



CASE REPORT

Gastric Variceal Bleeding Secondary to Splenic Vein Thrombosis: A Case of Left-Sided Portal Hypertension

Benjamin W. Quick, M.D., MPH¹, Gilbert Kisang, M.D.²,
William J. Salyers, Jr., M.D., MPH²

¹University of Kansas Medical Center, Department of Internal Medicine, Kansas City, KS

²University of Kansas School of Medicine-Wichita, Department of Internal Medicine, Wichita, KS

INTRODUCTION

Gastric varices are found most frequently in patients with portal hypertension.¹ While gastric varices bleed less than esophageal varices, bleeding from gastric varices is often more severe and life threatening. A less common but significant cause of gastric varices is due to isolated left-sided portal hypertension (LSPH).² We present a case of bleeding gastric varices secondary to LSPH caused by a splenic vein thrombosis (SVT).

CASE REPORT

A 71-year-old male presented to his local emergency department after several black stools, dizziness, and an episode of syncope. His medical and surgical history included coronary artery disease with multiple stent placements, a pacemaker placement, and warm autoimmune hemolytic anemia diagnosed a month prior to presentation. An esophagogastroduodenoscopy (EGD) at this outside facility revealed what was thought to be a gastric ulcer along with two gastric polyps. The polyps were biopsied and the patient was sent home to follow-up with a colonoscopy a few days later.

The patient presented to our hospital, a regional referral center, the following evening and was admitted due to persistent symptoms of dizziness and dark stools. An abdominal exam was unremarkable for any tenderness to palpation or organomegaly. His blood pressure was 97/75 mmHg, pulse rate was 114 bpm, hemoglobin level was 5.9 g/dL, platelet count was 65,000/ μ L, lactic acid was 3.2 mmol/L, lactate dehydrogenase was 326 U/L, and liver function tests were unremarkable. On day two of hospitalization, a Technetium-99m red blood cell scan failed to localize any active bleeding, however, a repeat EGD revealed a large amount of hematin material and non-bleeding gastric varices in

the gastric fundus consistent with isolated gastric varices type 1 (IGV1) by Sarin classification (Figure 1).¹ No endoscopic therapy was done. An abdominal ultrasound showed a patent portal vein but body habitus precluded the visualization of the splenic vasculature. An abdominal computed tomography angiography (CTA) scan on hospital day three showed a splenic vein thrombosis and a small superior splenic infarction. Surrounding structures, including the pancreas, appeared normal. The patient underwent an uncomplicated splenectomy on hospital day five and was sent home on hospital day nine. He was to follow-up with his primary care provider 14 days after his splenectomy to receive pneumococcal, Haemophilus, and meningococcal vaccines.

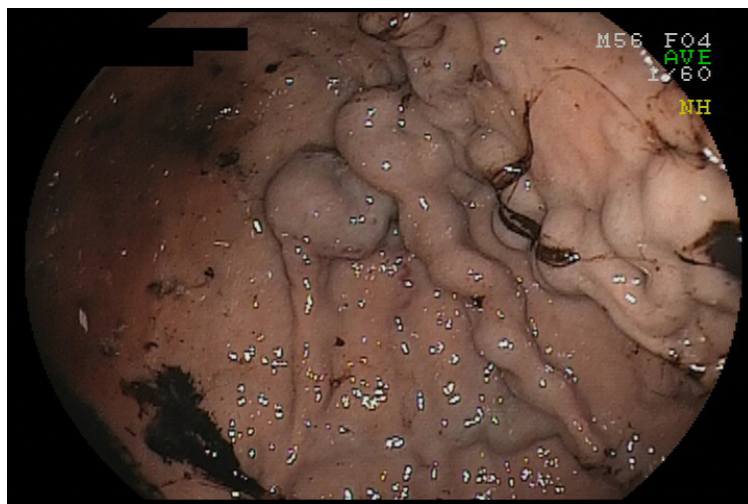


Figure 1. Isolated gastric varices in the gastric fundus.

