Laparoscopic biliopancreatic diversion for a morbidly obese patient with situs inversus totalis: Case report

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A B S T R A C T

INTRODUCTION: Situs inversus is a rare congenital anomaly in which the thoracic and abdominal organs are sited on the opposite side to that of normal anatomy. Its etiology is still unknown. It is classified into situs inversus partialis and situs inversus totalis. It is discovered incidentally in most cases. Any surgical intervention for such patients may encounter intra-operative technical difficulties due to anatomical differences, particularly if a laparoscopic approach is adopted, as in bariatric surgeries where the obesity itself opposes an added surgical challenge.

CASE PRESENTATION: A female patient with a BMI of 52.1 Kg/m² was being prepared for biliopancreatic diversion. She was diagnosed incidentally as having situs inversus totalis during the preoperative evaluation. She underwent an uneventful laparoscopic biliopancreatic diversion. She was followed up regularly in the bariatric surgery clinic for 9 years. Her last BMI was 29 Kg/m² with no signs or symptoms of metabolic complications.

CONCLUSION: This case report demonstrates that biliopancreatic diversion can be done safely in morbidly obese patients with situs inversus by an experienced bariatric surgeon in a specialized well-equipped center.

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1. Introduction

Situs inversus totalis (SIT) was first described by Fabricius in the 17th century. It is a rare autosomal recessive congenital anomaly with mirror image transposition of thoracic and abdominal organs. Its etiology remains uncertain. Meanwhile, some authors claim that it is due to a fetal insult during intra-uterine life. Its incidence is estimated to be 0.01 % of the general population. The male to female ratio is 1:1. Usually, SIT is discovered incidentally during examination or investigations done for unrelated condition. Surgical interventions in patients with SIT are associated with technical difficulties and laparoscopic bariatric procedures in particular present added surgical challenges in such patients [1,2].

We report a case of morbid obesity with SIT who underwent successful laparoscopic biliopancreatic diversion (BDP), cholecystectomy and appendectomy. This work is reported in line with SCARE criteria [3].

2. Case presentation

A 39-year-old woman presented to the bariatric surgery clinic due to morbid obesity of more than five years in duration. Her BMI was 52.1 Kg/m². Apart from chronic low back pain, she did not have any other comorbidities and had no previous surgeries. Routine laboratory tests were normal. Chest X-ray showed dextrocardia. Chest and abdominal computerized tomography (CT) scan showed a mirror image transposition of all internal organs confirming the diagnosis of SIT (Fig. 1). An Anesthesia consultant evaluated her and requested pulmonology and cardiology consultation preoperatively. Fortunately, she was cleared and accepted for the operation.

Laparoscopic biliopancreatic diversion under general anesthesia was planned. She was placed in a supine, reversed Trendelenberg position. Modifications of the standard technique were made. The surgeon and the first assistant stood on the right side, while the second assistant stood on the left side of the patient. Pneumoperitoneum was achieved using a Veress needle placed in reversed Palmer’s point: right midclavicular line, two centimeters below the costal margin. A 30° scope was inserted, via an 11-mm visi-port trocar, two centimeters above and to the right of the umbilicus. Diagnostic laparoscopy confirmed the diagnosis of SIT. Trocars were inserted under direct vision in a mirror image fashion (Fig. 2). The

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first working 12-mm trocar was placed three centimeters below the costal margin at the anterior axillary line. The second was placed six centimeters below costal margin at the left mid-clavicular line. Another 5-mm trocar was inserted two centimeters below xiphisternum.

Starting with cholecystectomy, there was no major difference except for some initial disorientation. Calot triangle was carefully dissected, no associated anomalies were found. Then, the anatomy of stomach was reviewed meticulously. Creation of gastric pouch was performed by transection of stomach at a landmark of ten centimeters along the lesser curvature and 15 cm along the greater curvature from the oesophagus. A gastrotomy was made. The small bowel was run from the ligament of Treitz to the ileocecal junction. Appendectomy was also performed. The common limb was measured 50 cm from ileocecal junction with creation of an enterotomy and marking with a stitch. Another enterotomy was made 200 cm proximally to create the alimentary limb. The gastro-enteric anastomosis was completed using stapler. The biliopancreatic limb was transected and connected to the common limb via a side-to-side entero-enteric stapled anastomosis. The whole procedure took 200 min.

