

Online case report

# Are laparoscopic bariatric procedures feasible in morbidly obese patients with situs inversus? A report of 2 cases and a brief review

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Laparoscopic bariatric surgeries are technically demanding procedures in the high-risk population. Any deviation from normal anatomy in those patients poses therefore a special challenge. A typical example for deranged anatomic landmarks is situs inversus totalis (SIT), which is a rare congenital abnormality (1:5,000–1:20,000 new births) with mirror image transposition of the abdominal and thoracic organs [1]. The presence of SIT in morbidly obese patients undergoing bariatric surgical interventions necessitates meticulous perioperative practice. Herein, we present our experience in 2 morbidly obese patients with SIT, who underwent laparoscopic sleeve gastrectomy (LSG) and laparoscopic Roux-en-Y gastric bypass (LRYGB) in our clinic. Additionally, we reviewed the literature for similar reports.

## Methods

An online PubMed search was performed using key words “situs inversus”, “obesity”, and “bariatric surgery”. Nine case reports were detected (Table 1) [2–10]. One additional case report was written in Portuguese and was excluded [11]. In addition, we report 2 cases operated by 2 surgeons in our center of excellence for obesity surgery. Both patients conformed to the National Institutes of Health (NIH) criteria for obesity surgery [12]. Patient 1 underwent LSG and was operated by surgeon 1. Patient 2 underwent LRYGB and was operated by surgeon 2.

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## Case Reports

### Case 1

A 51-year-old female patient sought bariatric surgical intervention for her morbid obesity (body mass index [BMI] = 54.2 kg/m<sup>2</sup>) in our clinic. Her additional co-morbidities included diabetes mellitus and hypertension. Preoperative assessment included abdominal ultrasonography, plain chest x-ray, gastroscopy and electrocardiography (ECG). Her SIT was incidentally diagnosed through abdominal ultrasonography (USG) and plain chest x-ray. A decision for LSG was made. After preoperative preparation, the operation was done in reverse Trendelenburg position, with the surgeon standing in French position and the assistant standing exceptionally to the right of the patient. The monitor was placed at the patient’s head. Five 12-mm trocars were used. The 1st trocar (for insufflation and a 30° optic device) was inserted a hand breadth below the xiphoid process, just to the right of the midline. The 2nd trocar (for liver retractor) was inserted inside the left midclavicular line, just proximal to the level of the first trocar. The 3rd trocar was inserted inside the right midclavicular line, opposite the second trocar. The 4th and 5th trocars were inserted through both rectus sheathes just cranial to the level of the 2nd and 3rd trocars. After diagnostic laparoscopy, the operative steps started by gastric greater curvature devascularization starting 5 cm to the right of the gastroduodenal junction. After insertion of a 42Fr orogastric bougie, gastric sleeve construction was done using serial application of 60-mm long green and blue endo GIA staple loads. Reinforcement of the staple line was done using Peri-Strips Dry with

Table 1  
A brief review for English-language studies reporting surgical bariatric intervention for morbidly obese patients with situs inversus totalis. Data related to our 2 reported cases are also demonstrated.

	Gender	Age (yr)	Kartagener syndrome (°)	Previous interventions	Body Mass Index (BMI) before operation (Kg/m <sup>2</sup> )	Investigations	Intervention	Other interventions	Position of surgeon	Duration of operation (min)	Hospital stay (d)	Complications	Follow-up
Wittgrove et al. [2]	F	38	No	No	47.8	x-ray chest/ECG	LRYGB	No	To the right of the patient	300 (average 159)	2	No	At 5 mo postoperatively: <ul style="list-style-type: none"> <li>● % EWL = 55%</li> <li>● Resolution of reflux, asthma, and incontinence</li> <li>● Improvement of arthritis and hyperlipidemia</li> </ul>
Ersoy et al. [3]	F	33	NA	No	53	x-ray chest/gastroscopy/ECG/USG	LAGB	No	French position	NA	3	No	BMI = 36 kg/m <sup>2</sup> after 18 mo
Ahmed et al. [4]	F	47	No	No	58.1	ECG/abdominal CT	LRYGB	No	To the left side of the patient	160 (average 105)	2	No	BMI = 49 kg/m <sup>2</sup> after 2 mo
Catheline et al. [5]	M	19	No	No	76	ECG/gastroscopy/x-ray chest/USG	LSG	No	French position	NA	7	No	% EWL after 9 mo = 39%
Pauli et al. [6]	F	47	Yes	No	60	x-ray chest/chest and abdominal CT	LAGB	No	To the left side of the patient	105	NA	no	<ul style="list-style-type: none"> <li>● 11.3 kg weight loss after 3 mo</li> <li>● Improvement of chest condition</li> </ul>
Samaan et al. [7]	M	29	No	No	56	ECG	LAGB	No	French position	NA	1	Band erosion after 3 mo	40 kg weight loss after 4 mo
Matar et al. [8]	M	28	NA	No	51	x-ray chest/barium swallow/ECG/USG	LAGB	No	NA	NA	NA	No	NA
Taskin et al. [9]	F	20	No	BIB	44.9	USG/x-ray chest	LAGB	LC	French position	NA	2	No	NA
Deutsch et al. [10]	M	39	No	Open gastric banding 20 months before LSG	42	Abdominal CT	LSG	No	NA	NA	NA	Leak-age and endo-scopic stenting	% EWL after 2 yr = 60%
<b>Our study:</b>													
● Patient 1 (operated by surgeon 1)		51	No	No	54.2	USG/x-ray chest/gastroscopy/ECG	LSG	No	French position	61	5 <sup>[†]</sup>	No	2 yr after surgery: <ul style="list-style-type: none"> <li>● Drop of HbA<sub>1c</sub> from 6.3 gm/dL to 5.5 gm/dL</li> </ul>

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