

Compounded Challenges in Managing May-Thurner Syndrome with Concurrent Severe Obesity: A Case Study on Complex Deep Vein Thrombosis in a Young Male

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ABSTRACT

Background: May-Thurner Syndrome (MTS) is a rare vascular disorder resulting from compression of the left common iliac vein by the overlying right common iliac artery. This anatomical variant predisposes patients to deep vein thrombosis (DVT), most commonly affecting the left lower extremity. Early recognition is crucial, as undiagnosed MTS can lead to recurrent thrombosis and long-term venous complications.

Case Presentation: We report a case of a 20-year-old male with severe obesity (body weight 145 kg) who presented with acute pain and swelling of the left lower limb. Duplex ultrasound revealed extensive thrombosis of the left lower extremity veins. Computed tomography (CT) venography demonstrated compression of the left common iliac vein by the right common iliac artery, confirming the diagnosis of MTS.

Management and Outcome: The patient was managed with anticoagulation therapy to treat the acute thrombotic event. A multidisciplinary team involving vascular medicine and interventional radiology evaluated options for addressing the underlying venous compression. The patient showed clinical improvement with symptom resolution and no evidence of recurrent thrombosis on follow-up.

Conclusion: This case highlights the importance of considering MTS in young patients presenting with unexplained left-sided DVT, particularly in the presence of risk factors such as obesity. Timely diagnosis through appropriate imaging and multidisciplinary management can prevent serious complications and improve long-term outcomes..

KEYWORDS: May-Thurner Syndrome; Deep Vein Thrombosis; Iliac Vein Compression; Obesity; Venous Thromboembolism; Case Report.

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INTRODUCTION

May-Thurner Syndrome (MTS), often referred to as iliac vein compression syndrome, is a medical disorder marked by the compression of the left common iliac vein by the right common iliac artery. This anatomical deviation can result in venous stagnation and consequently elevate the susceptibility to deep vein thrombosis (DVT) in the left lower limb [1]. Lower limb deep vein thrombosis (DVT) caused by MTS is often overlooked, especially in young and otherwise healthy people. The disease was initially documented by May and Thurner in 1957, who observed a common anatomical variant where the right common iliac artery compresses the left common iliac vein against the lumbar spine [2]. The process of compression can result in the formation of intravascular spurs, which in turn contribute to the obstruction of veins and the formation of blood clots [3]. Determining the prevalence of MTS is difficult because it often does not cause any symptoms in most people and there are no defined criteria for diagnosis. Nevertheless, the condition is predominantly identified in women, namely in the age group of 20 to 40 [4]. However, MTS can impact persons of all genders and ages, including young guys, although it is less frequent. Obesity is a well-known factor that increases the risk of venous thromboembolism (VTE) and can worsen the risk of deep vein thrombosis (DVT) in patients with MTS. This is because obesity leads to higher venous pressure and decreased blood flow [5]. The correlation between obesity and MTS is especially alarming due to the increasing prevalence of obesity globally. This underscores the necessity for heightened awareness and timely identification of this syndrome in populations at risk [6]. The clinical manifestation of MTS can range from being without symptoms to severe cases of deep vein thrombosis (DVT), characterized by symptoms such as edema, discomfort, and discolouration in the leg. The diagnosis is typically established using imaging techniques, such as duplex ultrasonography, computed tomography (CT) venography, or magnetic resonance (MR) venography. These methods can effectively reveal the anatomical compression and the presence of thrombosis [7]. Possible treatments for MTS including anticoagulant therapy, thrombolysis, and, in certain instances, surgical surgery to alleviate venous compression and avert future occurrences [8]. Healthcare providers must possess a comprehensive understanding of the etiology, risk factors, and clinical implications of MTS in order to accurately diagnose and effectively manage this disorder. This is particularly crucial in populations that may not exhibit the usual risk indicators, such as young boys with extreme obesity, where the diagnosis of MTS may not be promptly addressed.

