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Laparoscopic hemicolectomy for a patient with situs inversus totalis: A case report

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ABSTRACT

INTRODUCTION: Situs inversus totalis (SIT) is a rare congenital anomaly in which the left and right aspects of the thoracic and intra-abdominal organs are inverted, like a mirror image. Surgical procedures in a patients with SIT is difficult as their anatomy is abnormal. In particular, laparoscopic procedures are considered more difficult in patients with SIT because of the mirror-image anatomy.
PRESENTATION OF CASE: The patient was a 75-year-old woman with ascending colon cancer. Laparoscopic hemicolectomy with radical lymphadenectomy was performed. After surgery, no specific complications developed. On the ninth postoperative day, the patient was discharged from our hospital. Recognition of the inverted anatomy by the surgeon using preoperative imaging permitted safe operation using techniques not otherwise differing from those used in ordinary cases.
DISCUSSION AND CONCLUSIONS: Laparoscopic colectomy is considered to be a safe and feasible option for patients with colorectal cancer and SIT.

1. Introduction

Situs inversus totalis (SIT) is a rare congenital anomaly with an incidence rate of 1 per 5000–10,000 adults [1]. In cases of SIT, the left and right aspects of the thoracic and intra-abdominal organs are inverted, like a mirror image [2]. Due to the different anatomical positions of the organs, surgical procedures in patients with SIT are considered more difficult than those in others, particularly laparoscopic surgery. While, laparoscopic colorectal surgery (LCS) is currently the standard procedure for colorectal cancers (CRC), including the present case, only eight cases of LCS for colorectal cancer in patients with SIT have been reported [3–9].

We herein report the case of a 75-year-old patient with ascending colon cancer and SIT who underwent laparoscopic hemicolectomy with radical lymphadenectomy. The technical differences between this case and cases with normal anatomy are described.

The work in this case has been reported in line with the SCARE criteria [10].

2. Presentation of case

A 75-year-old woman, known since early childhood to have SIT, was admitted to our hospital with a diagnosis of ascending colon cancer, according to colonoscopy, for further evaluation and surgical treatment. The patient had no medical history of abdominal surgery, and results from the general physical examination were normal. Laboratory examination confirmed no anemia or hepatic, renal, or electrolyte dysfunction. Serum carcinoembryonic antigen level and CA 19-9 level were not elevated.

Chest radiography showed dextrocardia (Fig. 1A). Abdominal computed tomography (CT) revealed complete transposition of abdominal viscera, confirming SIT. CT and CT colonography showed a mass in the ascending colon and no evidence of distant metastasis (Figs. 1 B and 2 A). CT angiography showed that the superior mesenteric artery was located on the left side (Fig. 2B). An ulcerated lesion in the ascending colon was observed by colonoscopy (Fig. 3). Biopsies from this lesion revealed moderately differentiated adenocarcinoma. Based on the above findings, laparoscopic hemicolectomy with radical lymphadenectomy was planned.

While under general anesthesia, the patient was placed in the lithotomy position with her head and right side down. The operating surgeon was situated on the right side of the patient (opposite to the usual for surgery), with the first assistant on the left, and the endoscopist on the right (Fig. 4). A camera was inserted into the abdomen through a 12-mm trocar at the umbilicus. Four additional trocars were placed. For the operating surgeon, a 12-mm trocar was

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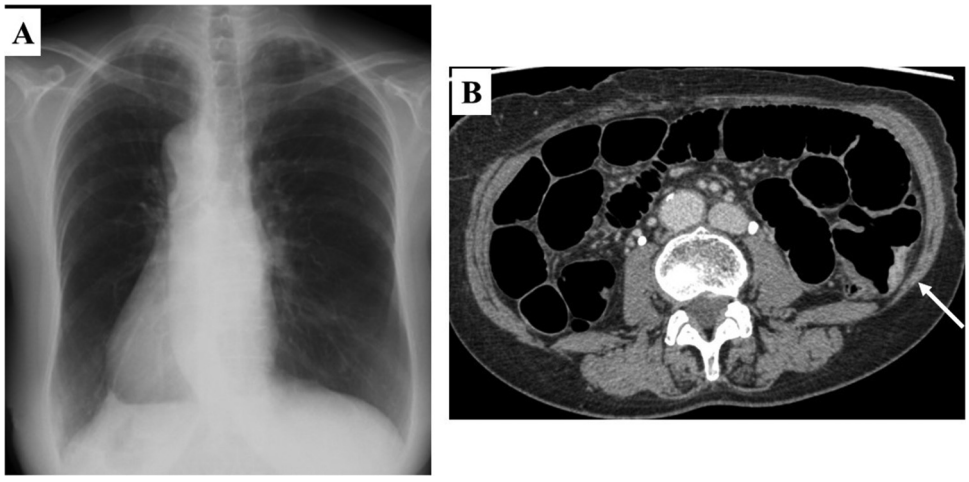

Fig. 1. Chest radiography and abdominal computed tomography of the patient. (A) Chest radiography showing dextrocardia. (B) Abdominal computed tomography (CT) shows a mass in the ascending colon (arrow).

