American Journal of Case Reports

ISSN 1941-5923
© Am J Case Rep, 2017; 18: 226-229
DOI: 10.12659/AJCR.902776

Received: 2016.12.10
Accepted: 2017.01.22
Published: 2017.03.06

An Unusual Endovascular Therapeutic Approach for a Rare Case of May-Thurner Syndrome

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABDEF 1 Adrian DaSilva-DeAbreu
ABDEF 2 Luke Masha
BDEF 1 Shareez Peerbhai

1 Department of Internal Medicine, McGovern Medical School, The University of Texas Health Science Center at Houston, Houston, TX, U.S.A.
2 Department of Internal Medicine, Section of Cardiovascular Medicine, McGovern Medical School, The University of Texas Health Science Center at Houston, Houston, TX, U.S.A.

Corresponding Author: Adrian DaSilva-DeAbreu, e-mail: adrian.j.dasilvadeabreu@uth.tmc.edu
Conflict of interest: None declared

Patient: Male, 69
Final Diagnosis: May-Thurner syndrome secondary to left common iliac artery aneurysm
Symptoms: Left lower extremity edema • left lower extremity erythema • left lower extremity pain
Medication: —
Clinical Procedure: Endovascular aneurysm repair (EVAR) of the infra-renal abdominal aorta aneurysm and right common iliac artery aneurysm
Specialty: Cardiology

Objective: Unknown ethiology

Background: The etiology of deep venous thrombosis (DVT) may pose a significant diagnostic challenge because truly reversible causes of DVT are rare. In this regard, known pelvic anatomic abnormalities such as aortic and iliac aneurysms should be seriously considered as a complicating factor in patients presenting with acute DVT so as not to miss a potentially curable etiology of May-Thurner syndrome (MTS).

Case Report: We report the case of a 69-year-old man with a known abdominal aortic aneurysm and bilateral iliac artery aneurysms who presented with an acute DVT. A computed tomography scan of the abdomen and pelvis showed increased dilation of his aneurysmal disease with new resultant compression of the left iliac vein representing acquired MTS. The patient underwent endovascular aneurysm repair of the infra-renal abdominal aortic aneurysm and right common iliac artery aneurysm with a Gore Excluder endoprosthesis in lieu of venous stenting, with resolution of symptoms.

Conclusions: Infra-renal aortic and iliac aneurysms causing MTS are extremely rare, and patients at risk for MTS through these mechanisms do not fit the classical demographics associated with this syndrome. Furthermore, this is the first case described in which MTS was treated by addressing the aneurysm through an endoprosthetic approach instead of venous stenting, which is the conventional intervention for MTS.

MeSH Keywords: Anticoagulants • Aortic Aneurysm, Abdominal • Endovascular Procedures • Iliac Aneurysm • May-Thurner Syndrome • Venous Thrombosis

Full-text PDF: http://www.amjcaserep.com/abstract/index/idArt/902776

Background

The etiology of a deep venous thrombosis (DVT) may pose a significant diagnostic challenge because truly reversible causes are rare. Further concerns rise whenever patients develop this condition in spite of being on anticoagulation, indicating a major pro-coagulant state, either due to biochemical or mechanical factors. In this regard, known pelvic anatomic abnormalities should not be overlooked as they may suggest the presence of May-Thurner syndrome (MTS) and thus may change management strategies. Here, we call attention to the role that infra-renal aortic and iliac aneurysms may play in DVT presentation and management by describing a rare case of the acquired MTS, as well as the unusual endoprosthetic therapeutic strategy we used.

Case Report

A 69-year-old man presented to our facility complaining of acute left lower-extremity pain, erythema, edema, and weakness for 2 days. He had a history of an infra-renal abdominal aortic aneurysm (AAA) that extended to his common right iliac artery, an ascending aortic aneurysm, and advanced coronary artery disease complicated by stage D heart failure. Two years prior, his AAA was known to be 3.3 cm in maximal diameter at the distal aorta, 3.8 cm at the bifurcation of the bilateral common iliac arteries, and 4.0 cm at the proximal right common iliac artery (Figures 1A, 2A).