DISCUSSION

LSPH is a less common, but significant cause of gastric varices that arises from any process that blocks blood flow through the splenic vein.^{3,4} Blockage results in left-sided venous hypertension forcing splenic blood to back up through collaterals, commonly the short gastric veins, forming varices in submucosal gastric vessels. Obstruction is usually intravascular due to a SVT, however, less common causes of splenic vein compression by nearby organs, tumors, and other processes have been documented. SVT most commonly is due to disease processes in the pancreas because it lies directly anterior to the splenic vein. Acute and chronic pancreatitis account for 60% of SVTs and pancreatic malignancies account for 9%.⁵

Most patients with LSPH secondary to SVT are asymptomatic and an SVT is found incidentally on imaging for other reasons.⁶⁻⁹ Symptomatic patients, such as ours, usually present with GI variceal bleeding (45 - 72%)^{5,10} and abdominal pain (25 - 38%).^{5,10,11} Splenomegaly is a variable finding and was not found in our patient. In a meta-analysis of patients with pancreatitis induced SVT, splenomegaly was only present in 51.9% of patients,¹² however, some studies suggest it is closer to 71%.¹⁰ Ascites is rarely found as a presenting sign in LSPH.¹³ Laboratory values can vary depending on the underlying etiology of the SVT, however, low hemoglobin suggests variceal bleeding. Nonetheless, a constellation of signs and symptoms should be

considered. This was especially important with our patient who already had low hemoglobin secondary to hemolytic anemia.

Doppler ultrasonography (US) is a common preliminary test to evaluate for SVT in patients with symptomatic LSPH. While fairly sensitive and specific (93% and 83%)^{14,15} for finding portal vein thrombosis, the anatomic location of the splenic vein often makes it difficult to evaluate its patency, as was the case with our patient.¹⁵ In patients whose treatment likely will require splenectomy, more comprehensive imaging allowing visualization of the entire portal system, such as computed tomography (CT) or magnetic resonance imaging (MRI), is more favorable.¹⁶ In patients where pancreatic malignancy is suspected to be the cause of SVT, such as patients without a history of pancreatitis, endoscopic ultrasound (EUS) is used frequently because of its superiority to US and CT in diagnosing small pancreatic lesions and visualizing vascular invasion.^{17,18}

Once the diagnosis of gastric varices caused by SVT-induced LSPH has been made, treatment is based on whether the varices ever have bled. In patients with active bleeding, intravascular cyanoacrylate injection is the first line therapy to achieve hemostasis when available.¹⁹ Other methods include banding or injection of a sclerosant. Once hemostasis is achieved or in patients with refractory bleeding, splenectomy is the treatment of choice,^{3,8,12,20-23} because rebleed rates without it range from 4 - 17%.^{7,8,24} Two studies have shown a 0% rebleed rate after splenectomy for previously bleeding gastric varices caused by LSPH.^{5,6} Cyanoacrylate injection can be used as definitive therapy in other types of gastric varices, but due to the amount of collateral connections between the stomach and splenic vein, splenectomy is favored in cases of varices due to SVT. Splenic artery embolization can be used as an alternative to splenectomy in high-risk surgical patients, however, splenic abscesses can occur in up to 7% of patients following the procedure.²⁵ Further studies are needed to confirm the efficacy of embolization for first line therapy.^{3,26} In the absence of any previous bleed, current literature suggests against prophylactic splenectomy.⁸ Heider et al.⁸ showed a bleeding rate of only 3.8% in patients with pancreatitis-induced SVT followed conservatively over 34 months.

