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Splenoportal axis and superior mesenteric vein massive thrombosis after bariatric surgery

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Abstract

Overweight and obesity have become a global public health problem, with a significant negative impact on people's health. Bariatric surgery is the therapy that provides greater weight loss and a more significant effect on associated comorbidities. Venous thromboembolism and portal venous system thrombosis (PSVT) is a rare (0.13%-1%) and potentially lethal complication of bariatric surgery. Objective: determine the rate of PSVT after bariatric surgery in our series. For this purpose, a retrospective observational study of bariatric surgery interventions was carried out over 20 months. The case of a patient with massive thrombosis of the spleno-portal axis during the postoperative period of a sleeve gastrectomy for morbid obesity is presented. SPVT is an uncommon complication after bariatric surgery but potentially fatal, so a high level of clinical suspicion is essential to be able to start treatment early. The extended prophylactic anticoagulation protocol can reduce its incidence.

Keywords:

- Thrombosis of the splenoportal axis
- Bariatric surgery
- Sleeve gastrectomy

Introduction

Overweight and obesity have become a global public health problem, with a significant negative impact on people's health. There are different therapeutic options, with bariatric surgery being the one that provides greater weight loss and a more significant effect on associated comorbidities. However, it is not free of complications: bleeding, leak, anastomotic stenosis, venous thromboembolism and portal venous system thrombosis (PSVT), among others. With an incidence between 0.13%-1% depending on the series, PSVT represents a potentially lethal complication of bariatric surgery.(1,2) Our objective is to report our experience in a case of PSVT and evaluate the incidence in our series.

Material and method

Between April 2019 and December 2021, 147 bariatric surgery interventions were performed in our center, 83 vertical gastrectomies or gastric sleeves (56.5%) and 64 gastric bypasses (43.5%). They were performed on a scheduled basis and with a completely laparoscopic approach. All patients undergo nutritional prehabilitation during the 2 weeks prior to the intervention and postoperative follow-up, both in-hospital and outpatient, by Nutrition. They are discharged with a long 30-day regimen of antithrombotic prophylaxis with low molecular weight heparin. During subsequent follow-up, 1 case of massive thrombosis of the spleno-portal axis and superior mesenteric vein was recorded, which represents 0.68%.

Results

We present the case of a 55-year-old patient with a personal history of hyperuricemia and grade III or morbid obesity with a Body Mass Index (BMI) of 41.8 kg/m2 (weight 113.8kg and height 1.65m). The preoperative study showed

moderate hepatic steatosis on abdominal ultrasound and antral reactive gastropathy on upper gastrointestinal endoscopy, with negative Helicobacter pylori. Surgical intervention was performed, performing laparoscopic vertical gastrectomy with 5 trocars and pneumoperitoneum of 15 mm Hg on a 36Fr Foucher probe, performing the section at 4 cm from the pylorus with a mechanical linear endostapler; No intraoperative incidents were recorded and the tightness was checked with methylene blue. During the immediate postoperative period, no complications were recorded and she was discharged after 48 hours, with low molecular weight heparin at a prophylactic dose (enoxaparin 80mg/24H) and compression stockings (Caprini Scale: 7; high risk $^{3}5$; being the risk of deep vein thrombosis of 6% in the absence of prophylaxis stockings), according to the recommendations of the Working Group sponsored by the Spanish Society of Obesity Surgery (SECO) and the Obesity Section of the Spanish Association of Surgeons (AEC) of the year 2021.3 He went to the emergency room on the nineteenth postoperative day (PO) due to pain in the left hypochondrium, nausea and dyspnea (BP 128/97mmHg, HR 114, O2 saturation 97%). Physical examination rules out signs of peritoneal irritation. The blood analysis highlights C-reactive protein 18mg/dL (<0.5mg/dL), 11700¼L leukocytes (3900 µL -10200 µL), 57% neutrophilia (42%-77%), lipase 324U/L (<67U/ L), hemoglobin 15.9g/dL (12.0 g/dL-16.5 g/dL), prothrombin activity 87% (80-120%). An abdominal CT scan with contrast was performed, which described massive thrombosis of the splenoportal axis and superior mesenteric vein (SVM), which led to altered liver perfusion, splenic infarction, and hypoperfusion of small intestine loops (Figure 1 and 2). Given hemodynamic stability and absence of peritonism, conservative treatment was initiated with digestive rest, antibiotic prophylaxis and anticoagulation with unfractionated heparin at a therapeutic dose (80 mg/12H). After initial observation and reintroduction of oral diet, she was discharged with low molecular weight heparin (enoxaparin 150 mg/24H), as a bridge therapy to oral anticoagulation (acenocoumarol) for 6 months based on the evaluation of recanalization in imaging tests; accompanied by controls with anti-Xa. The thrombophilia study determined heterozygosity for C677T, a gene involved in homocysteine metabolism, and homocysteine levels 7.27 (5-15mmol/L).