Three months before this presentation, he underwent a simultaneous orthotopic heart transplant for progressive heart failure and thoracic aortic aneurysm repair. Twelve hours postoperatively, the patient developed acute right lower-extremity critical limb ischemia and acute compartment syndrome involving the proximal right thigh. Emergent angiography showed a 100% right common iliac arterial occlusion. The left common iliac artery at this time was also found to have a high-grade occlusive disease. He was treated with bilateral common iliac angioplasty and bilateral common iliac stent placement. A right lower-extremity fasciotomy for compartment syndrome was also performed. The patient improved with these measures. His post-operative course was prolonged, during which, at separate points, the patient was diagnosed with bilateral internal jugular DVT attributed to long-standing central lines, repeat myocardial biopsies, and recent surgery. However, he was eventually discharged to home care.

At the time of presentation with left lower-extremity pain, he was receiving 100 mg of enoxaparin subcutaneously every 12 hours and had been compliant for at least one month. Physical exam showed left lower-extremity edema and mild erythema. A lower-extremity Doppler ultrasound showed a sub-acute to chronic non-occlusive thrombus in the left common femoral vein and profunda vein, with sluggish blood flow throughout the left lower-extremity system. Under suspicion of occlusion of the central venous system, he underwent a contrast-enhanced computed tomography scan of the abdomen and pelvis, which showed a significant increase in size of his known infra-renal AAA, which now measured 3.9 cm at maximal diameter at the distal aorta, 4.4 cm at the bifurcation, and 4.8 cm at the proximal right common iliac artery (Figure 1B). The left common femoral vein was found to be dilated. There was nearly complete effacement of the origin of the left common iliac vein by the visible infra-renal AAA and right common iliac artery aneurysm (Figures 1B, 2B). These findings were suggestive of acquired MTS.

The patient underwent endovascular aneurysm repair (EVAR) of the infra-renal AAA and right common iliac artery aneurysm with a 28.5×12×18 mm Gore Excluder endoprosthesis (Figure 3). The procedure was tolerated well and there were no perioperative complications. The pain and edema of his left lower extremity resolved. He is still receiving anticoagulation at this time for other indications, he continues to do well with no evidence of recurrence of lower-extremity DVT to date.

Discussion

Venous thromboembolism (VTE) is a significant health problem, with an estimated annual incidence of 900 000 VTE events [1] leading to approximately 540 000 hospitalizations [2] annually in the U.S. VTE continues to be a high-mortality condition with an estimated 30-day mortality of 10% despite advances in medical therapy [3]. Furthermore, current therapy for this condition involves long-term anticoagulation in the absence of rarely identified transient or curable etiologies of VTE. Such therapies are associated with a small but significant risk of major hemorrhage [4] and have the added costs of requiring physician and laboratory monitoring. Therefore, identifying reversible etiologies of VTE is highly desirable so as to shorten or avoid exposure to anticoagulation as best possible.

MTS is a rare reversible etiology of VTE. The syndrome reflects lower-extremity swelling and pain, often associated with recurrent DVT secondary to extrinsic compression of the left iliac vein by an overriding right common iliac artery. The classic description by May and Thurner [5] described compression of the left iliac vein (with resultant formation of peculiar luminal fibrous “spur-like” projections at the site of compression) leading to wall injury, luminal obliteration, venous stasis, and ultimately thrombosis. If overt thrombosis does not occur, chronic and refractory unilateral venous insufficiency may instead be present. MTS is generally more common in women (75% to 100% of cases [6,7]), in whom it is usually diagnosed in the