Patients who undergo functional or surgical splenectomy require pneumococcal, Haemophilus, and meningococcal vaccines 14 days prior to the procedure. If urgent splenectomy is required, as was in our patient, vaccines should be administered at least 14 days following the procedure.²⁷ Studies with the pneumococcal vaccine suggest this timing allows for subsequently higher antibody concentrations.²⁸⁻³⁰ Revaccinations are required and should be administered in accordance with the Infectious Diseases Society of America (IDSA) recommendations for vaccination of patients with asplenia.²⁷

Prognosis is largely dependent on the underlying etiol-

ogy of the SVT. Treatment effectiveness often is evaluated by assessing for recurrence of bleeding, however, this is difficult because a large proportion of the patients have an underlying malignancy and their life expectancy is short.

Our case highlights the importance of accurate diagnosis and work-up of gastric varices caused by LSPH. It reminds physicians of the different causes of LSPH and what diagnostic and therapeutic approaches are available for addressing gastric varices caused by LSPH secondary to SVT.

REFERENCES

- Sarin S, Kumar A. Gastric varices: Profile, classification, and management. *Am J Gastroenterol* 1989; 84(10):1244-1249. PMID: 2679046.
- Alam H, Kim D, Provido H, Kirkpatrick J. Portal vein thrombosis in the adult: Surgical implications in an era of dynamic imaging. *Am Surg* 1997; 63(8):681-684; discussion 684-685. PMID: 9247433.
- Köklü S, Çoban Ş, Yüksel O, Arhan M. Left-sided portal hypertension. *Dig Dis Sci* 2007; 52(5):1141-1149. PMID: 17385040.
- Chen BC, Wang HH, Lin YC, Shih YL, Chang WK, Hsieh TY. Isolated gastric variceal bleeding caused by splenic lymphoma-associated splenic vein occlusion. *World J Gastroenterol* 2013; 19(40):6939-6942. PMID: 24187474.
- Moossa A, Gadd MA. Isolated splenic vein thrombosis. *World J Surg* 1985; 9(3):384-390. PMID: 4013353.
- Sakorafas GH, Sarr MG, Farley DR, Farnell MB. The significance of sinistral portal hypertension complicating chronic pancreatitis. *Am J Surg* 2000; 179(2):129-133. PMID: 10773149.
- Agarwal AK, Kumar K R, Agarwal S, Singh S. Significance of splenic vein thrombosis in chronic pancreatitis. *Am J Surg* 2008;196(2):149-154. PMID: 18585674.
- Heider TR, Azeem S, Galanko JA, Behrns KE. The natural history of pancreatitis-induced splenic vein thrombosis. *Ann Surg* 2004; 239(6):876-880, discussion 880-882. PMID: 15166967.
- Weber SM, Rikkers LF. Splenic vein thrombosis and gastrointestinal bleeding in chronic pancreatitis. *World J Surg* 2003; 27(11):1271-1274. PMID: 14502405.
- Madsen MS, Petersen TH, Sommer H. Segmental portal hypertension. *Annals Surg* 1986; 204(1):72-77. PMID: 3729585.
- Köklü S, Yüksel O, Arhan M, et al. Report of 24 left-sided portal hypertension cases: A single-center prospective cohort study. *Dig Dis Sci* 2005; 50(5):976-982. PMID: 15906778.
- Butler JR, Eckert GJ, Zyromski NJ, Leonardi MJ, Lillemoie KD, Howard TJ. Natural history of pancreatitis-induced splenic vein thrombosis: A systematic review and meta-analysis of its incidence and rate of gastrointestinal bleeding. *HPB (Oxford)* 2011;13(12):839-845. PMID: 22081918.
- Witte CL, Chung YC, Witte MH, Sterile O, Cole WR. Observations on the origin of ascites from experimental extrahepatic portal congestion. *Ann Surg* 1969; 170(6):1002-1015. PMID: 5352636.
- Johansen K, Paun M. Duplex ultrasonography of the portal vein. *Surg Clin North Am* 1990; 70(1):181-190. PMID: 2406966.
- Alpern M, Rubin J, Williams D, Capek P. Porta hepatis: Duplex Doppler US with angiographic correlation. *Radiology* 1987; 162(1 Pt 1):53-56. PMID: 3538152.
- Naik KS, Ward J, Irving HC, Robinson PJ. Comparison of dynamic contrast enhanced MRI and Doppler ultrasound in the pre-operative assessment of the portal venous system. *Br J Radiol* 1997;70:43-49. PMID: 9059294.
- Wiersema MJ, Kochman ML, Cramer HM, Tao LC, Wiersema LM. Endosonography-guided real-time fine-needle aspiration biopsy. *Gastrointest Endosc* 1994;40(6):700-707. PMID: 7859968.
- Rösch T, Lorenz R, Braig C, et al. Endoscopic ultrasound in pancreatic tumor diagnosis. *Gastrointest Endosc* 1991;37(3):347-352. PMID: 2070987.
- Garcia-Isa G, Sanyal AJ, Grace ND, et al. Prevention and management of gastroesophageal varices and variceal hemorrhage in cirrhosis. *Hepatology* 2007; 46(3):922-938. PMID: 17879356.
- Lee Y-B, Kim SM, Heo J-S, et al. Idiopathic splenic vein thrombosis presenting as splenic infarction and consequent gastric variceal bleeding. *J Lipid Atheroscler* 2014; 3(2):111-115.
- Uppal D, Henry Z, Al-Osaimi A, Saad W, Caldwell S. Management of gastric varices. *Curr Hepatol Rep* 2014; 13:208-217.

