CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 45 (2018) 56–62

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Laparoscopic Roux-en-Y gastric bypass in a patient with situs inversus totalis: Case report, technical tips and review of the literature☆

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ARTICLE INFO

Article history:
Received 2 December 2017
Received in revised form 28 January 2018
Accepted 5 March 2018
Available online 15 March 2018

Keywords:
Situs inversus totalis
SIT
Laparoscopic Roux-en Y gastric bypass
LRYGB
Bariatric surgery
Obesity
Case report

ABSTRACT

INTRODUCTION: Laparoscopic Roux-en-Y gastric bypass (LRYGB) has proven over the years to be one of the most effective bariatric procedures. It is highly technical, and therefore is mostly performed by bariatric and metabolic surgeons. Although Situs Inversus Totalis (SIT) is a very rare congenital condition, surgeons do occasionally have to operate intra-abdominally on those patients, consequently facing some challenges related to the unusual anatomy.

CASE PRESENTATION: We describe a rare case of LRYGB for chronic morbid obesity on a 43 year old patient with pre-operative diagnosis of situs inversus totalis without Kartagener's syndrome, using slight modification from the usual technique based on anatomical correlation without the need to change the surgeon's position or switching trocar placements as described in previous papers. This could help surgeons in general reduce the potential challenges faced when performing such procedure.

CONCLUSION: Situs Inversus Totalis is a rare congenital condition, but surgeons in general do encounter those patients throughout their career. This rare condition should not solely be an indication for an open approach as minimally invasive surgery, whether laparoscopic or robotic, is safe and should still be considered the standard of care approach. Bariatric surgery is one of the most technical intra-abdominal procedures mainly due to the patients' body habitus, different instrumentations used, and the different anastomoses created. Gastric bypass and bariatric surgery in general can be safely performed on patients with SIT without the need for major adjustment to the surgeon's position, trocar placement or instruments used.

1. Introduction

Situs inversus totalis (SIT) is a rare autosomal recessive condition that is found in about 0.005%–0.02% of the population. It involves complete transposition of intra-abdominal organs (mirror image formation) with the heart located in the right chest cavity (dextrocardia). The majority of SIT patients have no symptoms or complications because the relationship between the organs is not changed. Laparoscopic Roux-en-y gastric bypass (LRYGB) for morbid obesity is one of the most effective bariatric procedures done in the United States and is currently considered the gold standard in bariatric surgery. We report a rare case of LRYGB that was done successfully on a patient with SIT without major changes in the usual operative technique or length of procedure.

2. Case presentation

Our patient is a 43 year old female with known pre-operative diagnosis of situs inversus without Kartagener's syndrome that was demonstrated on a prior CT of the abdomen and pelvis (Fig. 1). Her dextrocardia was discovered in the past on a chest x-ray (CXR) obtained during a work up for atrial fibrillation (Fig. 2). Pre-operative BMI was 50 kg/m^2 and comorbidities included hypertension, Insulin dependent diabetes mellitus, obstructive sleep apnea, dyslipidemia, severe gastro-esophageal reflux disease (GERD) on daily proton pump inhibitor (PPI) therapy and atrial fibrillation on daily Clopidogrel. Patient failed throughout the years to achieve or maintain any significant weight loss despite multiple dietary and exercise attempts. After proper pre-operative workup she was found to be a good candidate for LRYGB. Surgery was performed successfully without significant changes in the usual surgeon and trocar positions or in the operative time and technique.

In standard setup for LRYGB with normal anatomy we usually place the patient in supine position with arms abducted and the operating surgeon performing the entire procedure standing on the right side of the patient using the dominant right hand when utilizing energy, stapling and free hand suturing.

☆ This work has been reported in line with the SCARE criteria [22].

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https://doi.org/10.1016/j.ijscr.2018.03.004

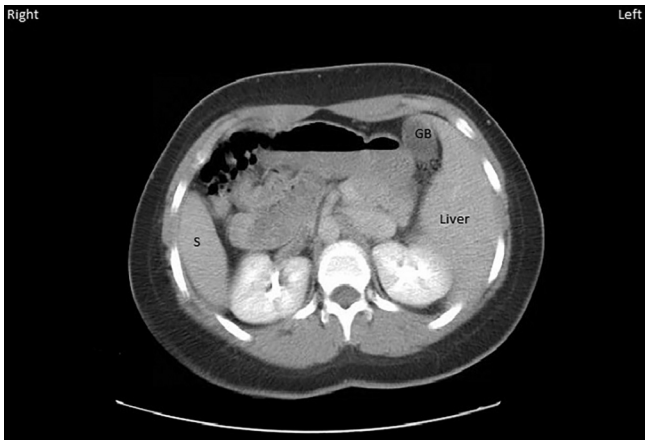

Fig. 1. CT scan of the abdomen in our situs inversus totalis (SIT) patient showing the spleen (S) located on the right side, the liver and gallbladder (GB) on the left side.

