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Beyond May-Thurner: When CTA Uncovers a Triple Venous Compression

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Abstract | **Case Report**

May-Thurner Syndrome (MTS) is an anatomical condition characterized by the compression of the left common iliac vein by the right common iliac artery, often leading to venous thrombosis. It is underdiagnosed, with most cases presenting in females between 20–40 years. We present the case of a 68-year-old female with Sharp syndrome, a known connective tissue disease, who presented with unilateral lower limb discomfort. Imaging via computed tomography angiography (CTA) revealed compression of the left common iliac vein, alongside Nutcracker Syndrome and pelvic venous congestion. Given the absence of thrombosis and stable symptoms, the patient was treated conservatively with analgesics and venotonic agents. This case highlights the importance of CTA in diagnosing MTS and related syndromes, especially in complex cases with overlapping vascular anomalies.

Keywords: May-Thurner syndrome, CTA, Nutcracker syndrome, pelvic congestion syndrome, venous compression.

INTRODUCTION

May-Thurner syndrome (MTS), also known as Cockett syndrome, is an underdiagnosed anatomical variant characterized by compression of the left common iliac vein between the overlying right common iliac artery and the fifth lumbar vertebra. This chronic compression predisposes to venous stasis, venous spur formation, and eventually deep vein thrombosis (DVT), especially on the left side. While MTS typically affects younger individuals, it can also be unmasked in older patients or those with additional risk factors for venous thromboembolism [1,2].

Another vascular compression syndrome, the anterior nutcracker syndrome, refers to the compression of the left renal vein between the abdominal aorta and the superior mesenteric artery, potentially leading to hematuria, flank pain, or pelvic congestion [3].

In connective tissue diseases such as mixed connective tissue disease (Sharp syndrome), vascular involvement and hypercoagulability may contribute to thrombosis and worsen venous compression. [4]

We report a case who presented with unilateral lower limb discomfort. Imaging by computed tomography angiography (CTA) revealed compression of the left iliac vein consistent with May-Thurner syndrome, along with compression of the left renal vein suggestive of anterior nutcracker syndrome, emphasizing the crucial role of imaging in identifying vascular compressive anomalies.

CASE PRESENTATION

We report the case of a 68-year-old woman with a 10-year history of Sharp syndrome, treated with hydroxychloroquine, who presented with unilateral lower limb discomfort and a significant weight loss of 10 kg over the past few months. The patient's symptoms included persistent pain and a sensation of heaviness in the left lower limb, without any history of recent trauma or known vascular events.

Upon clinical examination, the patient had no overt signs of deep venous thrombosis or significant neurological deficits. However, her longstanding history of autoimmune disease and medication usage raised suspicion of underlying vascular abnormalities, prompting further imaging.

Computed tomography angiography (CTA) revealed multiple vascular anomalies:

Compression of the left renal vein in its aortomesenteric segment, between the abdominal aorta and the superior mesenteric artery, creating a narrowed aortomesenteric

angle of 10°, consistent with anterior Nutcracker syndrome. This compression led to upstream dilatation of the left renal vein and the left ovarian vein. (Figure 1)

