

# Mesenteric vein thrombosis after laparoscopic sleeve gastrectomy. A case report

Omar Felipe Gaytán Fuentes M.D.

Antonio Torres Trejo M.D.

Israel Abraham Gaytán Fuentes M.D.

Javier González Chavira M.D.

Mexico City, Mexico

Case Report

Plastic Surgery



## Background:

Mesenteric thrombosis is rare entity, but it has a high morbimortality in patients being submitted to a weight loss surgery.

**Case Report:** A 40-year-old patient being submitted, three weeks before, to sleeve gastrectomy, with a history of morbid obesity, obstructive sleep apnea, pulmonary arterial hypertension, among others. The peculiar symptom was the abdominal pain of a 6-hour duration. Mesenteric vein thrombosis was classified as secondary, and a bowel resection of the affected segment was necessary but there was immediate bowel restitution. The patient develops acute renal failure which leads to substitutive therapy of the renal function with Prism machine. The patient evolves without any complication. The patient loses 50% of weight after 2 months of surgery.

**Discussion:** Mesenteric vein thrombosis is a rare entity with vague symptomatology. The patient history, diagnostic suspicion and image studies are the most important factors which lead to diagnosis, which is difficult to diagnose before surgery. Surgery with resection of the affected segment means acceptable results.

**Conclusions:** The high suspicion index, the diagnosis and the early treatment in a patient with mesenteric thrombosis submitted to a weight loss procedure improve the life expectancy of a patient with these features. However, more studies, for this kind of population with this disease, are required.

**Keywords:** sleeve gastrectomy, mesenteric vein thrombosis.

**M**esenteric vein thrombosis (MVT) is an entity of low frequency but great importance because it results in ischemia or infarction of the small bowel or colon<sup>1</sup>. It is defined as a total or partial circulatory impairment about the bowel requirements, which can cause segmental or total necrosis<sup>2</sup>. Such disease corresponds to a sub diagnosed entity because it can be recognized when it starts catastrophically as a bowel infarction<sup>3</sup>. It represents 1% of the patients with acute abdomen and the mortality percentage is between 60 and 100%<sup>4</sup>. MVT represents

5%-15% of all the mesenteric ischemic events<sup>5, 6</sup> which is why the early diagnosis achieves to improve the prognosis, but the mortality is about 70%.<sup>7</sup> A 5-year survival of 18-50% is reported.<sup>8, 9.</sup>

Among the associated factors, there are prothrombotic states, hematologic diseases, inflammatory diseases such as obesity, postoperative state, cirrhosis and trauma, among others.<sup>2, 4, 10.</sup>

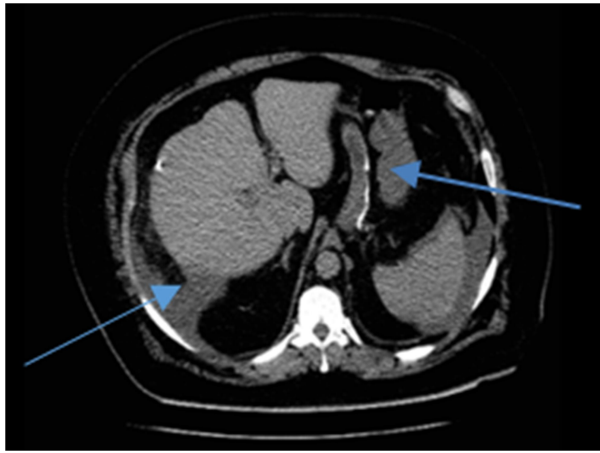
Obesity is considered a hypercoagulability state with a higher risk than the average of thromboembolic events due to the chronic inflammatory state related to obesity, increase of the

abdominal pressure, vein stasis of the lower extremities and a sedentary lifestyle<sup>11, 12, 13.</sup>

Laparoscopic procedures to morbid obesity are becoming the gold standard of attention because they have low mortality and morbidity<sup>14</sup>, although a percentage of up to 40% of patients with complications is reported<sup>15</sup>. Laparoscopic gastric sleeve is a relatively new procedure in the treatment of morbid obesity, its complications are well known, including leaks on the staples line, hemorrhage, stenosis, among others.<sup>14</sup> Superior MTV has been reported in literature after different laparoscopic bariatric and no bariatric procedures.<sup>14</sup> Mesenteric vein thrombosis (MVT) has been informed after laparoscopic procedures, including splenectomy,<sup>16, 17, 18</sup> appendectomy, fundoplication, cholecystectomy and bariatric surgery<sup>19, 20, 21, 22, 23.</sup>

