

Back Pain and Right Leg Swelling: Unusual Presentations of May-Thurner Syndrome

Eleanor Dunlap¹, Suzanna Fitzpatrick¹, Khanjan Nagarsheth²

Review began 03/01/2023

Review ended 03/08/2023

Published 03/10/2023

© Copyright 2023

Dunlap et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

1. Vascular Surgery, University of Maryland Medical Center, Baltimore, USA 2. Vascular Surgery, University of Maryland School of Medicine, Baltimore, USA

Corresponding author: Eleanor Dunlap, edunlap@umm.edu

Abstract

May-Thurner (MT) syndrome refers to compression of the left common iliac vein by the right common iliac artery. Symptoms reported are generally left-sided leg swelling or pain. It is unusual for patients to report right-sided symptoms that are alleviated by treating MT compression. This case series describes three patients who had right-sided symptoms caused by left-sided venous compression. A retrospective chart review identified three patients over a year who presented with a variety of symptoms, including right-leg pain and swelling, and underwent treatment with left-sided venous compressions with a resolution of symptoms. Three patients were identified with right-sided back and flank pain. Venography with intravascular ultrasound (IVUS) showed the MT compression was greater than 75% in each case (mean 80.3% with a range of 75.7%-95%), and all patients were treated by decompressing the venous outflow obstruction by stenting the left common iliac vein, which relieved their symptoms. Venous compressions that occur on the anatomical left side can lead to right-sided symptoms. In patients reporting right-sided back and flank pain, MT should be considered in the differential diagnosis.

Categories: General Surgery, Other, Anatomy

Keywords: may thurner syndrome (mts), may-thurner's syndrome, pain, vascular compression, iliac vein stenosis, venous compression

Introduction

May-Thurner (MT) syndrome was first described in a cohort of patients with left-sided deep vein thromboses (DVT) as a vascular anatomic variant caused by compression of the left common iliac vein by the right common iliac artery [1]. This syndrome is often detected after a person develops symptoms of venous stasis, including left leg swelling, heaviness, pain, venous stasis ulcers, and paresthesias [2]. Not surprisingly, venous stasis caused by MT results in an increased propensity for DVT. Some studies have even described that the higher frequency of left-sided than right-sided DVT may be explained by the prevalence of MT in the population [3]. The symptoms of MT syndrome are mostly reported on the left side due to a direct reduction in the venous outflow from the vessels of the left leg. The few reports of right-sided symptoms secondary to MT usually reference specific variations in vessel anatomy or enlargement of pelvic structures leading to direct compression of right-sided leg veins [4-5].

Herein, we present a case series of three patients who presented with right-sided symptoms that were caused by left-sided iliac vein compressions.

Case Presentation

Methods

A retrospective chart review identified three patients over a one-year period who presented with a variety of symptoms, including right-leg pain and swelling. These patients underwent treatment with left-sided venous compressions, resulting in the resolution of these right-sided symptoms. These charts were reviewed for patient demographic data, symptoms, percent of compression, and treatment. Prior to the start of this project, an Institutional Review Board (HP-00085462) was obtained. Each patient gave informed consent for their de-identified images and clinical information to be used, and careful attention was given to the protection of human rights.

Results

The average age of the patients was 46.5 years (range 34-67 years), and all patients were women. All of the patients had right-sided back and flank pain. Two of the patients had right-leg pain or swelling. One patient reported headaches. In all cases, the percent of venous compression was greater than 75% (mean 80.3% with a range of 75.7%-95%), and all patients were treated by decompressing the venous outflow obstruction by stenting the left iliac vein (Table 1).

