

Unusual presentation of right-sided May-Thurner syndrome

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ABSTRACT

May-Thurner syndrome commonly presents with left leg swelling. Right-sided venous compression syndromes are rare. We report a 49-year-old gentleman who presented with right lower extremity swelling after leg trauma. He was found to have right distal common iliac vein compression by the overlying right internal iliac artery. He was treated with an endovascular approach with balloon venoplasty and stenting. This is a unique presentation of May-Thurner syndrome variation affecting the right lower extremity with limited description in the literature. (*J Vasc Surg Cases Innov Tech* 2021;7:768-71.)

Keywords: May-Thurner syndrome; Right-sided

May-Thurner syndrome (MTS) is a phenomenon commonly described as an acquired stenosis of the left common iliac vein secondary to compression by the right common iliac artery. Right-sided MTS is a rare phenomenon. It has been reported in a patient with left-sided inferior vena cava¹ and in patients with a high aortic bifurcation.² Given the rare presentation of this condition, diagnosis is commonly missed and management strategies are less defined compared with classic MTS. We report a case of right-sided MTS variation caused by compression of the right common iliac vein that was treated with an endovascular approach with significant improvement of the patient's symptoms. Consent for publication was obtained from the patient.

CASE PRESENTATION

Our patient is a 49-year-old gentleman who is a former smoker. He was injured by a metal object on his right shin. After the trauma, he developed right leg swelling and redness. Initially, the patient was seen in a different hospital and was treated for cellulitis with antibiotics for 2 weeks with no improvement. An ultrasound scan for the lower extremity was negative for deep vein thrombosis (DVT). After 2 months of persistent leg swelling, despite using a thigh high compression stocking (20-30 mm Hg), he was referred to our office for further care. He presented with right lower extremity swelling that

involved the entire lower extremity up to the groin. The swelling worsened toward the end of the day. He still used thigh high compression stockings regularly with no significant improvement and denied rest pain or tissue loss. On physical examination, there was +2 right lower extremity swelling, with palpable pedal pulses. There was no evidence of swelling of the left lower extremity. His venous reflux study showed clinically significant reflux (common femoral vein 1900 ms/great saphenous vein at the saphenofemoral junction 944 ms) with no evidence of reflux involving the rest of his right great saphenous vein. Computerized tomography venogram (CTV) was sub-optimal demonstrating some collateral veins but no evidence of central venous thrombosis. However, it did show compression of the right common iliac vein (Fig 1). After a discussion with the patient, we decided to obtain a venogram with intravascular ultrasound (IVUS) and, depending on findings, possible iliac vein stenting.

We accessed the right common femoral vein under ultrasound guidance. Central venogram and IVUS demonstrated a >50% reduction in diameter confirming the compression of the right common iliac vein (Figs 2 and 3). Predilation of the vein with an 8 × 100 mm balloon was followed by dilation with a 16 × 40 mm balloon before placing a 16 × 120 mm ViCi Venous Stent (self-expanding nitinol stent). The stent was ballooned, and the venography showed the improved diameter of the common iliac vein. Completion venogram and IVUS showed resolution of the stenosis (Figs 2 and 3). Postoperatively, the patient was discharged on anticoagulant (apixaban) and antiplatelet therapy (aspirin) for 3 months and then switched to antiplatelet therapy only with continued use of a compression stocking. He was seen in the office 1 month postoperatively. He had complete resolution of the leg swelling. Duplex ultrasound at the time showed a patent iliac vein stent. In our institute, the postprocedure follow-up routine for patients with iliac venous stenting is 1, 6, 12, and 18 months and then yearly duplex ultrasound after that. On 1-year follow-up, the patient denied any symptoms affecting his right lower extremity and duplex ultrasound showed a patent right iliac vein stent.

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Fig 1. Computed tomography (CT) scan demonstrating the right common iliac vein compression.

DISCUSSION

Venous outflow obstruction presenting in young adults was not well understood until 1957 when Dr Robert May and Dr Joseph Thurner concluded in their study of 430 cadavers that thrombosis of the pelvic veins occurs approximately eight times more frequently on the left side than on the right side of the pelvis. They attributed this to spur-like formations in the left common iliac vein and described three types of these formations. The first protrudes into the lumen like a pier or pillar, the second divides the lumen completely, and the third obstructs it almost entirely. On the basis of their histologic data, they reported that those formations are not of a

congenital origin but develop during the patient's lifetime.³

The majority of patients with venous compression are asymptomatic, but those who are symptomatic can present in both acute and chronic settings. Extensive ipsilateral DVT can develop secondary to compression of the left common iliac vein. It can also present with pain, swelling, venous ulcers, and skin discoloration.⁴ Some patients may even develop postthrombotic syndrome that was reported by Cockett et al in 1965.⁵