The objective of this information is to show the clinical features and the evolution of a patient with mesenteric vein thrombosis presented after three weeks of laparoscopic sleeve gastrectomy (LSG) for the treatment of morbid obesity

From the Upper Gastrointestinal Robotic Surgery Fellowship. General Surgery Department at November 20th National Medical Center. ISSSTE. México City, México. Received on October 8, 2024. Accepted on October 22, 2024. Published on October 23, 2024.



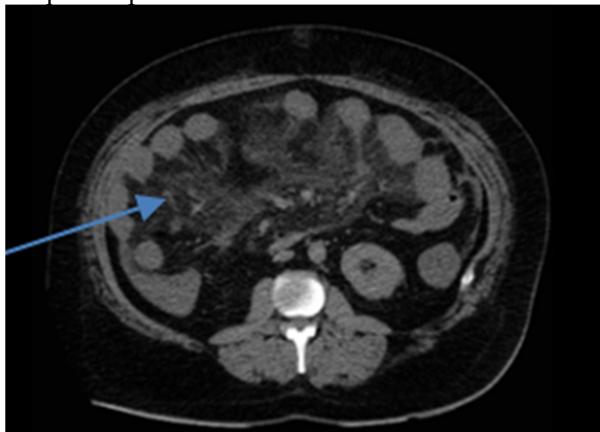
**Figure 1.** Axial plane with perisplenic and perihepatic fluid.

**Case report**

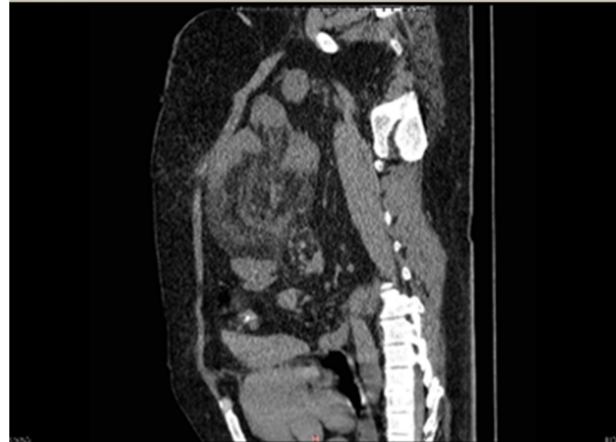
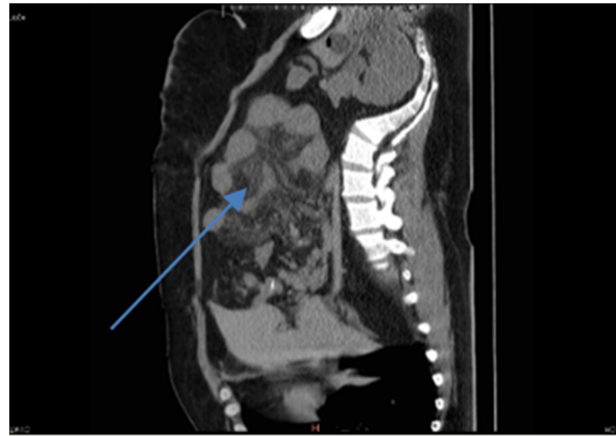
A 41-year-old man with this important history: systemic arterial hypertension of 15 years of evolution, chronic partial thrombosis on distal third of the right femoral vein, 5 years before sleeve gastrectomy, which required anticoagulation during 6 months; congestive heart failure, obstructive apnea syndrome with use of BiPAP system; 76 mmHg severe pulmonary arterial hypertension on treatment with sildenafil, concentric ventricular left hypertrophy (LVEF 60%) right ventricular and auricular dilatation, sinus tachycardia; left bundle branch block and morbid obesity BMI 52 kg/m<sup>2</sup>

The disease is started 21 days after laparoscopic sleeve gastrectomy (LSG) for weight loss. The patient is admitted to the urgency department with generalized abdominal pain of high intensity of a 6 hours duration, low abundant digestive hemorrhage (hematochezia), asthenia and adynamic. At the moment of the physical exploration, the patient presents mixed shock data (hypovolemic and septic) with metabolic acidosis, electrolyte imbalance, leukocytosis, neutrophilia and acute renal failure).