CASE PRESENTATION:

Patient Information: A 20-year-old guy with a notable medical history of morbid obesity (weighing 145 kg) arrived at the hospital with sudden start of pain, swelling, and numbness in the left lower limb, which has been persistent for seven days. **Clinical Findings:** The patient's condition was moderately severe yet stable during assessment. Significant observations revealed a marginally lower temperature in the left foot in comparison to the right, the absence of pulse in the femoral, popliteal, and pedal arteries in the left leg, and the inability to detect lymph nodes through palpation. The right lower limb displayed elevated temperature with satisfactory capillary refill, while the pulse of the posterior tibial artery was not identified. The patient's vital signs indicated a pulse rate of 80 beats per minute and a blood pressure reading of 130/80 mmHg. The heart sounds were attenuated yet regular. The patient had unimpaired active and passive movements in both lower limbs, and their oxygen saturation (SpO₂) was measured at 98%. **Diagnostic Assessment:** The initial laboratory tests revealed a high D-dimer level of 1380, indicating an elevated risk of blood clot formation, an increased erythrocyte sedimentation rate (ESR) of 53 mm/hour suggesting inflammation, and a prolonged partial thromboplastin time (PTT) of 42 seconds. The levels of liver enzymes were increased, with alanine aminotransferase (ALT/GPT) measuring 112 U/L and aspartate aminotransferase (AST/GOT) being 78.2 U/L. A CT scan revealed a blockage in the left common iliac artery. The duplex ultrasonography of the lower limb veins revealed a prominent hyperreflective blood clot in the left external iliac, common femoral, and proximal tibialis veins. The veins displayed slight dilation, were unable to be compressed, and showed no increase in size when the calf muscle was compressed, indicating the presence of deep vein thrombosis (DVT). **Diagnosis:** The patient was diagnosed with May-Thurner Syndrome (MTS) worsened by significant obesity, resulting in the blockage of the left common iliac artery and acute left lower limb ischemia grades 1-2a, based on the clinical presentation, laboratory findings, and imaging examinations. A substantial thrombus, spanning from the common femoral vein to the popliteal vein, has been identified, confirming the diagnosis of deep vein thrombosis (DVT) in the left lower limb. **Therapeutic Intervention:** The patient initiated anticoagulant medication with apixaban 5 mg and pregabalin 75 mg for the purpose of managing neuropathic pain. Due to the patient's diagnosis of MTS and the presence of substantial risk factors such as obesity and acute DVT, a multidisciplinary strategy was implemented. This involved seeking advice from vascular surgery regarding the possibility of using endovascular techniques to alleviate the compression of the iliac vein and prevent more blood clotting occurrences. The patient's treatment plan involved closely monitoring the effectiveness of anticoagulation therapy, managing pain, and scheduling regular follow-up appointments with vascular surgery and hematology. These appointments were necessary to assess the long-term effectiveness of anticoagulation therapy and the possibility of surgical interventions.

DISCUSSION:

May-Thurner Syndrome (MTS) is a condition where the left common iliac vein is compressed by the right common iliac artery. This poses a distinct difficulty in diagnosing and treating deep vein thrombosis (DVT), particularly in unusual cases like young males and individuals with severe obesity. This case involves a 20-year-old boy who is severely obese and experiencing acute deep vein thrombosis (DVT). It highlights important features of May-Thurner Syndrome (MTS), such as its underlying mechanisms, factors that increase the risk, methods of diagnosis, and treatment options. Pathophysiology refers to the study of the functional changes that occur in the body as a result of a disease or injury. Risk factors are conditions or behaviors that increase the likelihood of developing a certain disease or condition. The physical structure that causes MTS can lead to long-term venous insufficiency and make persons more susceptible to developing deep vein thrombosis (DVT). The presence of extreme obesity in our patient likely worsened venous compression and stasis, hence increasing the risk for thrombotic events. Obesity is linked to an inflammatory condition, higher pressure in the veins, and changes in blood clotting, all of which can individually raise the likelihood of developing venous thromboembolism (VTE) [9]. This instance underscores the need of healthcare providers acknowledging the combined danger posed by MTS and obesity.

Difficulties in Diagnosis: The diagnosis of MTS is frequently delayed until the manifestation of symptoms such as deep vein thrombosis (DVT), as observed in our patient. The diagnostic process is hindered by the vague and indistinct character of symptoms and the requirement for specialized imaging to verify venous compression and thrombosis. Duplex ultrasound, although beneficial, may not always definitively diagnose MTS, requiring additional confirmation through more sophisticated imaging methods such as CT or MR venography [10]. The intricate nature of the diagnosis highlights the significance of maintaining a heightened level of suspicion for May-Thurner Syndrome (MTS) in young patients who exhibit unexplained deep vein thrombosis (DVT), particularly in cases when conventional risk factors for DVT are not present or when there are unusual characteristics, such as severe obesity.

