaticobiliary, orthopedic or urological anomalies that may pose a significant threat to life.<sup>2</sup> It is essential for all surgeons to be fully aware of these anatomical changes, so that they can effectively diagnose and surgically treat those patients who present with gallbladder disease.<sup>3,7</sup> We encountered a female patient with symptomatic gallstone disease and situs inversus

totalis and successfully performed our first laparoscopic cholecystectomy.

#### **CASE REPORT**

A 57-year-old married lady, with no known co-morbids and addiction, presented in Emergency Department of our institution in May 2016 with complaints of pain in left upper abdomen radiating to back for last 5 days. The patient denied any history of vomiting, fever, epigastric discomfort and retrosternal burning. Review of systems was unremarkable. Family history for malignancies was insignificant. On physical examination, her vital signs were normal.

Abdomen was tender in left hypochondrium and epigastrium. There was no palpable visceromegaly. Lymph nodes were not palpable elsewhere in her body. On chest examination, apex beat was found on right side in 5<sup>th</sup> intercostal space. Digital rectal examination and examination of central nervous, respiratory and musculoskeletal system was unremarkable.

Her laboratory results showed normal hemogram and raised serum amylase and lipase values. Transabdominal ultrasound (USG) showed abdominal situs inversus and left sided distended gall bladder with multiple gallstones. Contrast enhanced Computed Tomography (CECT) of abdomen showed situs inversus and acute pancreatitis with a CT severity index of 4. Patient was diagnosed as case of acute biliary pancreatitis. Radiograph chest showed dextrocardia as well.



Figure 1: Radiograph chest (PA view) showing cardiac shadow on right side.



Figure 2: CT scan abdomen showing liver on left side and spleen on right.

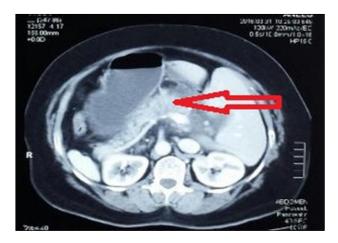


Figure 3: CT scan abdomen showing swollen pancreas (red arrow).

Patient was initially managed conservatively and after optimization, she was scheduled for laparoscopic exploration. Laparoscopic cholecystectomy was done in the elective operation theatre with some modifications. The surgeon performed the procedure from the right side of the patient with the cameraman standing on the same side and assistant surgeon was positioned on left side. The patient was positioned in the supine position on the operating table with the head end elevated and tilted to the right side. Standard four (4) port technique was adopted.

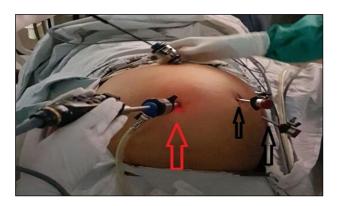


Figure 4: Laparoscopic ports for Situs inversus umbilical port red arrow and left hypochondrial ports black arrows.

After creating pneumopertioneum through a veress needle, a 10-mm umbilical port through the umbilicus; a 10-mm medial epigastric port below the xiphoid process with the tip directed to the left of falciform ligament, and two 5 mm lateral subcostal ports (one in left midclavicular line and the other in left anterior axillary line) were inserted. On initial visual inspection, liver and gall bladder were identified on the left side. The stomach (greater curvature directed towards right) and spleen were present on right side and the caecum in left hemiabdomen, thereby confirming situs inversus totalis. A grasper was passed through the 5-mm left anterior axillary line port for holding the fundus of the gall bladder and pushing it in the cephalic direction. The instruments passed through the epigastric port were controlled by the surgeon's left hand, initially for retracting the Hartmann's pouch and later, for inserting the clip applicator and clipping cystic duct and cystic artery.

The right hand of the surgeon was used to control the instruments passed through the left medial subcostal port. Maryland dissector was used to dissect the calot's triangle and identify the cystic duct and artery, scissors to cut the cystic duct and artery after clipping, and harmonic device for separation of GB from liver bed. All these instruments were introduced through the left medial subcostal port. Using a grasper, the gall bladder was removed through the epigastric port. A drain was placed in left subhepatic space and wounds closed. The patient was extubated and shifted to post anesthesia care unit

(PACU). She was allowed oral diet six hours after the procedure. Drain was removed on 1<sup>st</sup> post-operative day and she was discharged from the hospital in stable condition.