CT scan of simple abdomen is required due to the patient presents increase of serum creatinine which



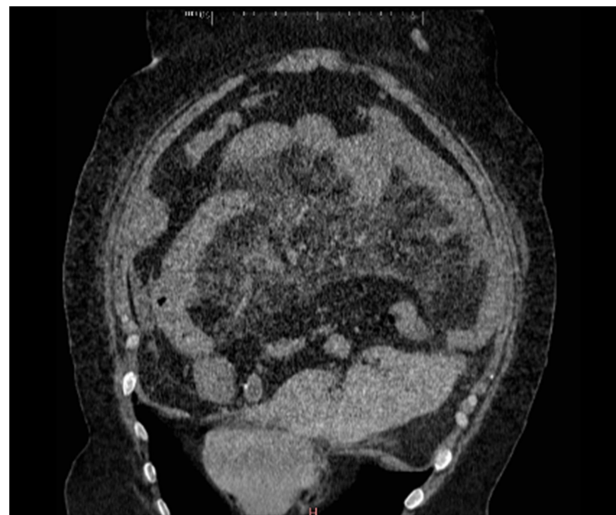
**Figure 2.** On the level of the ileum-jejunum transition with partial increase of the reduction of the mesenteric fat.



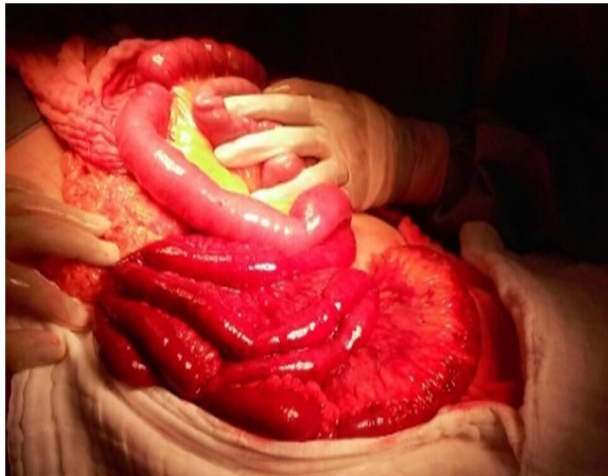
**Figure 3 (upper) and 4 (lower).** Sagittal plane with reduction of the mesenteric fat.

impedes doing it with intravenous contrast. Such study reports signs of no complicated peritoneal inflammatory process discarding the possibility of an infectious bowel inflammatory process and ascitic fluid in little amount (**Fig. 1 y 2**).

From these findings, the patient is submitted to investigative laparotomy, where a 3.7 m extensive



**Figure 5.** Coronal plane with reduction of mesenteric fat.



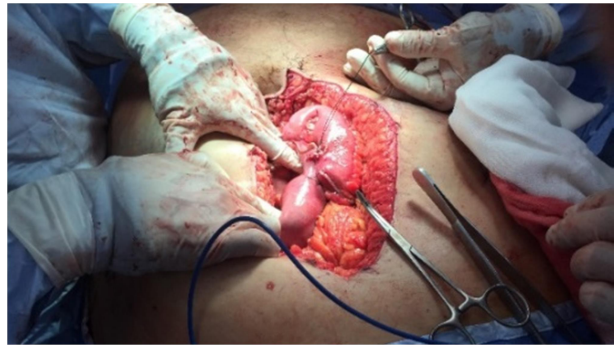
**Figure 6.** Bowel resection of the affected segment.

bowel ischemia is presented at the level of jejunum-ileum, with conservative management initially because of the important commitment at the level of the ileum-jejunum transition with partial increase of the reduction of the mesenteric fat (Fig 3, 4, 5). Low molecular weight heparin is administered with anticoagulation dose and a later secondary revision plan.

Intensive therapy is applied, where fluid reanimation and hemodynamic status optimization are started within 24 hours. However, the patient presents intraabdominal hypertension data resulting in a second revision within 24 hours after the initial surgery, where a reduction and a delimitation of the bowel ischemic process of 3.2 mts are seen (Fig. 6 y 7). Thus, a bowel resection of the affected segment is started and a mechanical entero-ental anastomosis, 50 cm on the ligament of Treitz and 20 cm on the ileocecal valve (Fig. 8), leaving a small bowel length of 70 cm.