Our patient presented with right lower extremity swelling after trauma that was diagnosed initially by his primary physician as cellulitis. However, the swelling persisted despite a full course of antibiotics. Workup for DVT was negative. Given the rarity of right-sided MTS and the unusual presentation, the proper diagnosis was delayed for his condition with a resulting delay in the delivery of the correct treatment. Other rare cases of right-sided iliac vein compression have been reported such as MTS secondary to prostate enlargement,⁶ lumbosacral exostosis,⁷ or compression of the right iliac vein between the right internal and external iliac arteries.⁸

Although the exact prevalence of MTS remains unknown, multiple studies estimated an asymptomatic anatomical variant within the general population at 22%-32%.^{3,9,10} Furthermore, 31% of patients with iliofemoral DVT at a large medical center in Germany were found to have MTS.¹¹ Women are at higher risk of developing symptomatic MTS¹² especially with multiple pregnancies,¹³ in the postpartum period,¹⁴ or if they are on contraceptive pills.¹⁵ Additional risk factors include

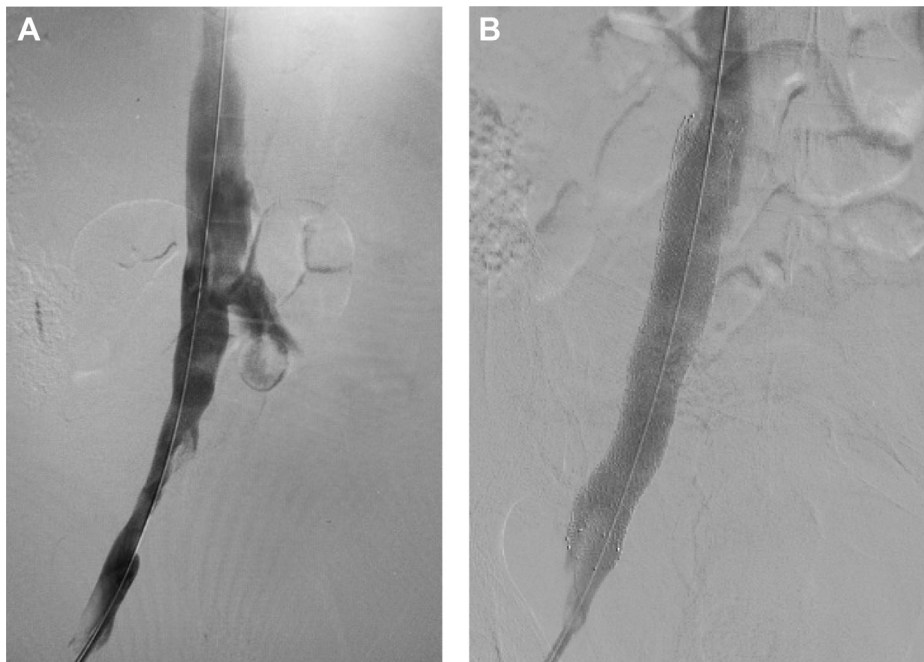


Fig 2. (A) Initial venogram showing stenosis of the right common iliac vein. (B) Completion venogram showing the patent right common iliac vein.

