

# Sleeve gastrectomy in situs inversus totalis case

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## ABSTRACT

Laparoscopic sleeve gastrectomy surgery is a procedure that has become more common in the past 10 years. Situs inversus totalis is an extremely rare condition. SG can be performed safely in SIT patients. However, pre-operative multidisciplinary evaluation is very important. In this article, we present a 25-year-old female patient with a body mass index of 47.6 who had no idea that she had SIT until pre-operative tests revealed it. The patient was discharged on the 3<sup>rd</sup> post-operative day without any problem. We would like to emphasize the importance of imaging even if the patient does not have any disease or risk before bariatric surgery. We believe that more studies should be done with SIT and bariatric surgery.

*Keywords: Bariatric surgery; obesity; situs inversus totalis; situs inversus; sleeve gastrectomy.*

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SI is an extremely rare congenital condition. Situs inversus totalis is seen with a frequency of 2–10 out of 100,000 [1]. In this case, the visceral organs are located in the symmetry of their normal anatomical position. It is possible for all or only one organ to be displaced. Although the exact cause is unknown, mutations play a role in the background of this condition. When surgical treatment is required for any reason in patients with SI, reverse anatomy can cause technical difficulties [2].

The history of SI is very old, dextrocardia has been described in Egyptian mummies [3]. This anomaly was first described in animals by Aristotle (BC. 384–322). Fabricius described it in humans in 1600, followed by Marco Severino in 1643, Riolan in 1652, and Matthew Baillie of the Hunterian School of Medicine and his students in 1788. Kuchenmeister was the first to realize the condition in a living person in 1888. In 1897, Vehse-meyer was recognized as the first person to demonstrate X-ray transposition of internal organs [4, 5].

Laparoscopic sleeve gastrectomy (LSG) is the most commonly used method in the surgical treatment of morbid obesity today. SI seen in patients scheduled for LSG can also complicate this surgery and sometimes lead to an increase in complication rates [6].

In this article, it was aimed to present the pre-operative and intraoperative processes of a patient with SI who underwent LSG.

## CASE REPORT

A 25-year-old female patient, 152 cm, 110 kg, the calculated body mass index was 47.6 kg/m<sup>2</sup>. She has no chronic diseases. The patient, who tried various diets, lifestyle changes, and sports for an average of 4 years, could not get any results from these efforts. She has no previous surgery, no history of smoking, or alcohol use. As a result of the multidisciplinary evaluation, sleeve gastrectomy was planned for the patient who was found suitable