**Figure 7.** Bowel resection of the affected segment is shown.



**Figure 8.** Mechanical jejunum-ileum anastomosis

Later the patient presents UTI, where he presents worsening of his conditions, with development of acute renal failure, hemodynamic instability and pulmonary dysfunction with acute pulmonary damage data, requiring support with amines, which were reduced gradually until they were disappeared. Renal function with Prism machine was replaced by continuous veno-venous technique for 48 hours, presenting improvement in the renal function. Transfusion of three globular packages were required. The patient was extubated after 6 days of the admission to intensive therapy tolerating the via oral after extubation. Discharge is decided after 10 days of the admission and the monitoring continues with external consultation. Currently the patient has a 50% weight loss without hemodynamic and metabolic decompensation.

## Discussion

Post bariatric vein mesenteric thrombosis (PVMT), related to the surgery, has been described in many cases reports<sup>17, 18</sup>. There are variable presentations, the clinical picture being little specific, however the majority agree with having abdominal pain that does not resolve, nausea and vomiting, it has a mortality rate of 5.2%, however it is thought that the real incidence is underestimated in the literature<sup>31</sup>. A history of thrombotic events in other levels (pulmonary and extremities) can be presented, in some occasions they are known with diseases associated to this kind of complications in a third of cases<sup>4,7</sup>. There are studies where it is said that a quarter of the cases will present melena or hematochezia with symptoms of a hours or weeks duration<sup>4,7</sup>, as it happened with this patient, which increased the suspicion index of presenting such complication.

The incidence is 0.09-0.2% of the emergency admissions<sup>31</sup>. In the specific case of obesity surgery, mesenteric vein thrombosis, after sleeve gastrectomy, was described for first time after a LSG by Berthet et al<sup>11</sup> in 2009. Salinas et al<sup>12</sup> informed that among 1,713 patients submitted to LSG, 17 patients (0.0.9%)



developed this complication. It is important to mention that the incidence of PMVT can be sub estimated in a similar manner of pulmonary embolism, due to there can be cases not as severe, which are solved spontaneously.<sup>24</sup>

Among findings in laboratories, leukocytosis, metabolic acidosis, LDH and CPK increase can be presented, which are usually synonyms of established necrosis, thus it results on wrong prognosis<sup>7, 25</sup>. The simple abdomen radiograph can be normal in 25% of the cases, the radiologic signs are late and these include ileum data in variable level, ascitic fluid, bowel digital images, bowel pneumatosis and gas in the portal vein.

The duplex doppler ultrasound has a sensitivity of 70-89% and specificity of 92-100%; however, it is useless to detect distal emboli in the superior mesenteric artery (SMA). The helical Angiotomography has the advantage of visualizing in three dimensions of the visceral arterial anatomy, giving 100% of sensitivity and specificity of 91% for stenosis detection of SMA. However, the contrasted angiography has been considered the gold standard for the visualization of the visceral vessels with 74-100 % of sensitivity and specificity close to 100%.<sup>25</sup>

In our case, we could not start the contrasted study due to the patient presented acute renal failure, thus clinical findings were correlated with tomographic findings in the CT scan.

The treatment purposes of the MVT are hemodynamic stability, through the adequate water replacement and the heart function optimization, the correction of the electrolytic alterations and the metabolic acidosis, the wide spectrum antibiotic administration via intravenous, normal pulsatile flow restauration of the SMA or affected vessel in the necessary cases, bowel flow restoration, the earliest possible, anticoagulant therapy, no viable bowel resection and start *second look* within 24 or 48 hours to evaluate marginal ischemia. If diffused bowel necrosis is presented and the bowel is not viable, it is better to close the abdomen without starting any therapy. Approximately, at least 50 cm of viable bowel are required if the ileocecal valve is optimized to maintain life<sup>26, 27</sup>.

In this case, the patient started with pain of a 6 hours duration before admission and hematochezia, with extensive initial affection to small bowel, thus we decided to improve the patient metabolic conditions during 24 hours without bowel resection, waiting for the surgery revision, which let us perfuse part of the bowel and delimit the affected anatomical area, where we saw a smaller delimitation of the thrombotic process than in the first surgery, letting us have a bowel of enough size for resection and anastomosis.