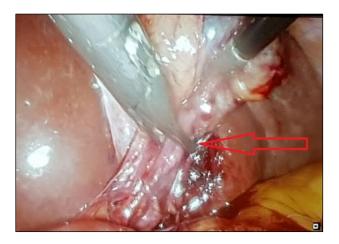


Figure 5: Application of metallic clips on cystic duct (red arrow).

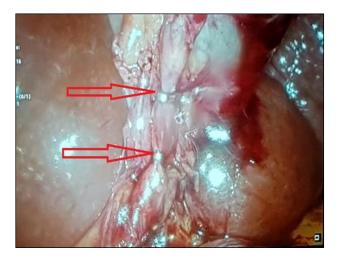


Figure 6: Cystic duct clipped at two sites.



Figure 7: Cystic duct cut between clips (red arrow).

#### **DISCUSSION**

Situs inversus totalis is defined by transposition of all body organs to the opposite side. This tern was first described by Fabricus in 1600. In literature, its incidence is 1:5000-1:20,000.<sup>5</sup> Most of these patients are asymptomatic and diagnosing cholelithiasis in such patients is a challenging task. These patients usually present with pain in left upper quadrant of the abdomen; however, epigastric pain is reported to be present in 30-40% of patients.<sup>6</sup> Approximately, 10% patients present with right hypochondrial pain. Our patient presented with left hypochondrial pain which is the classical presentation in patients with situs inversus.

Transabdominal ultrasonography (USG), contrast enhanced computerized tomography (CECT) and magnetic resonance imaging (MRI) aids in the diagnosis of situs inversus.<sup>7.8</sup> This was seen in our patient as well and later confirmed during laparoscopic procedure.

Since the discovery of situs inversus totalis, open cholecystectomy was the procedure of choice in patients with symptomatic gallstones.<sup>5</sup> In 1991, Campos and his colleague succeeded in performing the first ever laparoscopic cholecystectomy in patients with situs inversus with a gallbladder pathology. In literature, 40 patients of open cholecystectomy in the pre-laparoscopy times and 79 patients of laparoscopic cholecystectomy in situs inversus totalis have been recorded. 10 Any respiratory or cardiac abnormality must be properly evaluated and addressed prior to laparoscopic cholecystectomy.

To deal with this eccentric anatomy of gall bladder, it is important to devise a different preoperative plan. This includes the readjustment in the positioning of surgical team and placement of laparoscopic trocars in left hemiabdomen. The standard four port technique was used in our case as recommended and reported in other studies as well.<sup>3,4,6,9</sup>

In order to optimize the surgical procedure, a "mirror image" to routine laparoscopic cholecystectomy was adopted. Surgeon stood on the right side of the patient, and all operative equipment and ports were placed on left side of the patient. The most vital step in this operation is to attain a critical view of safety for calot's triangle.<sup>11</sup> In our case, the dissection of the cholecystic pedicle in left sided gall bladder was difficult and troublesome, but not time-consuming. The operating surgeon was right handed and he rearranged the epigastric and left subcostal port for dissecting the calot's triangle and cholecystic pedicle and later clips application. Lochman et al and Arya et al also adopted this technique for performing laparoscopic cholecystectomy in situs inversus patients.<sup>6,12</sup>

In order to improve the operative ergodynamics, an alternative technique can be adopted. The patient is placed in the lithotomy position with the surgeon

standing in between the patient legs and calot's triangle been dissected through right subcostal port. Patle et al performed five cholecystectomies using this technique. <sup>13</sup> Raghuveer et al also used the same method while performing a cholecystectomy in a 55-year-old male. <sup>14</sup>

While performing a laparoscopic cholecystectomy in situs inversus patients, Lochman et al and Moirangthem et al took almost 70 minutes and 75 minutes to complete the procedure respectively. The operative time in our case was 30 minutes which was significantly less than that reported in literature. 4.6,12,13,15

Thus, our patient presented with symptomatic gallstones exhibiting situs inversus totalis and was operated through laparoscopic cholecystectomy successfully.

#### **CONCLUSION**

Laparoscopic cholecystectomy in patients with situs inversus is a challenging surgery. Therefore, it should be performed by an expert surgeon with full pre- and intra operative workup.

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