How to cite this article

Dunlap E, Fitzpatrick S, Nagarsheth K (March 10, 2023) Back Pain and Right Leg Swelling: Unusual Presentations of May-Thurner Syndrome. Cureus 15(3): e35984. DOI 10.7759/cureus.35984

Patient	Age	History	Symptoms	Percent compression on IVUS	Treatment
1	67	Stroke, hypertension, gastrointestinal reflux	Pain and swelling in the right and left leg	95%	Left common iliac venous stent placement with a 14 mm x 140 mm Cook vena stent
2	62	Hypertension, obesity	Right-sided back pain, pain and swelling in the right leg	76%	Left common iliac venous stent placement with a 14 mm x 140 mm Cook vena stent
3	41	Ehlers-Danlos syndrome, fibromuscular dysplasia, gastroparesis, carotid stenosis	Right-sided back pain, swelling in the left leg, and headache	77.7%	Left common iliac venous stent placement with a 14 mm x 140 mm Cook vena stent

TABLE 1: History of symptoms and treatment

IVUS: intravascular ultrasound

IVUS imaging was used to measure the left iliac vein compression prior to stenting (Figure 1).

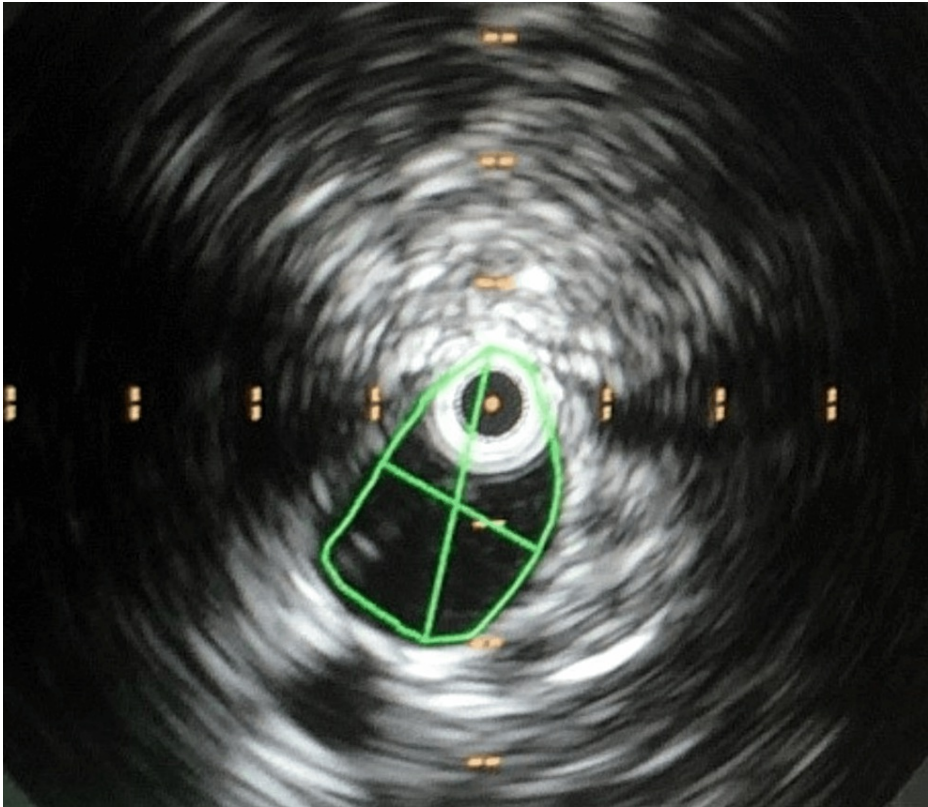


FIGURE 1: IVUS image of left iliac vein compression

After stent placement, a repeat venogram was performed to confirm placement and resolution of venous outflow obstruction (Figure 2).