Venous thromboembolism is one of the main causes of mortality in patients undergoing bariatric

surgery. More than 80% of the events occur after hospital discharge, so thromboprophylaxis is a topic of constant debate.<sup>31,32</sup>

There are well-identified risk factors, which include heart failure, paraplegia, breathing difficulties, dyspnea at rest, being over 60 years old, male sex, BMI greater than 50 kg/m<sup>2</sup>, surgical time of 3 hours or more, and prolonged hospital stay.<sup>31,32</sup>

According to Amainan et. All. Gastric sleeve is associated with a higher risk compared to other bariatric procedures.<sup>31,32</sup>

## Conclusion

The patient's prognosis with this disease requires a high index of clinical suspicion. The surgical treatment, based on reanimation, anticoagulation and in the case, surgical aggressive treatment are fundamental for this case for the adequate post operatory evolution of the patient.

## Conflicts of interests

There was no conflict of interest during the study, and it was not funded by any organization.

## References

1. Cappell M. Intestinal (mesenteric) vasculopathy I. *Gastroenterol Clin North Am* 1998; 27: 783-825.
2. Valdés F. Isquemia mesentérica aguda. *Rev Chil Cir.* 1988; 40: 206-11.
3. Bañuelos OD, Onésimo ZR, García AJ, Parra SI. Trombosis de la arteria mesentérica superior: Reporte de un caso. *Rev Hosp Jua Méx.* 2010; 77 (2): 141-45.
4. Sánchez FP, Mier DJ, Blanco BR. Acute mesenteric ischemia: the face of an aggressive disease. *Rev gastroentelol Méx.* 2000; 65 (3):134-40.
5. Adams TD, Gress RE, Smith SC, et al. Long-term mortality after gastric bypass surgery. *N Engl J Med.* 2007;357(8):753-761
6. Buchwald H, Estok R, Fahrbach K, et al. Weight and type 2 diabetes after bariatric surgery: systematic review and meta-analysis. *Am J Med.* 2009;122(3):248.e5-256.e5
7. Chang J, Stein T. Mesenteric ischemia: acute and chronic. *Ann Vasc Surg.* 2003; 17:323-8
8. Thompson JS, Langnas AN, Pinch LW, Kaufman S, Quigley EM, Vanderhoof JA. Surgical approach to short-bowel syndrome. Experience in a population of 160 patients. *Ann Surg* 1995; 222: 600.
9. Klempnauer J, Grothues F, Bektas H, Pichlmayr R. Long-term results after surgery for acute mesenteric ischemia. *Surgery* 1997; 121: 239.
10. Acosta S, Ogren M, Sternby NH, Bergqvist D, Bjorek M. Incidence of acute thrombo-embolic of the superior mesenteric artery-A population based study. *Eur J Vasc Endovasc Surg.* 2004; 27: 145-50.
11. Hamad GG, Choban PS. Enoxaparin for thromboprophylaxis in morbidly obese patients undergoing bariatric surgery: findings of the prophylaxis against VTE outcomes in bariatric surgery patients