On the first post-operative day, a water-soluble follow through demonstrated the patency of the anastomosis and excluded anastomotic leakage. Then, the patient was allowed to start drinking clear liquids and escalated to full diet following the dietitian’s instructions. She was discharged on the second post-operative day. She was followed up regularly in the bariatric surgery clinic. She was compliant to vitamin and mineral supplements. Nine years later, she was found to have no back pain and no metabolic complications and her BMI was 29.1 kg/m².

3. Discussion

There are many articles discussing performing different bariatric procedures in morbidly obese patients with SIT, mainly laparoscopic sleeve gastrectomy, laparoscopic gastric bypass and laparoscopic adjustable gastric band. However, to the best of our knowledge, this is the first article to discuss performing laparoscopic biliopancreatic diversion in morbidly obese patient with SIT.

The incidence of obesity among Saudi citizens is increasing. It was estimated to be less than 20% in 1990s. However, it reaches now up to 30% [4,5]. Bariatric surgery has the advantage of long term efficacy in sustaining loss of weight [4].

Usually, people with SIT have normal organ function. However, it can be associated with multiple congenital diseases, such as con-
genital heart disease, bronchiectasis, polypsplenia, biliary atresia and vascular anomalies of the celiac trunk and the presence of a double cystic artery may lead to unexpected hemorrhage and present additional surgical challenge. Therefore, these patients must be thoroughly investigated preoperatively to confirm the diagnosis, to exclude any other similar conditions and to detect any other associated congenital anomalies [6]. In this case, preoperative pulmonary function tests and echocardiography showed no abnormalities. In addition, abdominal ultrasonography showed a normal biliary system. CT scan confirmed the SIT and excluded associated abdominal pathologies.

In general, laparoscopic bariatric procedures are technically demanding. The presence of SIT increases the challenge and introduces technical difficulties as a result of reversed anatomy and the possibility of associated anomalies. Technical difficulties are a major challenge for the surgeon as additional time is needed to cope with the mirror image anatomy in order to prevent iatrogenic injury, thus leading to a longer than usual surgery time [6]. Surgeons’ standing positions in addition to trocar insertion sites should be carefully planned preoperatively. The altered anatomy in patients with SIT requires trocars, liver retractors and staplers to be inserted in a reverse position [1]. Some surgeons reported using a mirror image technique in different laparoscopic procedures, while others reversed the use of their hands making the surgeon more prone to fatigue as the dissecting hand must move across the patient’s whole body.

We preferred using the mirror image technique for the surgeon’s position and trocars’ insertion sites. Our average duration for laparoscopic biliopancreatic diversion is 120 min. In this case, the procedure took 200 min to be completed safely and successfully.

4. Conclusion

Biliopancreatic diversion can be performed safely and effectively if careful preoperative assessment is undertaken. The orientation of the surgeon and the assistants should be planned according to the surgeon’s preference. However, using the mirror image approach would help to prevent early surgeon fatigue.

Conflict of interests

No conflict of interests.

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Ethical approval

Case reports are exempted from ethical approval according to policies of Imam Abdulrahman Bin Faisal University.

Consent

Witten informed consent was obtained from the patient for publication of this case report.

Author contribution

Dr. Mohamed Khalid Mirza Gari: main author, study design, reviewing article.
Dr. Mohammed S. Foula: writing the paper, reviewing article.
Dr. Abdullah ALQatan: data collection, writing the paper.
Dr. Hassan Albusaleh: data collection.
Dr. Tasnim Hussain AlAli: data collection.

Registration of research studies

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi: https://doi.org/10.1016/j.ijscr.2018.05.005.

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