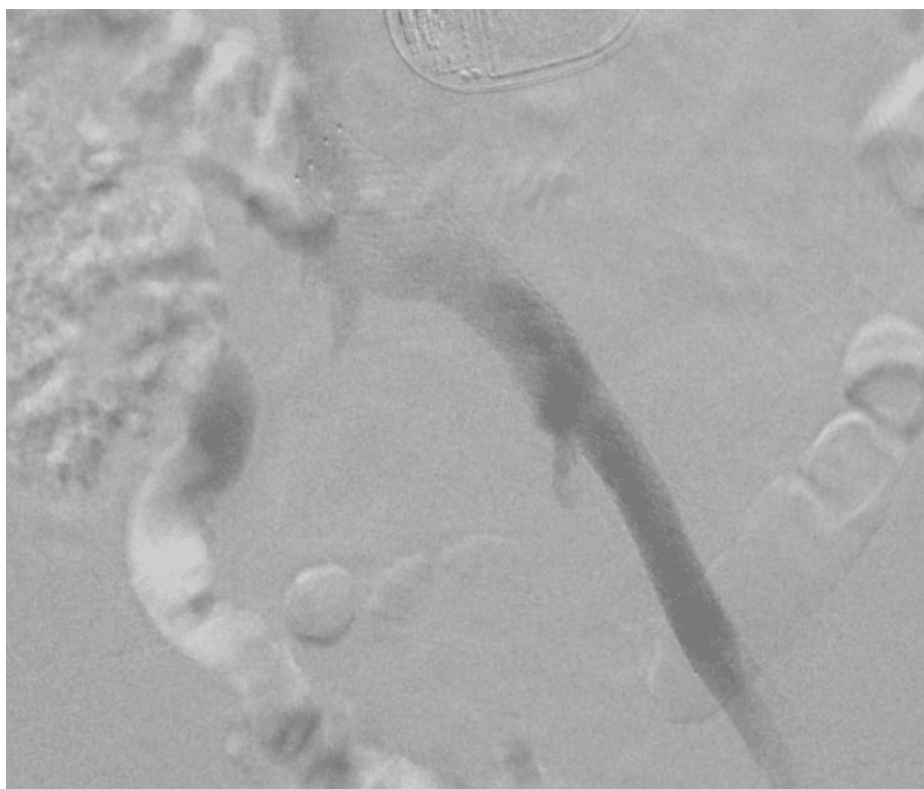


FIGURE 2: Venogram after iliac vein stenting

Discussion

MT syndrome is often diagnosed once venous congestion reaches the level of chronic changes to the tissues or a thrombus develops. Khan et al. describe that MT affects more women than men between the ages of 20 and 50 years. When symptoms are unilateral leg swelling, the differential diagnosis includes, but is not limited to, deep vein thrombosis (DVT), cellulitis, or venous insufficiency [6]. Further imaging is needed to identify venous compression.

Although the exact prevalence of MT is unknown, a recent study found that 31% of patients with iliofemoral DVT had MT [7]. Kibbe et al reported that up to two-thirds of asymptomatic patients had left common iliac vein compression greater than 25% and almost one-fourth had over 50% compression, which indicates that MT anatomy occurs more often than it is reported [8].

The diagnosis of MT syndrome is based on clinician suspicion and diagnostic testing. Computed tomography (CT), magnetic resonance imaging (MRI), or duplex ultrasound can evaluate the central venous system and note if there is extrinsic compression of the vein; however, venography with IVUS is the current gold standard for visualizing the degree of compression of the iliac vein and establishing a diagnosis of MT [9].

In these cases, venous duplex ultrasound was performed first due to leg swelling and pain. Venography with IVUS was performed to assess for right iliac vein compression. Right iliac vein compression, while rare, has been reported in the literature [10]. When no right iliac compression was found, attention was focused on the left iliac vein, and there was compression noted. There are no other reports of left-sided iliac vein compression causing right-sided symptoms in the literature. Treating the compression on the left resolved these patients' pain and swelling on the right, in addition to one patient's chronic headaches.

Conclusions

Venous compressions that occur on the anatomical left side can lead to right-sided symptoms. Advancements in modern diagnostic imaging capabilities through CT scans have led to an increase in the diagnosis of venous compressions. In each of these cases, the treatment of left-sided venous compression alleviated the right-sided symptoms, decreasing pain and swelling, and highlighting the need to consider contralateral venous compressions in differential diagnoses.

