

Case Report

May-Thurner Compressive Syndrome Unmasked by Rapid Weight Loss

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Abstract

Description

May-Thurner Syndrome (MTS) is an anatomical syndrome characterized by a predisposition to clot formation when there is compression of the left iliac vein by the right iliac artery. In this case, we discuss an atypical presentation of MTS in a young male after rapid weight loss. The patient was admitted for an unprovoked massive proximal deep vein thrombosis (DVT) after a two-hundred-pound weight loss during the preceding six-month period. Treatment involved mechanical thrombectomy by interventional radiology, initiation of apixaban and recommended follow up with vascular surgery for angioplasty instead of immediate stent placement.

Keywords

May-Thurner syndrome; bariatric surgery; compressive syndromes; iliac vein compression syndrome; deep vein thrombosis; DVT; provoked DVT; weight loss

Introduction

MTS is an anatomical variation wherein left iliac vein compression by the right iliac artery can lead to venous intimal hyperplasia and an increased predisposition to the formation of DVT.¹ Many patients with this anatomic variant may be asymptomatic or have swelling in the left lower extremity (LLE).² With substantial occlusion of the left iliofemoral venous system, the altered hemodynamic flow increases the propensity for clot formation and subsequent DVT. MTS most commonly occurs in women in their 20s and 30s, and can be precipitated by dehydration, cancer, pregnancy and/or oral contraceptive use.³ Previous literature indicates that women are five times more likely to suffer from MTS compared to men.⁴ Historically, there have been debates about whether treatment should include stenting of the vein to maintain patency, pursuing vascular angioplasty or maintaining patients on lifelong anticoagulation.⁴

Rapid weight loss has been associated with compressive syndromes such as Superior

Mesenteric Artery Syndrome due to the loss of retroperitoneal fat due to rapid weight loss.⁵ This case is unique because it is an example of a male patient who developed a DVT subsequent to rapid weight loss in a relatively short time frame. More importantly, this case highlights the need to consider MTS as a provoking factor for clot formation in patients that have undergone bariatric surgery. This is significant since MTS management is different than other provoking factors for DVT.

Case Presentation

A 19-year-old formerly-obese Caucasian male with a history significant for a 200-pound weight loss since undergoing bariatric surgery six-months prior, presented for acute left thigh swelling, erythema and pain for one day. He was found to be afebrile with tachycardia, mildly elevated blood pressure, normal respirations and oxygen saturation above 99% on room air. Evidence of rapid weight loss was present with laxity in the patient's skin. The LLE had palpable cords from the inguinal canal to the popliteal fossa with a clear margin of erythema and



Figure 1. CT Pelvis with contrast shows compression of the left iliac vein where the right iliac artery (arrow) traverses over the vein.

associated tenderness. Initial laboratory results showed leukocytosis of $13.2 \times 10^3/\mu\text{L}$, but otherwise normal hemoglobin, platelets and international normalized ratio (INR). Venous Doppler of the LLE demonstrated occlusive thrombus extending from the left common femoral vein through the popliteal vein into the left posterior tibial vein. A computed tomography (CT) scan of the pelvis reported concerns for a possible left psoas abscess or inflammation.

The patient was initially started on apixaban 10mg twice a day for treatment of venous thrombus, and hematology was consulted for evaluation of the patient's extensive and suspected unprovoked thrombus. The suspicion for MTS was increased after the hematologist's review of patient's CT scan highlighted that the patient's anatomy may be seen in MTS cases. (**Figure 1**) The recommendation was made to obtain additional imaging, and a magnetic resonance imaging (MRI) scan of the pelvis with and without contrast showed an occluded and compressed left common iliac vein where it transverses under the right common iliac artery. (**Figure 2**) The MRI results were consistent with a diagnosis of MTS. As the MRI was obtained on day three of hospitalization,

the patient was subsequently switched from apixaban 10mg twice daily to a heparin drip and interventional radiology was consulted for mechanical thrombectomy.