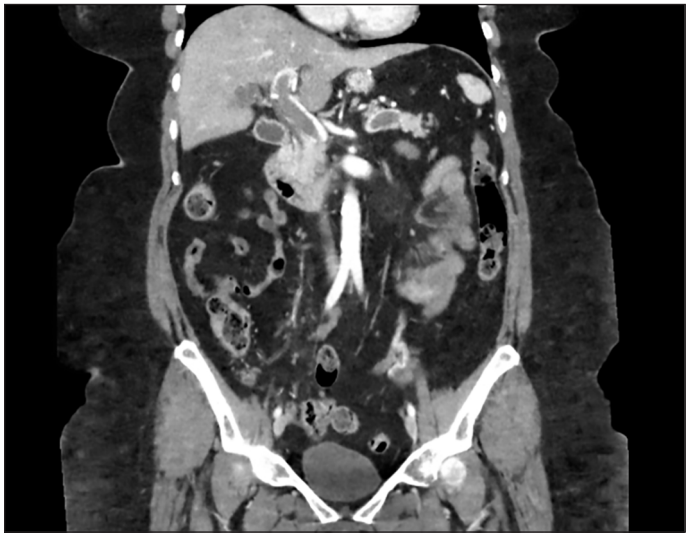

Figure 1. Coronal image of abdominal CT with findings of massive thrombosis of the splenoportal axis and superior mesenteric vein.

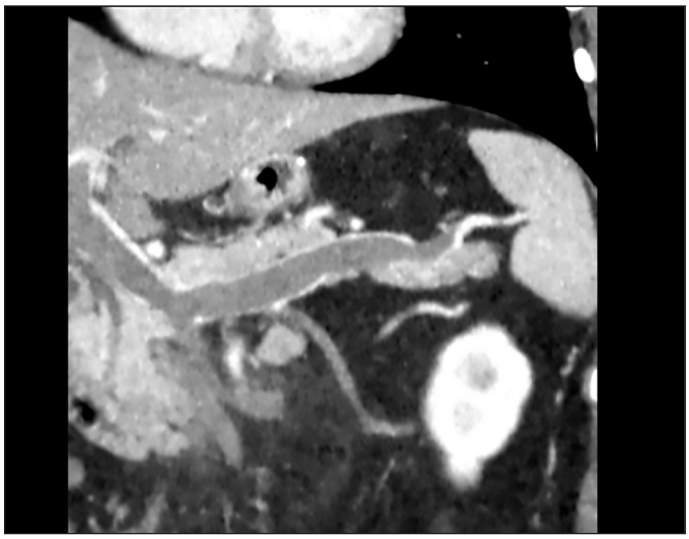

Figure 2. Coronal multiplanar reconstruction with finding of massive splenoportal thrombosis.

Discussion

PSVT can present acutely (<60 days PO), often asymptomatic or transient, and is diagnosed incidentally through imaging tests during the follow-up of bariatric surgery; Therefore, the real incidence could be underestimated. If it occurs chronically, it alters hepatic flow due to portal

cavernomatosis, which produces portal hypertension and chronic liver disease (ascites, esophageal varices, hypersplenism...).