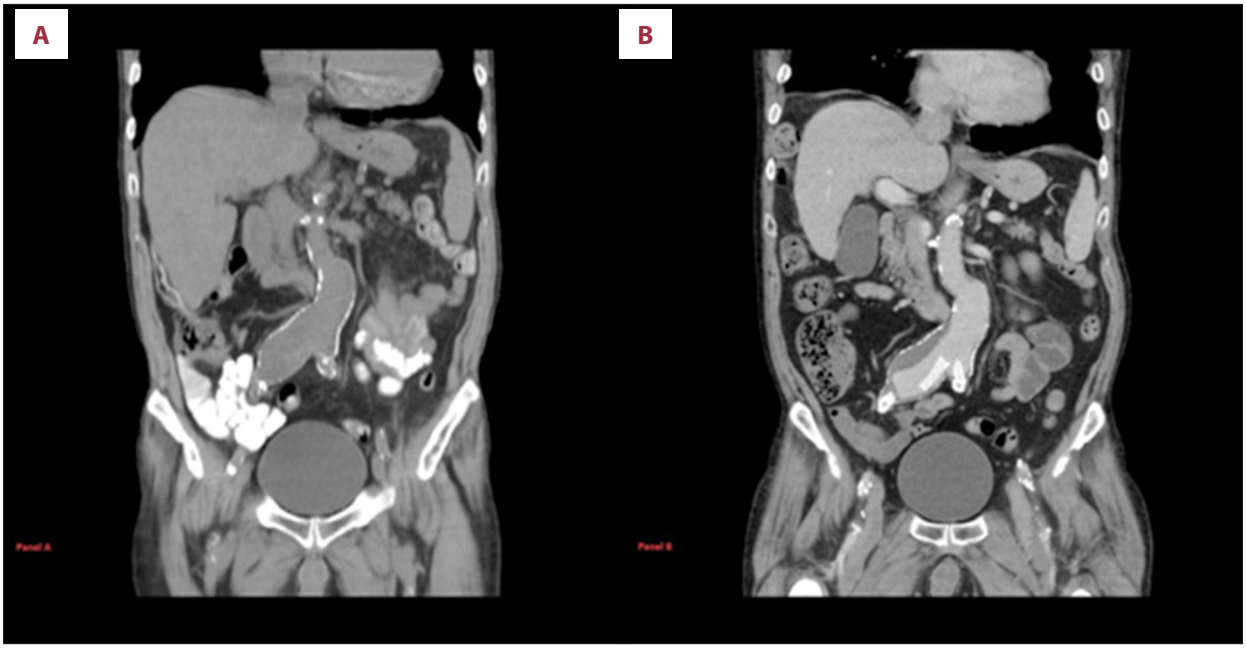

Figure 1. CT abdomen and pelvis showing progressive increase in aneurysm size over 2 years.