- receiving enoxaparin (PROBE) study. *Obes Surg.* 2005;15(10):1368-1374
12. Rocha AT, de Vasconcellos AG, da Luz Neto ER, Araújo DM, Alves ES, Lopes AA. Risk of venous thromboembolism and efficacy of thromboprophylaxis in hospitalized obese medical patients and in obese patients undergoing bariatric surgery. *Obes Surg.* 2006;16(12):1645-1655
  13. Herron DM. C-reactive protein and adiposity: obesity as a systemic inflammatory state. *Surg Obes Relat Dis.* 2005;1(3):385-386
  14. Pineda L, Sarhan M, Ahmed L. Superior mesenteric vein thrombosis after laparoscopic sleeve gastrectomy. *Surg Laparoscopic Endosc Percutan Tech.* 2013; 23 (4): 162-163.
  15. Becattini C, Agnelli G, Manina G, Noya G, Rondelli F. Venous thromboembolism after laparoscopic bariatric surgery for morbid obesity: clinical burden and prevention. *Surg Obes Relat Dis.* 2012;8(1):108-115
  16. Fichera A, Cicchiello LA, Mendelson DS, Greenstein AJ, Heimann TM. Superior mesenteric vein thrombosis after colectomy for inflammatory bowel disease: a not uncommon cause of postoperative acute abdominal pain. *Dis Colon Rectum.* 2003;46(5):643-648
  17. James AW, Rabl C, Westphalen AC, Fogarty PF, Posselt AM, Campos GM. Portomesenteric venous thrombosis after laparoscopic surgery: a systematic literature review. *Arch Surg.* 2009;144(6):520-526
  18. Berthet B, Bollon E, Valero R, Ouassiss M, Sielezneff I, Sastre B. Portal vein thrombosis due to factor 2 Leiden in the post-operative course of a laparoscopic sleeve gastrectomy for morbid obesity. *Obes Surg.* 2009;19(10):1464-1467
  19. Denne JL, Kowalski C. Portal vein thrombosis after laparoscopic gastric bypass. *Obes Surg.* 2005;15(6):886-889
  20. Johnson CM, de la Torre RA, Scott JS, Johansen T. Mesenteric venous thrombosis after laparoscopic Roux-en-Y gastric bypass. *Surg Obes Relat Dis.* 2005;1(6):580-582; discussion 582-583
  21. Pigeyre M, Seguy D, Arnalsteen L, Pattou F, Romon M. Laparoscopic gastric bypass complicated by portal venous thrombosis and severe neurological complications. *Obes Surg.* 2008;18(9):1203-1207
  22. Swartz DE, Felix EL. Acute mesenteric venous thrombosis following laparoscopic Roux-en-Y gastric bypass. *JSLs.* 2004;8(2):165-166
  23. Maalouf M, Papasavas P, Goitein D, Caushaj PF, Gagne D. Portal vein thrombosis after laparoscopic splenectomy for systemic mastocytosis: a case report and review of the literature. *Surg Laparosc Endosc Percutan Tech.* 2008;18(2):219-221
  24. Morpurgo M, Schmid C. The spectrum of pulmonary embolism: clinicopathologic correlations. *Chest.* 1995;107(1):(suppl) 18S-20S
  25. Kim A, Ha H. Evaluation of suspected mesenteric ischemia: efficacy of radiologic studies. *Radiol Clin North Am* 2003; 41: 327-42
  26. Edwards MS, Cherr GS, Craven TE, Olsen AW, Plonk GW, Geary RL, et al. Acute occlusive mesenteric ischemia: surgical management and outcomes. *Ann Vasc Surg* 2003; 17: 72.
  27. Kumar S, Sarr M, Kamath PS. Mesenteric venous thrombosis. *New Eng J Med* 2001; 345: 1683-1688.
  28. Barba CA, Harrington C, Loewen M. Status of venous thromboembolism prophylaxis among bariatric surgeons: have we changed our practice during the past decade? *Surg Obes Relat Dis.* 2009;5(3):352-356
  29. Mechanick JI, Kushner RF, Sugerman HJ, et al. American Association of Clinical Endocrinologists, The Obesity Society, and American Society for Metabolic & Bariatric Surgery Medical Guidelines for Clinical Practice for the perioperative nutritional, metabolic, and nonsurgical support of the bariatric surgery patient [published correction appears in *Surg Obes Relat Dis.* 2010;6(1):112]. *Surg Obes Relat Dis.* 2008;4(5):(suppl)
  30. Clinical Issues Committee of the American Society for Metabolic and Bariatric Surgery. Prophylactic measures to reduce the risk of venous thromboembolism in bariatric surgery patients. *Surg Obes Relat Dis.* 2007;3(5):494-495
  31. Bala M, Catena F, Kashuk J, De Simone B, Gomes CA, Weber D, et al. Acute mesenteric ischemia: updated guidelines of the world society of emergency surgery. *World J Emerg Surg.* 2022;17(1):54.
  32. Aminian, A., Andalib, A., Khorgami, Z., Cetin, D., Burguera, B., Bartholomew, J., Brethauer, S. A., & Schauer, P. R. (2017). Who Should Get Extended Thromboprophylaxis After Bariatric Surgery?: A Risk Assessment Tool to Guide Indications for Post-discharge Pharmacoprophylaxis. *Annals of surgery, 265*(1), 143–150. <https://doi.org/10.1097/SLA.0000000000001686>

Omar Felipe Gaytán Fuentes  
 Upper Gastrointestinal Robotic Surgery Fellowship  
 General Surgery Department  
 November 20th National Medical Center  
 ISSSTE.  
 México City, México.