Treatment methods: MTS management necessitates a comprehensive and versatile strategy. Anticoagulation therapy is the primary treatment for DVT and was started for our patient. Additionally, the therapy of MTS may necessitate measures to alleviate the mechanical blockage, such as endovascular stenting. This procedure has demonstrated efficacy in relieving symptoms and decreasing the likelihood of recurrent deep vein thrombosis (DVT) [11]. The significance of weight control in mitigating the overall risk of VTE recurrence cannot be emphasized enough and should be seen as an integral component of a comprehensive treatment approach.

The Significance of Multidisciplinary Care: This instance exemplifies the need for a comprehensive strategy in the therapy of patients with MTS, which should involve experts in vascular medicine, hematology, and potentially bariatric surgery for the treatment of obesity. Coordinated care is crucial for managing both the immediate dangers of deep vein thrombosis (DVT) and the underlying anatomical and lifestyle variables that contribute to May-Thurner syndrome (MTS).

CONCLUSION:

The case of a 20-year-old male presenting with significant obesity and May-Thurner Syndrome (MTS) exacerbated by deep vein thrombosis (DVT) brings attention to important factors in the field of vascular medicine and thrombosis management. May-Thurner Syndrome (MTS) is a syndrome where the left common iliac vein is compressed by the right common iliac artery. It poses specific difficulties in diagnosis and treatment, especially in young males and those who are significantly obese. This case highlights the significance of maintaining a strong level of suspicion for May-Thurner Syndrome (MTS) in patients who have unexplained deep vein thrombosis (DVT) in the lower extremities, particularly when there are no typical risk factors present. The effective management of MTS necessitates a holistic strategy that encompasses the treatment of both the acute thrombotic event and the underlying anatomical defect that causes venous stasis. Anticoagulation therapy is essential for managing DVT, however in cases of venous compression in MTS, further therapies such endovascular stenting may be required to relieve symptoms and lower the chances of another blood clot forming. The substantial influence of obesity on the risk of venous thromboembolism adds more complexity to the management of MTS, highlighting the necessity for comprehensive care regimens that encompass weight control and lifestyle modification. This example also demonstrates the crucial significance of advanced imaging techniques in diagnosing MTS, emphasizing the constraints of conventional diagnostic methods in detecting anatomical venous compression. Effectively managing MTS requires a comprehensive approach that utilizes the knowledge and skills of various medical disciplines, including vascular surgery, hematology, radiology, and maybe bariatric surgery, to address the complex nature of this syndrome. To summarize, MTS is an intricate convergence of anatomical, physiological, and behavioral elements that can have a substantial influence on patient results. Prompt identification, comprehensive diagnostic assessment, and a customized, interdisciplinary treatment approach are crucial for enhancing the outlook of individuals with MTS. This example highlights the importance of being informed and vigilant while diagnosing and managing venous thromboembolic disorders, especially in patients who do not fit the conventional profile. Future research should focus on gaining a deeper understanding of the underlying mechanisms of MTS, refining diagnostic procedures, and assessing the long-term effectiveness of different treatment approaches in order to improve the quality of care for individuals with this complex disorder.

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Author contribution : The authors have all made substantive contributions to this case study. Bassam Almutairi had the idea for the case and drafted the manuscript. Mueed Alharthi and Feras Alqahtani contributed to diagnosing and editing. Anas Zarbah managed the supervision. Mohammed Alqarni managed follow-up. Abdulrahman Bin Saeed, Saleh Alshari, and Rahaf Alamri contributed to writing and collecting data in addition to clearing ethics. Maram Abu Matir contributed to the design of the study and final approval. All authors contributed to and have approved the manuscript. All authors agree on authorship order. The authors declare no known conflicts of interest. For acknowledgment the authors would like to thank the patient and their family for their cooperation and consent. Special thanks to the healthcare team for their support during the management of the case.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author, Bassam Almutairi, upon reasonable request at: balmutairi59@moh.gov.

The **Contributions and Ethical** data used to support the findings of this study are approved by the Aseer institutional review board with Approval Number REC-14-5-2024 .

Data are available from Bassam Almutairi , balmutairi59@moh.gov.sa

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