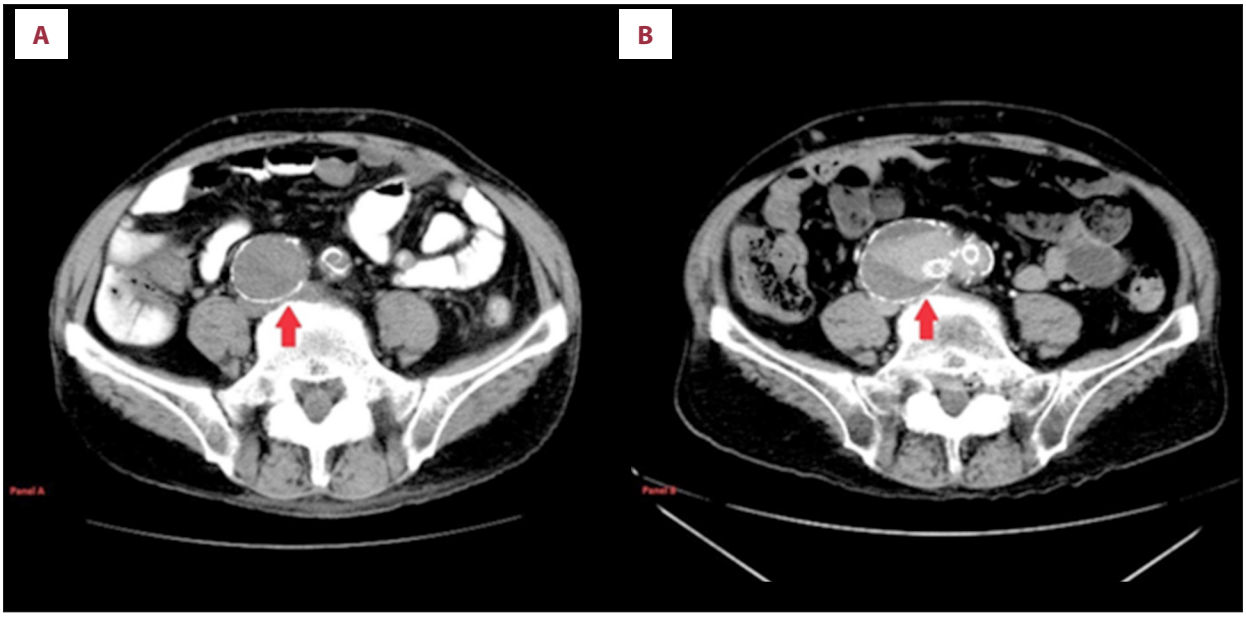

Figure 2. CT abdomen and pelvis showing worsened compression of left common iliac vein by growing aneurysm.

second or third decade of life. It also may be seen in pregnancy due to compressive effects of the gravid uterus on the pelvic veins, and in severe scoliosis [8]. The frequency of MTS in the DVT population is unknown. However, contemporary studies have suggested that perhaps up to 24% of the general population have at least 50% compression of the left iliac vein [9] and high-grade compression (greater than 70%) is associated with unilateral left-sided DVT [10]. The contribution of this anatomic variant to the mild excess of left-sided DVT seen consistently in observational studies [11,12] remains unclear.

Thus, the present case is a particularly atypical presentation of MTS, as our patient does not demographically or mechanistically fit the traditional description. Our literature review found evidence of only one other case similar in nature. Pandit et al. [13] described a case of acquired MTS after EVAR for an infra-renal AAA attributed to a morphological change in a normal common iliac artery after arterial stenting. As the source of compression in MTS most commonly involves a relatively normal iliac artery, treatment has traditionally focused on scaffolding the compressed vein via stenting. For example,

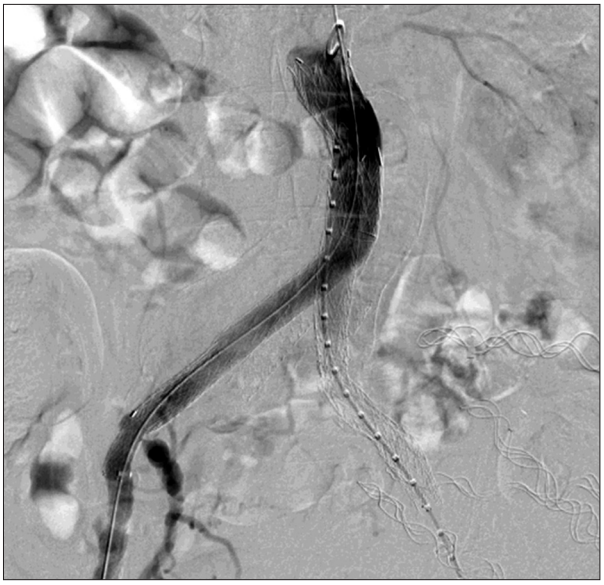

Figure 3. Aortic angiogram demonstrating successful deployment of Gore Excluder Homograft.

the patient described by Pandit et al. received conventional venous stenting with good result. Our case is particularly notable as significant pathology resides in the compressing artery and this was amenable to interventions in that regard. Repair of an aneurysmal aorta and iliac artery with an endograft results in transfer of aortic pulsatile flow and associated shear forces from the aneurysm walls to the lumen of an endograft, thus reducing aneurysm vessel wall stress and ultimately size [14]. Experience with EVAR has shown that successful deployment of a stent-graft in the absence of an endoleak results in a reliable decrease in aneurysm size [15]. In our case, even moderate decreases in aneurysm size may have allowed for a reduction in duration of anticoagulation in the absence of other indications given the patient's asymptomatic status with milder degrees of arterial aneurysmal dilation.