- ²² Thavanathan J, Heughan C, Cummings TM. Splenic vein thrombosis as a cause of variceal bleeding. *Can J Surg* 1992;35(6):649-652. PMID: 1458393.
- ²³ Al-Osaimi AM, Caldwell SH. Medical and endoscopic management of gastric varices. *Semin Intervent Radiol* 2011;28(3):273-282. PMID: 22942544.
- ²⁴ Caldwell S, Hespenheide E, Greenwald B, Northup P, Patrie J. Enbucrilate for gastric varices: Extended experience in 92 patients. *Aliment Pharmacol Ther* 2007; 26(1):49-59. PMID: 17555421.
- ²⁵ Ekeh AP, Khalaf S, Ilyas S, Kauffman S, Walusimbi M, McCarthy MC. Complications arising from splenic artery embolization: A review of an 11-year experience. *Am J Surg* 2013; 205(3):250-254. PMID: 23375704.
- ²⁶ Stone PA, Phang D, Richmond B, Gill G, Campbell JE. Splenic artery embolization for the treatment of bleeding gastric varices secondary to splenic vein thrombosis. *Ann Vasc Surg* 2014; 28(3):737. PMID: 24495333.
- ²⁷ Rubin LG, Levin MJ, Ljungman P, et al. 2013 IDSA clinical practice guideline for vaccination of the immunocompromised host. *Clin Infect Dis* 2014; 58(3):309-318. PMID: 24421306.
- ²⁸ Shatz DV, Romero-Steiner S, Elie CM, Holder PF, Carlone GM. Antibody responses in postsplenectomy trauma patients receiving the 23-valent pneumococcal polysaccharide vaccine at 14 versus 28 days postoperatively. *J Trauma* 2002; 53(6):1037-1042. PMID: 12478024.
- ²⁹ Shatz DV, Schinsky MF, Pais LB, Romero-Steiner S, Kirton OC, Carlone GM. Immune responses of splenectomized trauma patients to the 23-valent pneumococcal polysaccharide vaccine at 1 versus 7 versus 14 days after splenectomy. *J Trauma* 1998; 44(5):760-765. PMID: 9603075.
- ³⁰ Konradsen HB, Rasmussen C, Ejstrup P, Hansen JB. Antibody levels against streptococcus pneumoniae and Haemophilus influenzae type b in a population of splenectomized individuals with varying vaccination status. *Epidemiol Infect* 1997; 119(2):167-174. PMID: 9663015.

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