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Original articles

Assessing risk factors, presentation, and management of portomesenteric vein thrombosis after sleeve gastrectomy: a multicenter case-control study

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Abstract

Background: Portomesenteric vein thrombosis (PMVT) is a rare complication of laparoscopic sleeve gastrectomy.

Objectives: To identify incidence, patient factors, diagnosis, and treatment of PMVT after laparoscopic sleeve gastrectomy in a large administrative data registry.

Setting: Academic Hospitals and Private Practices, United States.

Methods: A retrospective chart review of 5538 sleeve gastrectomy patients between January 1, 2008 and September 30, 2016 was performed at 5 bariatric centers in the United States. A total of 11 patients were identified as developing PMVT, and 3 controls for each patient were selected by matching age, sex, preoperative body mass index, and center.

Results: After adjusting for confounding variables, 2 patient factors significantly impacted the risk of PMVT after sleeve gastrectomy including personal history of malignancy (odds ratio 62, 95% confidence interval (CI) 1.4–99.9), and type 2 diabetes (odds ratio 12.7, 95% CI 1.2–137.3) compared with controls. Mean period from laparoscopic sleeve gastrectomy to presentation of PMVT was 19.3 ± 15.11 days (range, 8–62). All patients except 1 complained of abdominal pain as the main presenting symptom. Other complaints included nausea and vomiting, no bowel movement, decreased appetite, diarrhea, and dehydration, and leukocytosis was present in 45.5% of the patients. All diagnoses were made by using computed tomography. All initial treatments were anti-coagulation, heparin drip being the most common method (90.9%). Of patients, 9 (81.8%) required a secondary anticoagulation therapy, and 1 (9.1%) patient required a reoperation.

Conclusion: Incidence of PMVT is low after sleeve gastrectomy. A personal history of malignancy and type 2 diabetes increase the risk of PMVT. Increasing abdominal pain in a context of dehydration is common presenting symptoms with diagnosis confirmed by computed tomography.

The abstract of this article has been selected to present at International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) 2017 Annual Meeting (Aug 29–Sep 2, 2017, London, UK).

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Anticoagulation is the standard treatment. There was no mortality associated with the occurrence of PMVT in this cohort. (Surg Obes Relat Dis 2017;■:00–00.) © 2017 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Portomesenteric vein thrombosis; Sleeve gastrectomy; Portal vein thrombosis; risk factors

Morbid obesity is the disease of the twenty-first century, with an increasing incidence in both adults and adolescents [1]. Bariatric surgery is a proven mean to assist morbidly obese patients to lose weight, and maintain that weight loss, with a significant and positive impact on morbid obesity-related co-morbidities [2]. As a result, the number of bariatric procedures performed annually is increasing both in the United States and worldwide. Currently, metabolic and bariatric procedures are the most commonly performed gastrointestinal procedures in the United States [3]. However, the procedure can have many complications ranging from staple line leaks to bleeding [4]. This patient population is at increased risk for venous thromboembolism (VTE) at baseline [5]. The risk is further amplified after the surgery. Portomesenteric vein thrombosis (PMVT) is a rare complication after laparoscopic sleeve gastrectomy (LSG) [6]. It is a well-described complication after many procedures, such as liver transplantation and splenectomy [7,8], and has been reported in all spectrums of the bariatric procedures [6]. After SG, it is reported to occur at an approximate rate of .3% [6]. The etiology for PVMT postbariatric procedures seems to be multifactorial, with many suggestions in the literature ranging from systemic factors such as a hypercoagulable state to local factors such as thrombosis secondary to dissection around the splanchnic vasculature [9]. This retrospective case-control study reports the cases of 11 patients who underwent a SG at 5 different centers in the United States and suffered from PMVT, not only analyzing potential causative factors, but symptomatology, diagnosis, treatment, and their course of the disease.

Methods

After institutional review board approval and following the Health Insurance Portability and Accountability Act guidelines, the authors performed a retrospective chart review of a prospectively maintained database of 5538 patients at 5 bariatric centers in the United States who underwent LSG between January 1, 2008 and September 30, 2016. Among these, a total of 11 patients were identified as developing PMVT after LSG. Patients were identified when they were readmitted and the diagnosis was confirmed with computed tomography (CT). For each patient, 3 controls were selected using caliper-matching age by 5 years, caliper-matching preoperative body mass index (BMI) by 5 kg/m², and exact matching by sex and center. Controls were selected after a chart review, and next

available patient was selected when he or she met the criteria for inclusion.

None of the patients routinely received a preoperative chemical prophylaxis, including Lovenox (Sanofi US, Bridgewater, NJ) and Heparin.

LSG was performed according to the National Institutes of Health criteria for the surgical management of morbid obesity. Patients were followed up at each office clinic at 1-, 3-, 6-, 12-months postoperatively, and yearly thereafter. Follow-up visits included weight measurement, clinical history and examination, and laboratory tests for blood glucose, as well as nutrition deficiency.

Statistical analysis was performed using SAS software version 9.4 (SAS Institute Inc.). All data for age and BMI are demonstrated as mean ± standard deviation, unless otherwise noted. Types of analysis include descriptive analysis, Fisher's exact test, and logistic regression with $P < .05$ regarded as statistically significant. Conditional logistic regression model was fitted to accurately analyze the matched data, history of cancer, current smoking status, diabetes status, and levothyroxine use as exposure variables.

Results

Demographic characteristics of cases and controls are shown in Table 1. The 2 groups were comparable at baseline in terms of sex, age, and preoperative BMI. The incidence of PMVT per center is shown in Table 2. No mortality occurred in relation to PMVT. Only 1 of the cases was detected to be in hypercoagulable state before the

Table 1
Demographic characteristics of portomesenteric vein thrombosis case and control patients

Characteristics	Cases	Controls	<i>P</i> value
Sex (n)			> .99
Female	8 (72.7%)	24 (72.7%)	
Male	3 (27.3%)	9 (27.3%)	
Age, yr	49.9 ± 11.5 (range, 30–67)	50.8 ± 10.8 (range, 30–69)	.82
Preoperative BMI, kg/m ²	43.7 ± 4.1 (range, 36.1–51.6)	44.2 ± 3.7 (range, 36.3–51.2)	.68
Co-morbidities			
Diabetes	6 (54.6%)	9 (27.3%)	
Hypertension	7 (63.6%)	18 (54.6%)	
Obstructive sleep apnea	4 (36.4%)	13 (39.4%)	
Hyperlipidemia	6 (54.6%)	14 (42.4%)	

BMI = body mass index.

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