Additional Information

Disclosures

Human subjects: Consent was obtained or waived by all participants in this study. University of Maryland Medical Center IRB issued approval HP-00085462. This is to certify that the University of Maryland, Baltimore (UMB) Institutional Review Board (IRB) has reviewed the above-referenced protocol entitled, "Review of Vascular Compression Syndromes: Presentation, Diagnostics, and Management." Your protocol has been determined to be exempt under 45 CFR 46.104(d) from IRB review. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References

1. May R, Thurner J: The cause of the predominantly sinistral occurrence of thrombosis of the pelvic veins . *Angiology*. 1957, 8:419-27. [10.1177/000331975700800505](https://doi.org/10.1177/000331975700800505)
2. Neglén P, Thrasher TL, Raju S: Venous outflow obstruction: an underestimated contributor to chronic venous disease. *J Vasc Surg*. 2003, 38:879-85. [10.1016/s0741-5214\(03\)01020-6](https://doi.org/10.1016/s0741-5214(03)01020-6)
3. Fraser DG, Moody AR, Martel A, Morgan PS: Re-evaluation of iliac compression syndrome using magnetic resonance imaging in patients with acute deep venous thromboses. *J Vasc Surg*. 2004, 40:604-11. [10.1016/j.jvs.2004.07.039](https://doi.org/10.1016/j.jvs.2004.07.039)
4. Burke RM, Rayan SS, Kasirajan K, Chaikof EL, Milner R: Unusual case of right-sided May-Thurner syndrome and review of its management. *Vascular*. 2006, 14:47-50. [10.2310/6670.2006.00012](https://doi.org/10.2310/6670.2006.00012)
5. Rohr A, Maxwell K, Best S, Lemons S, Johnson P: Rare presentation and endovascular treatment of multifocal iliac venous stenoses due to right sided May-Thurner syndrome. *Radiol Case Rep*. 2020, 15:201-3. [10.1016/j.radcr.2019.11.013](https://doi.org/10.1016/j.radcr.2019.11.013)
6. Khan TA, Rudolph KP, Huber TS, Fatima J: May-Thurner syndrome presenting as pelvic congestion syndrome and vulvar varicosities in a nonpregnant adolescent. *J Vasc Surg Cases Innov Tech*. 2019, 5:252-4. [10.1016/j.jvscit.2019.02.008](https://doi.org/10.1016/j.jvscit.2019.02.008)
7. Heller T, Teichert C, Hafer J, Weber MA, Kröger JC, Meinel FG: Prevalence of May-Thurner syndrome in patients with deep vein thrombosis at a large medical referral center. *Rofo*. 2019, 191:1107-17. [10.1055/a-0959-6230](https://doi.org/10.1055/a-0959-6230)
8. Kibbe MR, Ujiki M, Goodwin AL, Eskandari M, Yao J, Matsumura J: Iliac vein compression in an asymptomatic patient population. *J Vasc Surg*. 2004, 39:937-43. [10.1016/j.jvs.2003.12.032](https://doi.org/10.1016/j.jvs.2003.12.032)
9. Knuttinen MG, Naidu S, Oklu R, Kriegshauser S, Eversman W, Rotellini L, Thorpe PE: May-Thurner: diagnosis and endovascular management. *Cardiovasc Diagn Ther*. 2017, 7:S159-64. [10.21037/cdt.2017.10.14](https://doi.org/10.21037/cdt.2017.10.14)
10. Nasif A, Ahmed AM, Al-Embideen S, Nazzal M, Osman M, Ahmed A: Unusual presentation of right-sided May-Thurner syndrome. *J Vasc Surg Cases Innov Tech*. 2021, 7:768-71. [10.1016/j.jvscit.2021.10.005](https://doi.org/10.1016/j.jvscit.2021.10.005)