Its etiology is multifactorial: prothrombotic states (oncology, smoking, DM2...), thrombophilias (elevated FVIII, the most common), intra-abdominal pressure due to pneumoperitoneum >14mmHg, etc. It has been more closely related to vertical gastrectomy compared to gastric bypass or gastric banding. The use of a liver retractor that can cause congestion of the liver, the ligation of the vessels of the greater curvature that increases gastric and splenic venous flow, or possible traction of the splenic vein when releasing the greater omentum are some of the possible causes that justify this difference between procedures.(4-7)

A clear benefit of anticoagulation in preventing SVT has not been demonstrated, and it may increase the risk of bleeding. Extended regimens (1-4 weeks PO) could present a lower incidence in selected high-risk patients.(1)

Once diagnosed and in the absence of hemodynamic instability or peritoneal irritation, anticoagulant therapy should be initiated at a therapeutic dose that will continue for 3-6 months. Surgical intervention should be reserved for cases of acute mesenteric ischemia.(8, 9)

Despite being a rare complication (<1%), the presentation of PSVT after bariatric surgery can be lethal with mortality rates of 1.33%.(1)

Conclusions

For all these reasons, SPVT is a rare but potentially fatal complication after bariatric surgery, which is why a high level of clinical suspicion is essential to be able to start treatment early. The type of intervention performed as well as the experience of the surgical team may be associated with the risk of developing PVT. The extended prophylactic anticoagulation protocol can reduce its incidence.

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References

1. Luo L, Li H, Wu Y, et al. Portal venous system thrombosis after bariatric surgery: A systematic review and meta-analysis. Surgery. 2021;170:363-372. doi: 10.1016/j.surg.2021.03.005.

2. Rottenstreich A, Elazary R, Kalish Y. Abdominal thrombotic complications following bariatric surgery. surg obes relat dis. 2017;13(1):78-84. doi: 10.1016/j.soard.2016.05.012.

3. Recomendaciones del Grupo de Trabajo auspiciado por la Sociedad Española de Cirugía de la Obesidad y Enfermedades Metabólicas y la Sección de Obesidad de la Asociación Española de Cirujanos. Profilaxis tromboembólica en cirugía bariatrica. Versión 2021.

4. Shoar S, Saber A, Rubenstein R, Safari S, et al. Portomesentric and splenic vein thrombosis (PMSVT) after bariatric surgery: a systematic review of 110 patients. Surg Obes Relat Dis. 2018;14(1):47-59. doi: 10.1016/j.soard.2017.09.512.

5. Franco J, Del Castillo J, Velásquez Á, Martínez J. Trombosis portal tras Cirugía Bariátrica Laparoscópica. Revision y aporte de 3 nuevos casos. Bariátrica y Metabólica Ibero-americana. 2011;1(2):150-154.

6. Goitein D, Matter I, Raziel A, et al. Portomesenteric thrombosis following laparoscopic bariatric surgery: incidence, patterns of clinical presentation, and etiology in a bariatric patient population. JAMA Surg. 2013 Apr;148(4):340-6. doi: 10.1001/jamasurg.2013.1053.

7. El Lakis MA, Pozzi A, Chamieh J, Safadi B. Portomesenteric vein thrombosis after laparoscopic sleeve gastrectomy and laparoscopic Roux-en-Y gastric bypass: a 36-case series. Surg Endosc. 2017 Mar;31(3):1005-1011. doi: 10.1007/s00464-016-5078-4.

8. Belnap L, Zaveri H, Cottam D, Surve A, Rodgers G, Drury C. What is the optimal treatment of superior mesenteric vein/portal vein thrombosis after bariatric surgery? Is SMA-directed t-PA the answer?. Surg Obes Relat Dis. 2017;13(3):533-537. doi: 10.1016/j.soard.2016.11.015.

9. Moon RC, Ghanem M, Teixeira AF, et al. Assessing risk factors, presentation, and management of portomesenteric vein thrombosis after sleeve gastrectomy: a multicenter case-control study. Surg Obes Relat Dis. 2018 Apr;14(4):478-483. doi: 10.1016/j.soard.2017.10.013.