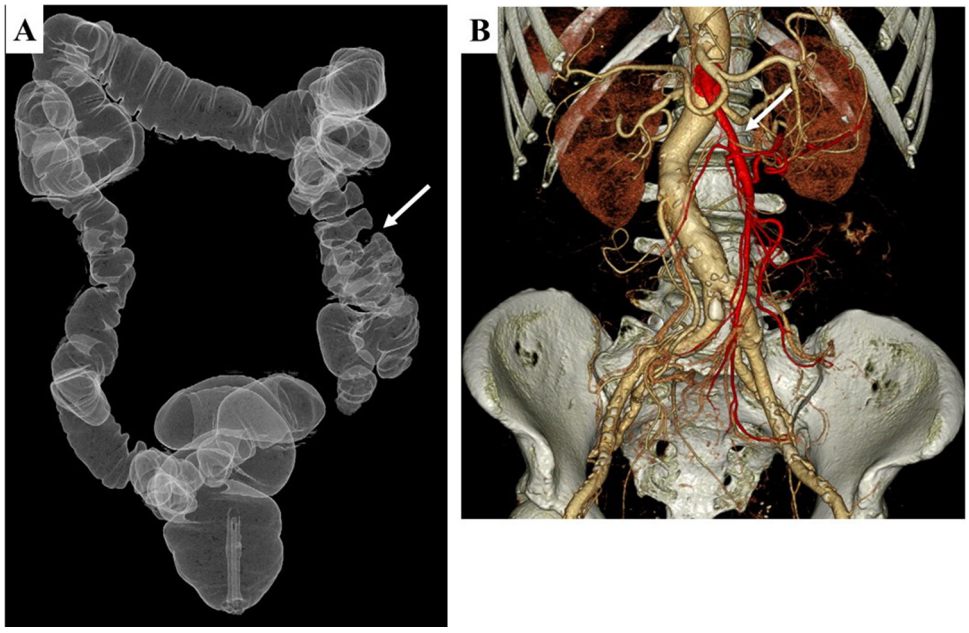

Fig. 2. CT angiography and CT colonography. (A) Three-dimensional CT angiography shows the superior mesenteric artery, located on the right side (arrow). (B) CT-colonography shows a mass in the ascending colon.

placed in the right lower quadrant and a 5-mm trocar was placed in the right flank, and for the assistant, a 12-mm trocar was placed in the left lower quadrant and a 5-mm trocar was placed in the left flank (Fig. 4).

Upon commencement of the laparoscopy, the liver, the cecum and ascending colon were situated at the left, and the spleen on the right. The tumor was located in the ascending colon (Fig. 5A, B). First, the left-sided colon was mobilized using a medial approach. The mesentery was incised caudal to the ileocolic vessels, and the fusion fascia was mobilized, searching the anterior surface of the transverse portion of the duodenum. The ileocolic vessels were identified and divided after the superior mesenteric vein was exposed (Fig. 5C, D). Following mobilization of the ascending colon, dissection and reconstruction of the colon was performed using end-to-side anastomosis extracorporeally through a 2.5 cm skin incision continued to the umbilical port site. Operating time was 109 min and blood loss was 10 mL, similar to typical findings in orthotropic patients. Pathological findings showed a moderately differentiated adenocarcinoma measuring 1.4 × 1.2 cm, with invasion of the submucosa. In addition, 17 regional lymph nodes including one positive node were resected. The patient was discharged on the ninth postoperative day without any complications.

3. Discussion

SIT is a rare congenital condition in which the structures of the abdominal and thoracic cavities are completely inverted. Cardiac and intestinal malformations, as well as other visceral and vascular anomalies associated with SIT, follow a variable pattern. Apart from genetic predisposition, no other etiology has been established, and SIT itself has no pathophysiologic significance. Congenital anomalies, such as syndromes of splenic anomalies (asplenia and polysplenia) and biliary atresia, have been reported to be common in patients with SIT [11]. With the radiologic modalities, diagnosis of SIT and concurrent anomalies has become relatively easy. How-