May-Thurner Syndrome, an often overlooked cause of deep vein thrombosis: a case report

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Abstract

Deep vein thrombosis (DVT) is a common medical condition but the predisposing anatomical factors, which may be amenable to a definitive treatment, are usually overlooked; a high index of clinical suspicion is the key to an early diagnosis. We report here one such case of May-Thurner syndrome to raise awareness. May-Thurner syndrome (iliac vein compression syndrome) should be suspected in case of extensive DVT of leg, particularly involving iliac vein on the left side. The prognosis is improved with thrombolysis followed by angioplasty and stent to address the venous stenosis.

Keywords: May-Thurner syndrome; deep vein thrombosis; iliac vein compression syndrome.

Introduction

Deep vein thrombosis (DVT) with a reported incidence of 45-117 cases per 100,000 person-years¹ is quite common. Some patients have a hereditary thrombophilic tendency. In those with first time DVT, factor V Leiden and prothrombin G20210A mutations with an incidence of 20-25% and 6-18% respectively are the most common.² Many environmental factors and acquired medical conditions also play a role, e.g., immobility, recent surgery, an air travel longer than 4 hours and presence of cancer or inflammatory bowel disease. On the other hand, some patients have an apparently unprovoked DVT. In some of these seemingly
idiopathic cases, interesting remediable anatomical causes can be discovered if pursued further. Here we present a case report of May-Thurner Syndrome to raise awareness.

Case Report

A 45 years old lady was admitted with first episode of unprovoked DVT of left leg.

She presented with one day history of spontaneous pain and swelling of left leg. The pain was of mild to moderate intensity, radiating from the groin to involve the whole left leg.

She was married for five years but had no children. A right ovarian cyst was discovered during workup for primary infertility. She was to undergo cystectomy and received a two-week course of Norethisterone 5mg twice daily which completed a week ago.

She had received a shot of intra-articular steroid in her left knee for osteoarthritis three months ago but was well and active and was not on any medications now.

There was no family history of DVT.

She was an average-built pleasant lady with normal vitals. Her left leg was grossly swollen, but not erythematous, hot or tender, with intact distal pulses. The circumference of the calf, 15cm below the tibial tuberosity, was 42cm on the left as compared to 34cm on the right. Rest of the physical examination was unremarkable apart from mild tenderness and a vague feeling of a small soft mass in right lower abdomen.

The routine investigations and a chest X-ray were normal.

The venous Doppler revealed extensive DVT of left common and superficial femoral veins (misnomer, actually a deep vein). Abdomino-pelvic ultrasound showed a 4.5x4cm right ovarian cyst.

An abdominal CT scan with contrast confirmed a long thrombus involving left femoral and external iliac veins (EIV) extending up to distal part of left common iliac vein (CIV), raising suspicion of May-Thurner Syndrome (MTS) (figures 1 and 2); the right adnexal cyst appeared benign (GI-RADS 2).
Figure 1: A CT scan showing thrombus in left common iliac vein.
Figure 2: A CT scan axial view showing compression of left common iliac vein by the right common iliac artery against the vertebral body.

An MRI showed compression of the left CIV by the right common iliac artery (CIA) with a subacute venous thrombus distal to the compression (figure 3).
Figure 3: The MRI angiogram depicting thrombosis and compression of left common iliac vein by the right common iliac artery (May-Thurner syndrome).

She was started on therapeutic dose enoxaparin and referred to vascular surgery; however, she was managed conservatively as she was doing well. Six months later, a follow-up Doppler showed partial recanalization of common femoral and near-complete recanalization of left EIV and CIV. The laparoscopic removal of the right ovarian cyst later on confirmed a simple serous cyst.

Discussion

May-Thurner Syndrome, also known as Cockett’s or iliac vein compression syndrome, means compression of left CIV by the right CIA against L5 vertebra, but other variants of compression of ilio-caval veins by arterial system also exist. The fact that DVT of pelvic veins is five times more common on the left, primarily due to compression by the overlying artery, was known since time of Virchow a century ago. However, May and Thurner were the first to observe that a collagen and elastin spur is formed on inner wall of the vein due to
repeated trauma of chronic pulsation of overlying right CIA. The spur causes partial obstruction and predisposes to thrombosis.\textsuperscript{5}

Thrombosis in Ilio-femoral veins is responsible for approximately 2-23\% cases of DVT in lower limbs;\textsuperscript{6} about 50-60\% of such cases of DVT on the left side are associated with spurs in CIV due to external compression.\textsuperscript{7}

Although MTS is the cause in only 1-5\% of patients with lower extremity venous symptoms of swelling or DVT\textsuperscript{8}, the frequency of \textit{May-Thurner anatomy} in asymptomatic population is much higher. A compression of left CIV of >50\% was noticed in about 24\% of cases in a study in which CT scan of abdomen was done for reasons other than leg symptoms.\textsuperscript{9}

MTS classically presents in young females in their second or third decade, noticed by Cockett in 1965,\textsuperscript{10} typically with swelling of left leg of a few weeks duration, though right sided and bilateral cases do occur.\textsuperscript{3,11} About one-third of the patients are males.\textsuperscript{12} DVT is an acute presentation; and surgery, pregnancy and prolonged bed rest have been described as acute triggers. DVT can occur even during prophylactic anticoagulation.\textsuperscript{13} Chronic presentations include post-thrombotic syndrome, lower limb swelling, venous claudication and pelvic congestion in females.\textsuperscript{14}

Duplex ultrasound of iliac veins, though technically challenging, is usually performed first, followed by spiral CT or MR venography, both of which have >95\% sensitivity and specificity for diagnosing MTS\textsuperscript{15,16} and can, in addition, reveal a pelvic mass. Nevertheless, dehydration and inadequate perfusion of the pelvic veins may affect the diagnostic ability of these imaging modalities.

Conventional venography has long been a gold-standard for the diagnosis of MTS,\textsuperscript{13} but is rarely used now. The use of intravascular ultrasound (IVUS) appears to be superior\textsuperscript{17} and may obviate the need for venography.

Treatment of MTS depends on the presence or absence of DVT. MTS with minimal or no symptoms may be managed conservatively with compression stockings, but in those with more severe symptoms of chronic venous insufficiency, relief of stenosis by a stent really helps.\textsuperscript{18} In cases of MTS with ilio-femoral DVT, anticoagulation alone leads to complete recanalization in only 20-30\% of cases,\textsuperscript{19} and incidence of post-thrombotic syndrome or recurrent DVT remains high. However, an early catheter-directed thrombolysis or pharmacomechanical thrombectomy, followed by angioplasty and stent in the stenosed vein, is
associated with greatly improved results. Raju reviewed about 1500 patients with iliac vein stenosis, with or without thrombosis: the placement of stent was safe, relieved pain in 90% and helped swelling and venous ulcers in two-thirds or more. Rarely open surgery may be required if endovascular therapy fails.

Our patient was managed conservatively and she was doing well on follow-up.

**Conclusion**

DVT is usually managed with a course of anticoagulation, but it is worthwhile to *dig deep* in some cases where remediable conditions with more definitive treatments and better prognosis may be found. For example, DVT of the iliac veins may be due to arterial compression necessitating a stent.

**References**