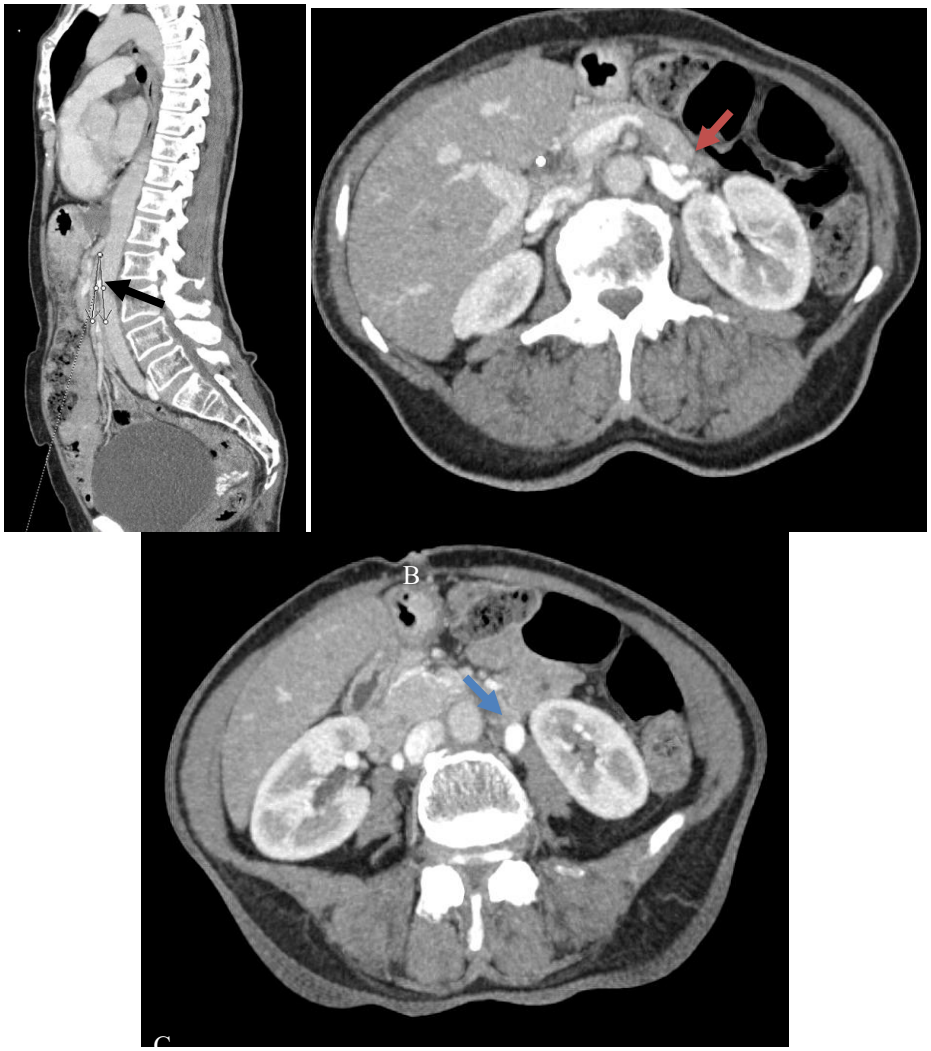

Figure 1: Sagittal (A) and axial (B, C) contrast-enhanced CT scans showing aortomesenteric compression with a narrowed aortomesenteric angle measured at 10° (A; Black arrow), dilatation of the left renal vein (B; Orrange arrow), and dilatation of the left ovarian vein (C; Blue arrow)

Pelvic varices, including uterine-ovarian and para-uterine varices, were noted on the left side, indicative of pelvic venous congestion. (Figure 2)

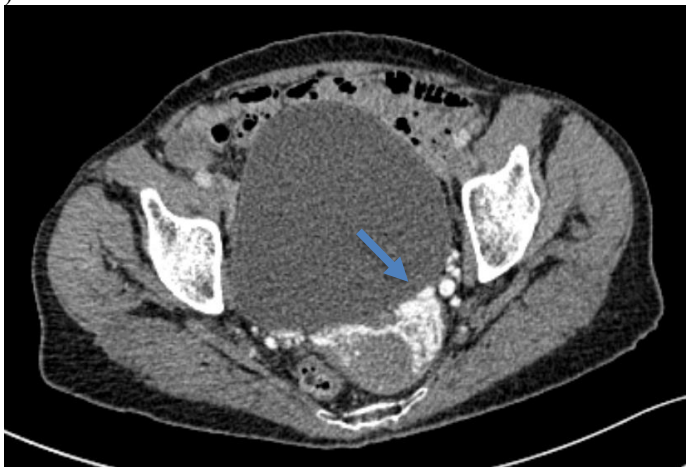

Figure 2: Axial contrast-enhanced CT scan showing pelvic varices on the left side, including uterine-ovarian and para-uterine varices

Additionally, the left common iliac vein was found compressed between the right common iliac artery and the L5 vertebral body, with mild upstream dilatation, suggestive of May-Thurner syndrome (Cockett syndrome). (Figure 3)

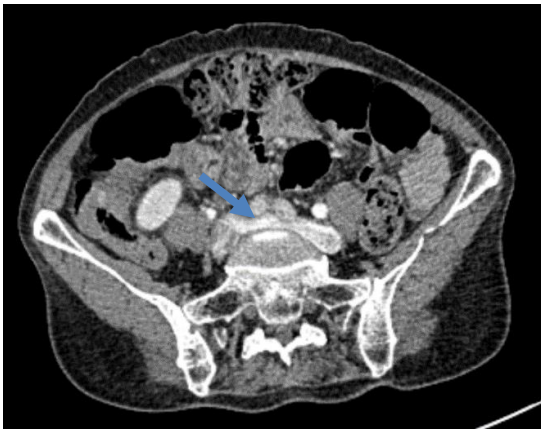

Figure 3: Axial contrast-enhanced CT scan showing compression of the left common iliac vein between the right common iliac artery and L5 vertebral body (Blue arrow), with mild upstream dilatation

Despite these findings, no signs of acute deep venous thrombosis were observed on CTA.