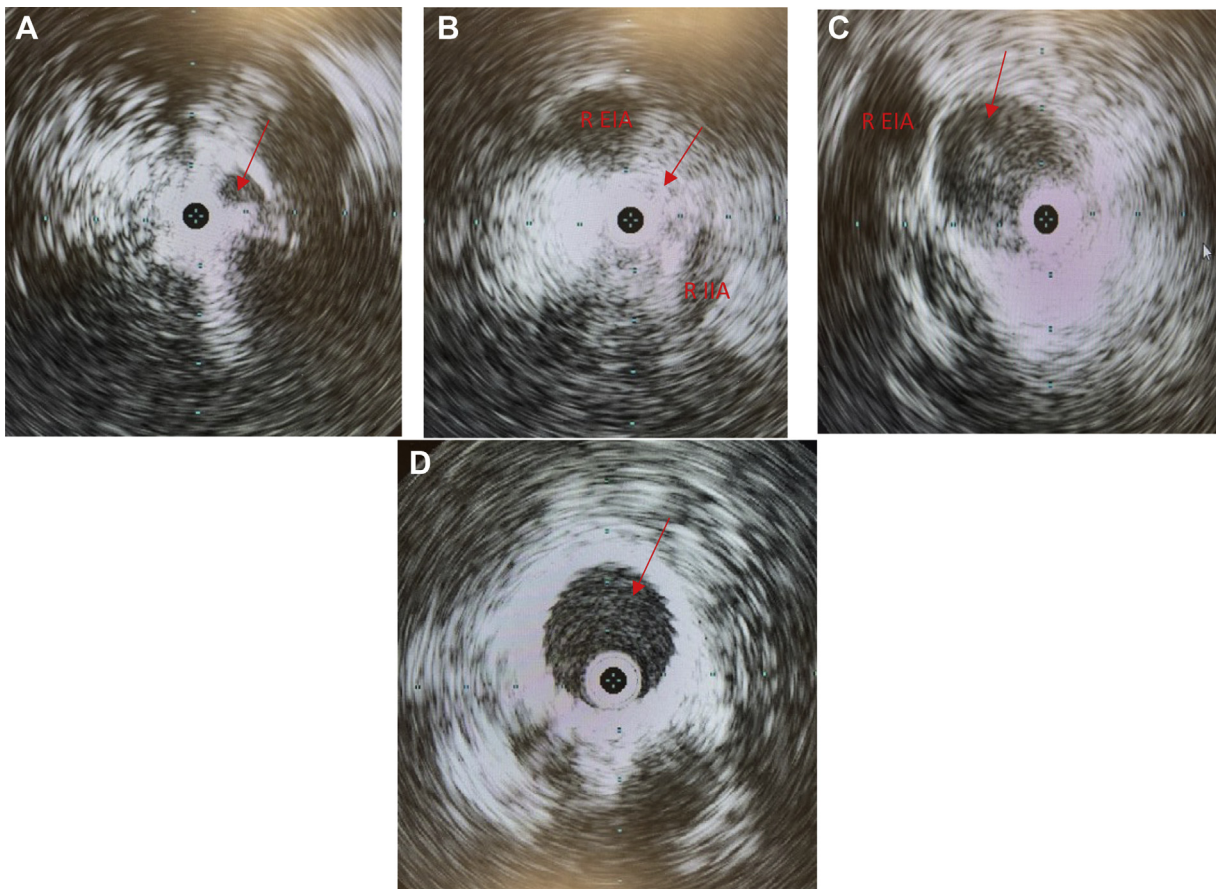


Fig 3. Intravascular ultrasound (IVUS) images: **(A)** preintervention compressed lumen of the right common iliac vein; **(B)** totally compressed distal right common iliac proximal external iliac veins; **(C)** normal caliber of the right external iliac vein; **(D)** poststenting of the iliac vein. *R EIA*, Right external iliac artery; *R IIA*, right internal iliac artery.

prolonged immobilization, scoliosis,¹⁶ and history of recurrent DVT.¹⁷ It is therefore recommended that physicians and medical providers include MTS in their differential diagnosis especially in younger patients who present with symptoms of lower venous disease. Although right-sided MTS variants have been described previously,¹⁸ the unusual presentation of our patient after trauma rather than the usual presentation of swelling and/or DVT is what makes it a unique addition to the current literature. Our patient had no history of DVT or venous disease and was not responsive to conservative therapy, but he had a variant of MTS that was probably asymptomatic for years until his recent injury. We believe that the swelling only started after the trauma due to the inflammation associated with trauma; that increased the blood flow to and from the leg, which in the setting of outflow stenosis could result in lower extremity swelling.

The diagnosis of MTS is usually based on high suspicion and diagnostic testing. MTS should be suspected in patients with unprovoked DVT or unilateral lower extremity swelling with unremarkable workup including DVT ultrasound study and venous reflux testing. CTV and

magnetic resonance venography (MRV) are important to evaluate the central venous system for any stenosis or external compression. However, venography with IVUS is currently the gold standard for visualizing the compression of the iliac vein and establishing a diagnosis of MTS. CTV/MRV can be used but have some practical limitations. CTV is unable to control for the volume status of the patient during scanning,¹⁹ unless strict protocols are followed. MRV is an expensive option to diagnose MTS; however, it can be of value in patients with contraindication to CT scans. Furthermore, transabdominal ultrasound study is a valuable noninvasive tool to evaluate the venous system, but it is limited by patient body habitus, fasting status, and more importantly being operator dependent.

Treatment of MTS depends on the presentation, severity of symptoms, and whether the patient has developed DVT. Conservative treatment such as compression stockings can be used for patients who are asymptomatic or have mild symptoms. For patients with moderate symptoms or DVT, endovascular treatment with stenting is recommended.

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