

May–Thurner Syndrome: A case of an extensive left lower limb deep vein thrombosis and delirium precipitated by acute urinary retention

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SUMMARY

May–Thurner syndrome (MTS) is an anatomical variant in which the left common iliac vein is compressed by the right common iliac artery against the fifth lumbar vertebrae. It predisposes patients to left leg venous congestion, deep vein thrombosis (DVT), and recurrent cellulitis. We describe a case of a 78-year-old man who developed an extensive left lower limb DVT and delirium after an episode of acute urinary retention due to underlying benign prostatic hyperplasia (BPH). His computed tomography (CT) was suggestive of MTS. While MTS predisposed him to develop DVT, his DVT was precipitated by venous compression due to acute urinary retention. Similarly, his delirium was precipitated by acute urinary retention and by disorientation due to environmental change and poor vision. Underlying dementia was suspected, and an outpatient dementia workup was arranged. His delirium resolved following treatment of his urinary retention and rehabilitation. He was given anticoagulation, treated for BPH, and weaned off his bladder catheter. Endovascular management with antithrombotic therapy post-stenting is the management of choice for patients with left leg DVT and MTS, but while this patient was referred to the vascular surgeon, he was not planned for endovascular therapy due to evidence of a resolved DVT on repeat Doppler ultrasonography. He was put on life-long anticoagulation with warfarin.

INTRODUCTION

May–Thurner syndrome (MTS) also known as ilio caval venous compression syndrome is an anatomical variant in which the left common iliac vein is compressed by the right common iliac artery against the lower lumbar vertebrae. This may predispose to venous outflow obstruction and increase the risk of left lower limb deep vein thrombosis (DVT)¹ and recurrent unilateral cellulitis.² Bladder distension due to urinary retention has also been reported as a provoking factor for DVT³ and is known to precipitate delirium.⁴ Here, we report a case of a patient with MTS, with underlying benign prostatic hyperplasia (BPH), who developed extensive left lower limb DVT and acute delirium after an episode of acute urinary retention.

CASE REPORT

A 78-year-old man presented to the emergency department with a 3-day history of painful left lower limb swelling, and altered behaviour. Before the onset of symptoms, he was

ambulatory, independent in his basic activities of daily living, had no history of fever or trauma to the lower limb, and no identifiable risk factors for thromboembolism such as immobilisation, constitutional symptoms, medications, smoking, or family history. He had underlying hypertension, dyslipidemia, bilateral eye cataracts, and glaucoma. He also had a history of lower urinary tract symptoms (urgency, nocturia, dribbling, incomplete voiding) with a previous history of recurrent episodes of acute urinary retention.

Physical examination revealed left leg oedema, warmth, and tenderness. Abdominal examination revealed a palpable bladder. The prostate was clinically enlarged. There was no lymph node palpable. Full blood count, liver function test, and coagulation profile were normal. Renal profile was impaired (Urea 10.1mmol/L, Creatinine 195mmol/L), and D-Dimer was positive (>20ug/mL). Ultrasound Doppler over the left lower limb showed an extensive left lower limb DVT involving the common femoral, superficial femoral, and popliteal veins. Abdominal ultrasound revealed prostatomegaly. Prostate-specific antigen, alpha-fetoprotein, carcinoembryonic antigen, and CA-19-9 were all normal.

He was diagnosed with left leg DVT with acute delirium, precipitated by urinary retention and disorientation due to an unfamiliar environment and poor vision. A urinary catheter was inserted, and medication for BPH (tamsulosin and dutasteride) was started. He was transferred to the Geriatric subacute cubicle for delirium and medical management. His delirium gradually resolved following the resolution of his urinary retention, and with rehabilitation. His renal function normalised during the admission, and he was weaned off the urinary catheter. His DVT was treated with warfarin with an initial course of enoxaparin. He was discharged with an early appointment for a computed tomography (CT).

Since discharge, he had received one course of outpatient treatment for left lower limb cellulitis, and his left lower limb erythema, pain, induration, and oedema have gradually resolved. CT findings were suggestive of MTS. The case was referred to a vascular surgeon for endovascular treatment and stenting. A repeat Ultrasound Doppler demonstrated resolution of the DVT. There were no plans for endovascular intervention due to the evidence of a resolved DVT, but he was put on life-long anticoagulation with Warfarin. He is also currently being worked up for suspected dementia.