Conclusions

We described a rare presentation of an uncommon, potentially curable etiology of DVT. Physicians should maintain a high index of suspicion for MTS in patients who present with lower-extremity DVT and have known abnormal intra-pelvic anatomy, so as not to miss this diagnosis. Furthermore, our patient expands the demographic description associated with this disorder and highlights a novel strategy for addressing it.

This is the first case described in which MTS was treated by addressing the aneurysm through an endoprosthetic approach instead of venous stenting, which is the conventional intervention for MTS.

Conflicts of interest

The authors declare no conflicts of interest.

Acknowledgement

The authors would like to thank Dr. Pranav Loyalka for his assistance, advice and insight into the development of this case report.

References:

1. Beckman MG, Hooper WC, Critchley SE, Ortel TL: Venous thromboembolism: A public health concern. Am J Prev Med, 2010; 38: S495–501
2. Hall MJ, DeFrances CJ, Williams SN et al: National Hospital Discharge Survey: 2007 summary. Natl Health Stat Rep, 2010; 26: 1–20, 24
3. Cushman M, Tsai AW, White RH et al: Deep vein thrombosis and pulmonary embolism in two cohorts: the longitudinal investigation of thromboembolism etiology. Am J Med, 2004; 117: 19–25
4. Prins MH, Lensing AW, Bauersachs R et al: Oral rivaroxaban versus standard therapy for the treatment of symptomatic venous thromboembolism: A pooled analysis of the EINSTEIN-DVT and PE randomized studies. Thromb J, 2013; 11: 21
5. May R, Thurner J: The cause of the predominantly sinistral occurrence of thrombosis of the pelvic veins. Angiology, 1957; 8: 419–27
6. Lamont JP, Pearl GJ, Patetsios P et al: Prospective evaluation of endoluminal venous stents in the treatment of the May-Thurner syndrome. Ann Vasc Surg, 2002; 16: 61–64
7. O'Sullivan GJ, Semba CP, Bittner CA et al: Endovascular management of iliac vein compression (May-Thurner) syndrome. J Vasc Interv Radiol, 2000; 11: 823–36
8. Oteros Fernandez R, Bravo Rodriguez F, Delgado Acosta F, González Barrios I: [May-Thurner syndrome and surgery for scoliosis]. Radiologia, 2008; 50: 245–47 [in Spanish]
9. Kibbe MR, Ujiki M, Goodwin AL et al: Iliac vein compression in an asymptomatic patient population. J Vasc Surg, 2004; 39: 937–43
10. Narayan A, Eng J, Carmi L et al: Iliac vein compression as risk factor for left- versus right-sided deep venous thrombosis: Case-control study. Radiology, 2012; 265: 949–57
11. Ouriel K, Green RM, Greenberg RK, Clair DG: The anatomy of deep venous thrombosis of the lower extremity. J Vasc Surg, 2000; 31: 895–900
12. Thijs W, Rabe KF, Rosendaal FR, Middeldorp S: Predominance of left-sided deep vein thrombosis and body weight. J Thromb Haemost, 2010; 8: 2083–84
13. Pandit AS, Hayes M, Guiney-Borgelt S, Dietzek AM: Iatrogenic May-Thurner syndrome after EVAR. Ann Vasc Surg, 2014; 28: 739.e17–20
14. Greenberg RK, Deaton D, Sullivan T et al: Variable sac behavior after endovascular repair of abdominal aortic aneurysm: Analysis of core laboratory data. J Vasc Surg, 2004; 39: 95–101
15. Chang RW, Goodney P, Tucker L-Y at al: Ten-year results of endovascular abdominal aortic aneurysm repair from a large multicenter registry. J Vasc Surg, 2013; 58: 324–32