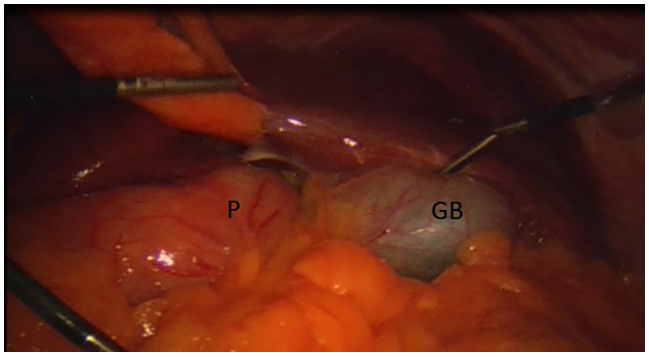

Fig. 3. The gallbladder (GB) is located in the left upper quadrant, and the pylorus (P) in the midline at the level of the falciform ligament.

Having in mind that performing this procedure on SIT patients standing entirely on the left side of the patient, using the non-dominant left hand for most of the technical aspects of the procedure, can be very confusing and challenging we opted to maintain our standard setting and continue to operate from the right side of the patient for the most part of the procedure to minimize any confusion and maintain efficiency. The total number and location of trocars used in our case were similar to that in standard cases with normal anatomy, except that we had to make one of the left sided trocars a 12 mm instead of 5 mm so we can use the stapling device from the left side when creating the gastric pouch. A supra-umbilical (Optiview) trocar was used for entry to the abdominal cavity. Two trocars were placed in the left upper quadrant and left mid-abdomen, and two other trocars in the right upper quadrant and right mid-abdomen. We also used the Nathanson liver

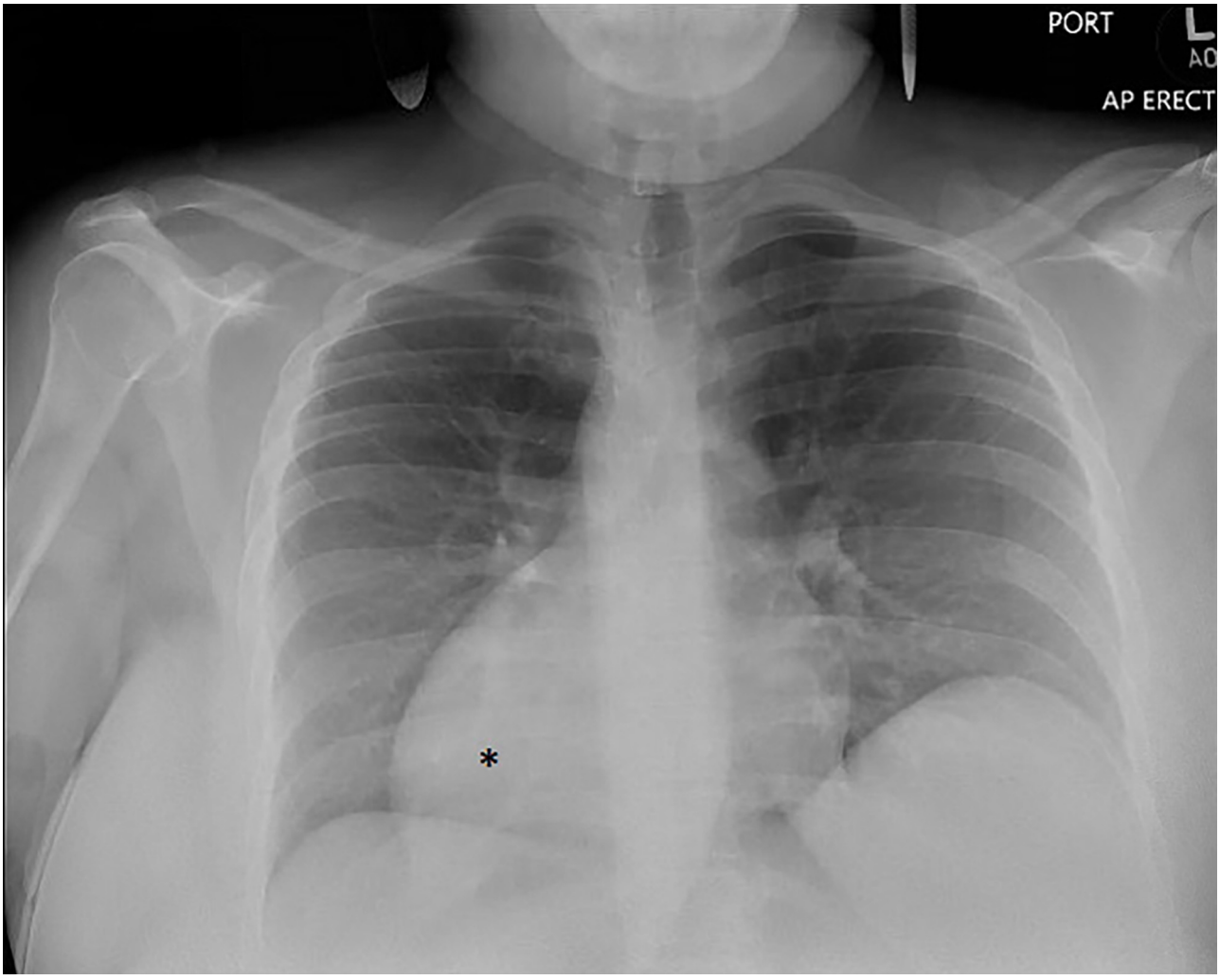

Fig. 2. CXR in our SIT patient demonstrating dextrocardia *.