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MAY-THURNER SYNDROME: UNMASKING A RARE BUT SIGNIFICANT CAUSE OF VTE

Vascular Surgery

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ABSTRACT

May-Thurner syndrome (MTS) is characterized by extrinsic venous compression of the left common iliac vein by the right common iliac artery, leading to venous outflow obstruction and increased risk of deep vein thrombosis (DVT). This underdiagnosed condition accounts for 2% to 5% of all DVT cases and can result in significant complications such as recurrent DVT and chronic venous insufficiency if not identified and treated early. We present a case of a 25-year-old male with a history of recurrent DVT who developed acute left leg swelling and fever. Imaging confirmed MTS, prompting endovascular intervention including embolectomy, venoplasty, and stenting. Post-operative management included anticoagulation and antibiotics, leading to a successful recovery. This case underscores the importance of recognizing MTS as a potential cause of DVT, particularly in young patients, and highlights the need for further epidemiological studies to better understand its prevalence and management.

KEYWORDS

May-Thurner syndrome (MTS), Recurrent DVT, Left common iliac venoplasty, Stenting, Anticoagulation therapy.

INTRODUCTION

Extrinsic venous compression by the arterial system against bony structures is referred to as May-Thurner syndrome (MTS). The compressions bring about a localized focal stenosis or "spur" of the left common iliac vein at the level of the crossover position of the right common iliac artery, followed by venous outflow obstruction/stenosis and venous hypertension in the ipsilateral limb [1]. This underdiagnosed cause of iliofemoral deep vein thrombosis, which accounts for 2% to 5% of all deep vein thromboses, is also known as iliac vein compression syndrome, Cockett syndrome, or ilio-caval compression syndrome [2,3] . According to autopsy studies, the incidence of MTS varies between 22 to 32%; however, the precise percentage is unknown [4] . Recurrent DVT, post-thrombotic syndrome, and chronic venous insufficiency comprise some of the complications that can be avoided with early diagnosis and treatment. Anticoagulation, thrombolysis, and endovascular procedures involving angioplasty and stenting are the management techniques [1]. We describe a case report of a 25-year-old male diagnosed with recurrent (DVT), eventually confirmed to have MTS.

CASE PRESENTATION

A 25-year-old male presented to endovascular surgery department with 8-day history of left leg swelling and low-grade fever and complained of acute worsening of left leg swelling which has been painful for 3 days. He is a known case of recurrent Deep Vein Thrombosis [DVT] for past one year and on anticoagulant medication Rivaroxaban 20milligram in the past 7 months. He had no other co-morbidities and had no relevant family history but was a chain smoker, no alcohol, and illicit drugs. On examination he was conscious and oriented, febrile, with tender erythematous swelling from left ankle to thigh. Systemic examination did not reveal any significant findings. Complete blood picture revealed leucocytosis. Electrolytes, renal and liver functions were within normal limits. Electrocardiogram showed sinus tachycardia and 2D-Echo was normal. However, his D-dimer was elevated. Left lower limb venous Doppler showed thrombosis of left common femoral vein. CT venogram of abdomen and lower limb [5] was done which showed gross compression of distal left common iliac vein by right common iliac artery and these features were consistent with MTS. Patient underwent embolectomy followed by left common iliac venoplasty + stenting [6]. Access was gained through the left common femoral vein (CFV) under ultrasound guidance. Angiography revealed significant narrowing of the left CIV with development of collateral vessels. The stenotic lesion was crossed with a guidewire and catheter, followed by predilation using a 12*40mm angioplasty balloon. Subsequently, a 12*100mm stent was deployed to maintain vessel patency. Post-stenting angiography confirmed proper stent placement and restoration of distal blood flow. The guidewire, catheter, and vascular access sheaths were then removed, completing the procedure. The post-operative period was eventful and patient was clinically and symptomatically better. Medical management was done with antibiotics like third-generation cephalosporins for prophylaxis, followed by fluoroquinolones to prevent bloodstream infections from enteric Gram-negative bacteria due to left CFV access. Anticoagulation therapy with heparin, followed by long-term rivaroxaban, was prescribed alongside antiplatelet aspirin for the management of MTS. Follow up after one week was advised with multi-vitamins and antioxidants as discharge medications.