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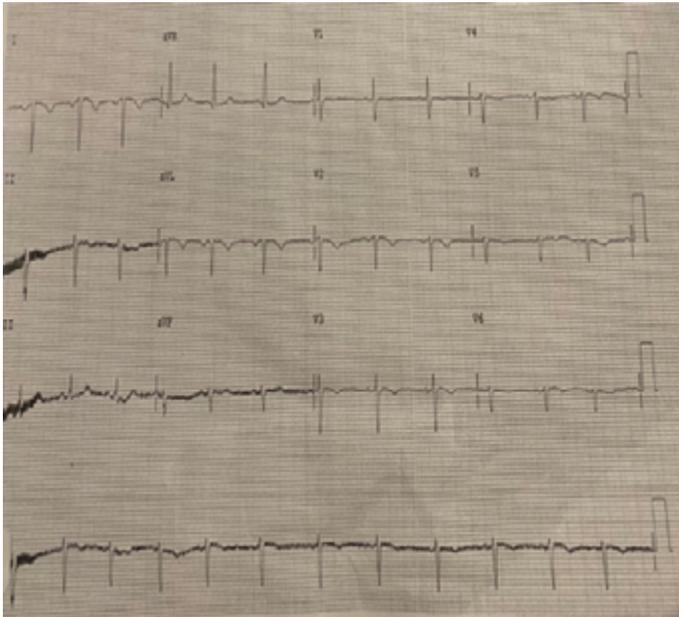
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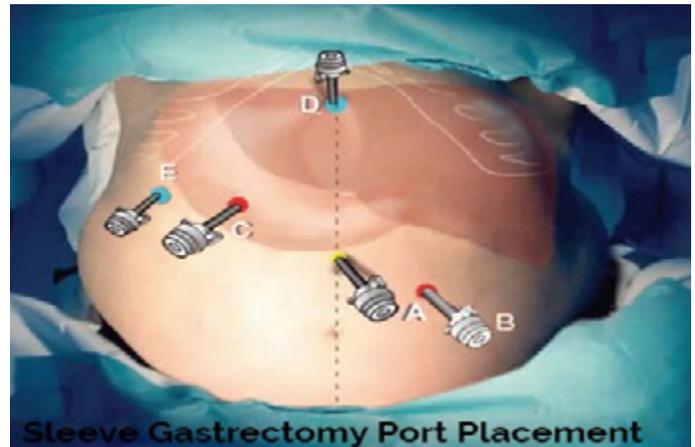
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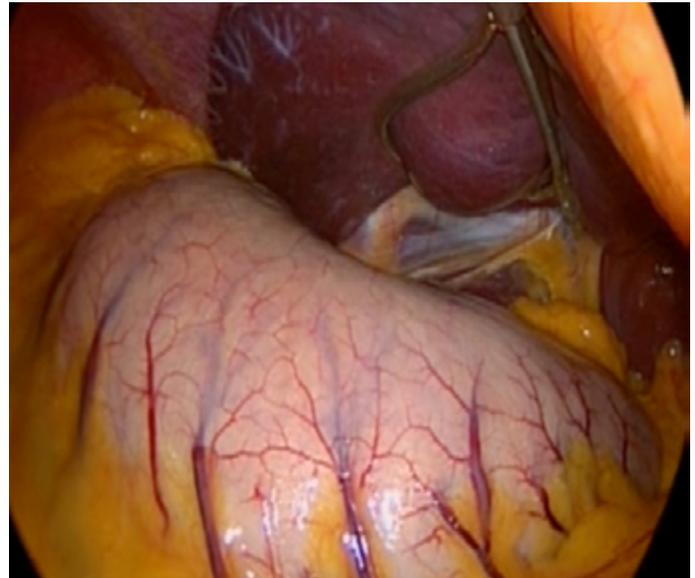
**FIGURE 1.** Preoperative electrocardiogram of the patient.

for obesity surgery. Situs inversus totalis was detected in thoracoabdominal CT taken preoperatively. Electrocardiography revealed P negativity and T negativity with signs of the right axis deviation and dextrocardia (Fig. 1).

Our routine pre-operative endoscopic examination was performed without any problem, with the left decubitus position, which is our usual position, by seeing its mirror image. Following the intratracheal intubation under general anesthesia, the patient was positioned on the operating table in the reverse Trendelenburg and French position (split-leg supine). The left-handed surgeon was located between the patient's legs, and the assistant was to the right of the patient. First, a 10-mm camera port was placed approximately 8 cm below the xiphoid with the direct entry method. Intra-abdominal pressure was adjusted to 15 mm Hg by insufflation of CO<sub>2</sub>. After intra-abdominal exploration, other trocars were inserted, as shown in figure (Fig. 2). Dissection of the greater curvature from the omentum was started with a blunt type LigaSure 5 mm–37 cm (Fig. 3). The stomach was released from the surrounding tissues by dissection until the right diaphragmatic crus was seen instead of the left diaphragmatic crus seen in normal sleeve gastrectomy. The 36F size bougie was placed intra-gastrically, and the resection was completed, starting at a distance of 4 cm from the pylorus, with the GIA Tri-Staples first 1 black, then 4 purple. No bleeding was observed. The operation time was noted as 27 min. Diet was started with water on the post-operative 1<sup>st</sup>



**FIGURE 2.** The port placements for laparoscopic sleeve gastrectomy.



**FIGURE 3.** The image of the stomach placed in the upper right side of abdominal cavity.

day. Following the CRP control on the post-operative 2<sup>nd</sup> day, the liquid diet was begun by adjusting it to be predominantly protein. On the post-operative day 3, the drain was removed and she was discharged.