Given the absence of thrombosis and the chronic nature of her symptoms, the patient was managed conservatively. Treatment included analgesics, venotonic agents, and recommendations for compressive stockings. Regular clinical and imaging follow-up was advised to monitor for any progression or complications, with vascular intervention considered only in case of worsening symptoms or thrombotic events.

DISCUSSION

May-Thurner Syndrome (MTS), also known as iliac vein compression syndrome, is characterized by the compression of the left common iliac vein by the overlying right common iliac artery. The true incidence of MTS remains unknown but has been estimated to range from 22% to 32% in early 20th-century autopsy studies [5 ;6]. Despite its high anatomical prevalence, the clinical prevalence of MTS-related deep vein thrombosis (DVT) is low, accounting for only 2%–3% of all lower extremity DVTs [7], and is typically observed in females between 20 and 40 years of age.

The pathophysiology of MTS is thought to involve chronic mechanical trauma from arterial pulsations, leading to deposition of elastin and collagen in the left common iliac vein [8] formation of venous spurs, and ultimately extensive intimal proliferation. This progressive damage may result in venous thrombosis and impaired venous return [9]. Numerous anatomical variants of MTS have also been described [10,11].

Patients with MTS often present with unilateral left lower extremity swelling and pain, either in acute or chronic forms. Some may develop skin hyperpigmentation, chronic leg discomfort, varicose veins, or recurrent skin ulcers. [9] Rarely, iliac vein rupture has been reported as a complication. [12] When DVT is diagnosed in young individuals, a thorough clinical history, physical examination, and a complete diagnostic workup, including a thrombophilia panel, are warranted to uncover underlying risk factors. Kolbel et al. found that 67% of patients with chronic iliac vein occlusion or MTS had a form of thrombophilia.[13] In our case, however, the patient exhibited the classic form of MTS without any evidence of thrombophilia.

Our patient's clinical presentation was marked by chronic unilateral leg discomfort, absence of acute DVT, and a history of autoimmune disease. This constellation of findings prompted further imaging, which revealed compression of the left common iliac vein, the left renal vein, and associated pelvic venous varicosities. These findings were suggestive of a multifactorial venous outflow obstruction, involving a combination of May-Thurner Syndrome (MTS), Nutcracker Syndrome (NCS), and Pelvic Congestion Syndrome (PCS).

Nutcracker syndrome is characterized by compression of the left renal vein between the aorta and superior mesenteric artery. It is often associated with flank pain, hematuria, and pelvic varices. On the other hand, pelvic congestion syndrome—commonly seen in multiparous women—results from ovarian vein insufficiency and manifests as chronic pelvic pain, heaviness, or pressure. Due to the non-specificity of symptoms, PCS is frequently underdiagnosed. [3]

In our case, computed tomography angiography (CTA) played a crucial role in revealing these overlapping vascular compressions. This highlights the importance of cross-sectional imaging in evaluating

patients with unexplained chronic lower extremity symptoms, particularly when Doppler ultrasound is inconclusive for deep pelvic or iliocaval abnormalities. CT venography, MR venography, intravenous ultrasound (IVUS), or conventional venography remain the definitive modalities for diagnosing MTS. However, standard Doppler ultrasound often fails to visualize iliac vessels adequately, although a few reports have suggested that indirect signs can sometimes raise suspicion of MTS [14, 8].

Treatment of MTS is indicated only in symptomatic cases. While open surgical interventions were used in the past, minimally invasive endovascular techniques have now become the preferred approach. The cornerstone of management includes pharmacomechanical thrombolysis and mechanical thrombectomy to eliminate thrombotic burden and reduce the risk of post-thrombotic syndrome, followed by correction of the anatomical defect using balloon venoplasty and stent placement. Post-procedural anticoagulation is recommended for at least six months to prevent in-stent restenosis. (15) In patients with a large thrombus burden, inferior vena cava (IVC) filter placement may be considered. (16) Kwak et al. reported that metallic stent placement after thrombectomy resulted in a primary patency rate of 95% and a secondary patency rate of 100% at two-year follow-up. [17]

CONCLUSION

May-Thurner Syndrome (MTS) remains an underdiagnosed cause of chronic unilateral lower limb symptoms, particularly in young females. In our case, CTA was instrumental in revealing multiple venous compressions, including MTS, Nutcracker Syndrome, and Pelvic Congestion Syndrome. Given the absence of thrombosis and the patient's stable condition, a conservative approach was adopted. This highlights the importance of considering MTS and associated syndromes in the differential diagnosis and of using cross-sectional imaging like CTA for comprehensive vascular assessment.

Conflicts of Interest: The authors declare no conflicts of interest.

Contributions of the Authors: All authors contributed to the conduct of this work. They have read and approved the final version of the manuscript.

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