DISCUSSION

Majority of MTS cases involve external compression of the left common iliac veins, but rarely right common iliac vein compression presenting as chronic worsening asymmetric right greater than left lower extremity edema were also reported. Stenting of the right common iliac vein showed significant symptomatic improvement in such patients [7]

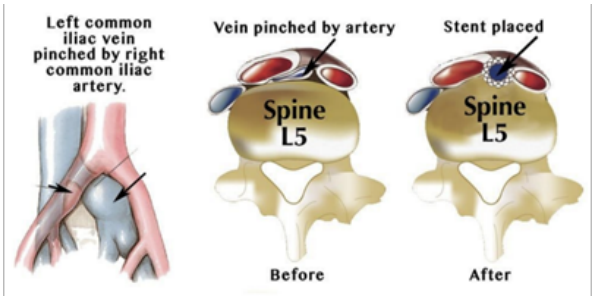

Fig 1: MTS and its Surgical Management [8]

The true incidence, particularly among specific populations such as India, remains unknown, highlighting the critical need for additional epidemiological research. [9] When children, adolescents, or young adults present with (left-sided) iliac thrombosis and/or pulmonary embolism, it is important to obtain a detailed family history, as May-Thurner syndrome might have a hereditary basis. MTS is more common in women, at least twice as frequent as in men, and risk factors for venous thromboembolism in MTS patients include a history of cancer, immobilization, hypercoagulable disorders, and oral contraceptive pills. Men experience more leg pain and swelling, whereas women are younger and more likely to present with a pulmonary embolus. The patient we described is young male presented with VTE secondary to left iliac vein thrombosis, with radiological findings consistent with classical MTS. Despite being on long-term anticoagulation, he developed recurrent DVT with acute worsening of left leg swelling and fever. Imaging confirmed significant compression of the left common iliac vein by the right common iliac artery, and he underwent embolectomy followed by left common iliac venoplasty and stenting. Post-procedure angiography confirmed successful stent placement with restored blood flow. Medical management included third-generation cephalosporins for prophylaxis, fluoroquinolones for enteric Gram-negative coverage, and anticoagulation with heparin followed by rivaroxaban and aspirin. The patient recovered well post-operatively and was discharged on supportive therapy, with a

scheduled follow-up. The congenital form, arising from an abnormality in embryonic development, is even more uncommon. Congenital reduction of iliac-vertebral space is usually the cause of left common iliac vein thrombosis [10, 11, 12] . While a large number of MTS patients are asymptomatic, some exhibit symptoms of DVT in the left lower extremities, including ulcerations, varicose veins, venous claudication, swelling, and pain. The development of a venous spur, asymptomatic left CIV compression, and left lower extremity DVT are the three clinical stages of MTS. Upon physical examination, patients may exhibit venous ulcerations, telangiectasias, hyperpigmentation, or swelling. But patients tend to adapt to these slow changes and continue to go undiagnosed. A thorough clinical diagnostic evaluation is therefore recommended.[5] MTS may result in pulmonary emboli, seizures, and hypoxia (complications of massive pulmonary emboli), chronic venous stasis; 28% of patients with iliac vein rupture have MTS. It may also cause DVT to recur. There have been reports of May-Thurner syndrome complicating kidney transplantation from a deceased donor in the left lower quadrant in adult polycystic kidney disease and asymptomatic MTS occurring when other risk factors, such as coagulation disorders, a history of vertebral surgery, and additional pressure on the graft, coincide and lead to graft failure. [13,14,15,16] The most common diagnostic modality for MTS is ultrasound (US)/color Doppler. Contrast-enhanced computed tomography (CT) and CT venography (CTV) are more sensitive and specific methods for detecting iliac venous compression of up to 95%. Magnetic resonance venography (MRV) is an alternative modality for diagnosing MTS that shows evidence of iliac vein compression. Venography with intravascular ultrasound (IVUS) is the gold standard for diagnosing MTS. Pelvic malignancy, retroperitoneal lymphadenopathy, pregnancy, aneurysms of the pelvic iliac arteries, bony outgrowth or deformities, and retroperitoneal fibrosis are all potential causes of iliac vein compression. [17]. All MTS patients with acute DVT should begin anticoagulation immediately. An intravenous infusion of unfractionated heparin is the recommended initial anticoagulant [2]. MTS-related DVT patients who received a metallic stent after thrombectomy had a primary and secondary patency rate of 95% and 100%, respectively, at a 2-year follow-up. [18]

Key Learning Points for Healthcare Professionals

1. **Early Recognition is Crucial:** Maintain a high index of suspicion for May-Thurner Syndrome (MTS) in young patients with unexplained left lower extremity DVT to prevent complications.
2. **Utilizing Advanced Imaging:** While duplex ultrasound is a good screening tool, CTV, MRV, and IVUS are essential for accurate diagnosis and treatment planning.
3. **Comprehensive Management Approach:** MTS treatment requires anticoagulation and often endovascular intervention to address both thrombosis and vein compression.

CONCLUSION

This case report highlights the importance of recognizing underdiagnosed vascular conditions like MTS and their potential complications. With the increasing prevalence of sedentary lifestyles, particularly among young IT professionals who sit for prolonged hours, the risk of developing deep vein thrombosis (DVT) due to conditions like MTS cannot be ignored. Since no large-scale epidemiological studies have clearly established this risk, further research is needed. Healthcare professionals must emphasize preventive strategies, including regular movement, hydration, and ergonomic work habits, to mitigate the chances of DVT and related syndromes.

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