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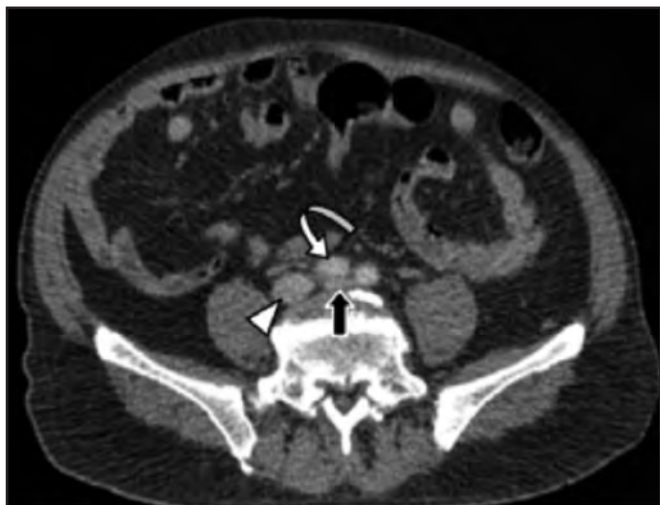


Fig. 1: Axial contrast-enhanced CT image showed slit-like appearance of left common iliac vein (black arrow) due to compression by the overlying right common iliac artery (curved white arrow). The right common iliac vein (white arrowhead) was normal in calibre and patent



Fig. 2: Coronal contrast-enhanced CT image showed long segment thrombosis of the left external iliac and common femoral vein (black arrow) as is typical of a DVT with underlying May–Thurner syndrome

DISCUSSION

MTS may be a relatively common finding. A retrospective review of abdominal CT scans in asymptomatic patients found that 24% of patients had greater than 50% compression of the left iliac veins with the most commonly compressed structure being the left common iliac vein.³ In a population-based study, it was found that 55.9% of all DVTs occur on the left side, and this tendency was not influenced by obesity, age, sex, surgery, injury, or oral contraceptive use.⁵ This suggests that left common iliac vein occlusion by the right common iliac artery maybe is the only plausible explanation for this predominance. However, clinically recognized MTS accounted for only 2–5% of all DVTs,⁶ which might suggest an under-diagnosis of MTS.

MTS may be asymptomatic, but patients are predisposed to developing lower limb oedema, varicosities, venous claudication, venous eczema, venous ulceration, DVT, and recurrent cellulitis.^{2,7} Any insult which contributes to Virchow’s triad of stasis, hypercoagulability, and endothelial dysfunction may provoke an episode of DVT in patients with MTS. In this case, the patient was asymptomatic until the onset of urinary retention. Bladder distension due to urinary retention has been reported as a provoking factor for DVT.⁸

What triggered a suspicion of MTS in this patient was the finding of an extensive left lower limb DVT, with absence of conventional risk factors for DVT. MTS should be suspected in any patients with venous insufficiency, recurrent cellulitis, or extensive DVT affecting the left lower limb. It should be noted that symptomatic MTS occurs more frequently in younger women compared to men, at a ratio of 2:1,⁹ so in there should be an index of suspicion of MTS in this demographic group. The reasons for this predisposition are unclear. It might be due to a combination of pregnancy, hormonal changes, or

oral contraceptive pill use predisposing to thrombosis, leading to detection of this anatomical variant.

Several imaging modalities can be employed to diagnose MTS.⁵ Colour Doppler ultrasonography can be used as an initial, non-invasive imaging modality. It can help to identify DVT, which is a common complication of MTS. However, it is difficult (but possible) to demonstrate common iliac vein compression through ultrasound due to limitations such as body habitus and overlying bowels. CT was found to have high sensitivity and specificity in confirming a diagnosis of MTS. Magnetic resonance venography (MRV) has high sensitivity and specificity for detecting MTS and can be done without contrast or radiation. However, MRV has the disadvantages of higher cost, more time consumption, and limited availability.

In patients with MTS and DVT, therapeutic doses of anticoagulation should be started upon diagnosis. Endovascular treatment should be performed in combination with anticoagulation. Endovascular intervention should include catheter-directed thrombolysis or pharmacomechanical thrombolysis followed by angioplasty and stenting of the affected ilio caval segment.⁸ In this case, management was limited to anticoagulation as a repeat Doppler ultrasound has demonstrated the resolution of the DVT.

The optimal duration of anticoagulation following an episode of DVT with MTS is unclear, especially in patients who did not undergo endovascular treatment. In a recently published case series of eight patients, where only two received endovascular stenting, left lower limb DVT recurred in one out of three patients who received 6 months of anticoagulation and one out of five patients who were given

life-long anticoagulation.¹⁰ However, these two patients had additional thrombotic risk factors.

The focus of our case report is on MTS, but delirium is an important clinical condition that is worth mentioning. This patient had several predisposing factors for developing delirium: his age, visual impairment due to bilateral cataracts with glaucoma, and we suspect he had underlying dementia. His delirium was precipitated by acute urinary retention and disorientation to his environment during the acute admission. Known precipitating factors for delirium include acute illness/injury, environmental change, physical discomfort, use of physical restraint, and iatrogenesis. It is important to look for and treat these precipitating factors to treat delirium. There are currently no local clinical practice guidelines on the management of delirium, but the Malaysian Society of Geriatric Medicine has published a position statement on delirium which could serve as a reference.⁴

CONCLUSION

MTS predisposes to left lower limb DVT, venous congestion, and recurrent cellulitis. Patients presenting with extensive, unilateral left-sided DVT should be evaluated for MTS. Urinary retention due to BPH may provoke DVT in patients with MTS. Treatment of DVT with underlying MTS involves a combination of anticoagulation and endovascular therapy.

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