## DISCUSSION

Obesity is one of the most problematic diseases of today, together with its accompanying diseases. The long-term effects of diet, drug, and endoscopic solutions seem to be limited. Surgery is the most effective treatment in the appropriate indication [7]. For this reason, the number of surgeries is increasing every year and LSG has become

the most performed surgery [8]. In addition to being easier to achieve plateau performance in the learning curve compared to other surgeries, low mortality and morbidity are among its advantages. Although there are complications such as leakage, bleeding, infection, and embolism, mortality is very rarely observed thanks to solutions such as stent or transfusion [9].

Situs inversus is a rare genetic condition inherited from OR. In this disease, the organs are located in the opposite direction, like a mirror image. Although its genetic background is not fully known, it has been shown that it may be autosomal recessive and may be accompanied by an X chromosome defect. There are two types available: Situs inversus totalis and situs inversus partialis. While there is anatomical change in one or more organs in SIP, all abdominal and thoracic organs are displaced in SIT [4]. If there is no accompanying pathology, it may remain undiagnosed for years. Patients can hear this situation for the 1st time when it is revealed in pre-operative tests. However, patients who are aware of this condition may perceive it as unimportant and not tell you.

Surgery preparation should be done meticulously in SIT patients. Especially cardiology should be warned against possible congenital heart anomalies. However, it should be informed against possible syndromes such as Kartagener's Syndrome that may accompany anesthesia. Increased secretion and prolonged intubation are likely in these patients. There are published cases of prolonged intubation [10]. Since the heart is on the right side, it will be possible to monitor the patient correctly after placing the pads in their appropriate places [11]. Although pre-operative endoscopy is recommended to be performed in the right decubitus position, it can also be performed in the left decubitus position [12]. Port placement will be very important in surgery. Since the surgeon may have some difficulty due to its mirror image, proper placement of the ports is much more important. It is recommended that the 10 camera port be entered as a standard first, and the other ports should be entered in accordance with its mirror image (Fig. 2). Optic with 30° should be used [13]. However, since laparoscopic repair may be more difficult against possible intraoperative injuries, open surgery preparation should also be made in order not to waste time and not be stressed. Spleen injury should be considered in cases of situs ambiguous or polysplenia. Since it is a very rare condition, it is important to reach a more experienced surgeon when needed [14].

In the review study of Aziret et al. [14], 21 patients with SIT and CP were examined between 1998 and April 2016. Of these patients, five had LSG, one had LSG+ duodenojejunal bypass, ten had LRYGB, and five had LAGB surgery. In this study, one leak was detected after LSG, and no other complication was observed. Operation times have been reported between 78 min and 400 min. In our case, the operation time was 27 min.

If SIT was not detected preoperatively, the operative position and placement of the surgeons should be reconstructed. In addition, although there are publications on the fact that robotic surgery can help in coping with mirror image, there is a shortage of data on this subject [15]. In addition, left-handed surgeons are thought to be advantageous over right-handed surgeons in patients with SIT [7].

The limited association of SG frequency in these patients limits our knowledge. More work is needed on this subject.

## Conclusion

SG can be applied safely in SI patients. Close coordination is required with other parts of the bariatric team, such as anesthesiologists and cardiologists. The case should be prepared together. If necessary, help from more experienced surgeons should be sought after the decision for surgery has been made. Since pre-operative determination of SI status plays a key role in all these measures, radiological examinations performed before bariatric surgery is very important. More studies are needed since the coexistence of SG and SI is very rare.

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