The patient underwent successful alteplase (TPA)-directed infusion via shunt placement in the most distal segment of the greater saphenous vein for 24 hours prior to successful catheter-guided mechanical thrombectomy. The patient was discharged on the sixth day of hospitalization and recommended to continue apixaban 5mg tablet twice daily after completing one week of 10mg twice daily dosing. The decision was made not to place a stent at this time due to the patient's age and possible complications of stent placement over the life of the device. The patient was also advised to follow up with a vascular surgeon to discuss the possibility of angioplasty to address this anatomic malformation and he was educated on the importance of continuing anticoagulation for at least three months, or until vascular surgery evaluation indicated otherwise.

Discussion

Rapid weight loss is well known to cause compressive syndromes like median arcuate ligament syndrome (MALS), superior mesen-

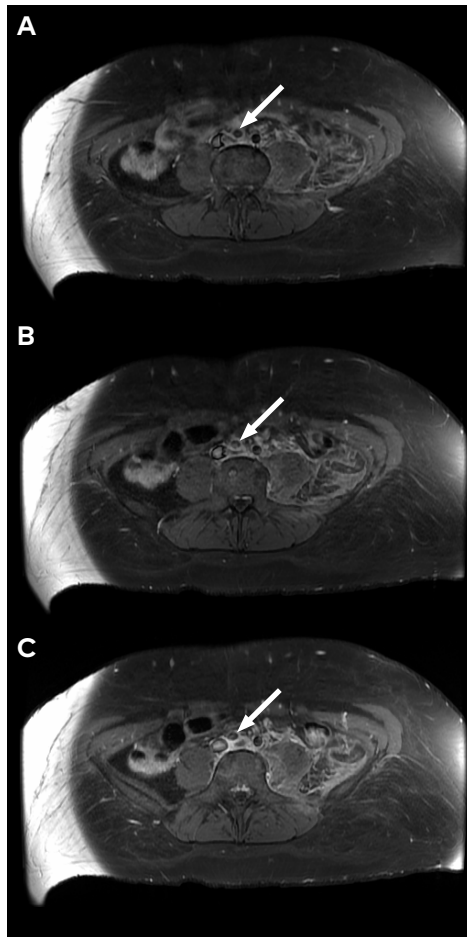


Figure 2. Magnetic resonance images, T1 weighted coronal sections (A-C) show left iliac vein compression by the right iliac artery (arrow) from proximal to distal.

teric artery (SMA) syndrome and nutcracker syndrome.³ The variability of intraabdominal fat distribution is difficult to predict, and visceral fat distribution has been associated with increased mortality independent of total adipose tissue volume.⁶ With the inability to predict which fat stores will be used as someone undergoes rapid weight loss, it is reasonable to extrapolate that this patient's rapid weight loss may have led to the unmasking of MTS, which precipitated a massive proximal DVT. Therefore, a new deep vein thrombosis in a patient after rapid weight loss might prompt evaluation for possible anatomical etiologies, such as MTS, which may significantly alter the course of management.

The American Society of Hematology 2020 guidelines recommend that patients with a DVT are offered home treatment with preference for direct oral-anticoagulation.⁷ Although this patient was initially started on apixaban

and may have been sent home from the emergency room, it was fortunate that this patient's anatomical discovery was made. The key challenge from this case was the lack of initial consideration for MTS, although the history was compatible (200-pound weight loss in a six-month period). Therefore, this patient could have been at risk for long-term morbidity which can be associated with improper treatment since anticoagulation alone is not considered adequate to prevent the long-term sequelae associated with MTS.⁸ Endovascular stenting appears to be safe in the short-term for management of MTS and has been shown to have patency after two years.⁹ However, surgical angioplasty appears to be a more reasonable option for patients who are young and otherwise healthy.^{7,8} The management of MTS has had variable responses, and there is a lack of long-term outcome data which highlights the need for more research regarding the more appropriate interventions for MTS.

Conflicts of Interest

The authors declare they have no conflicts of interest.

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