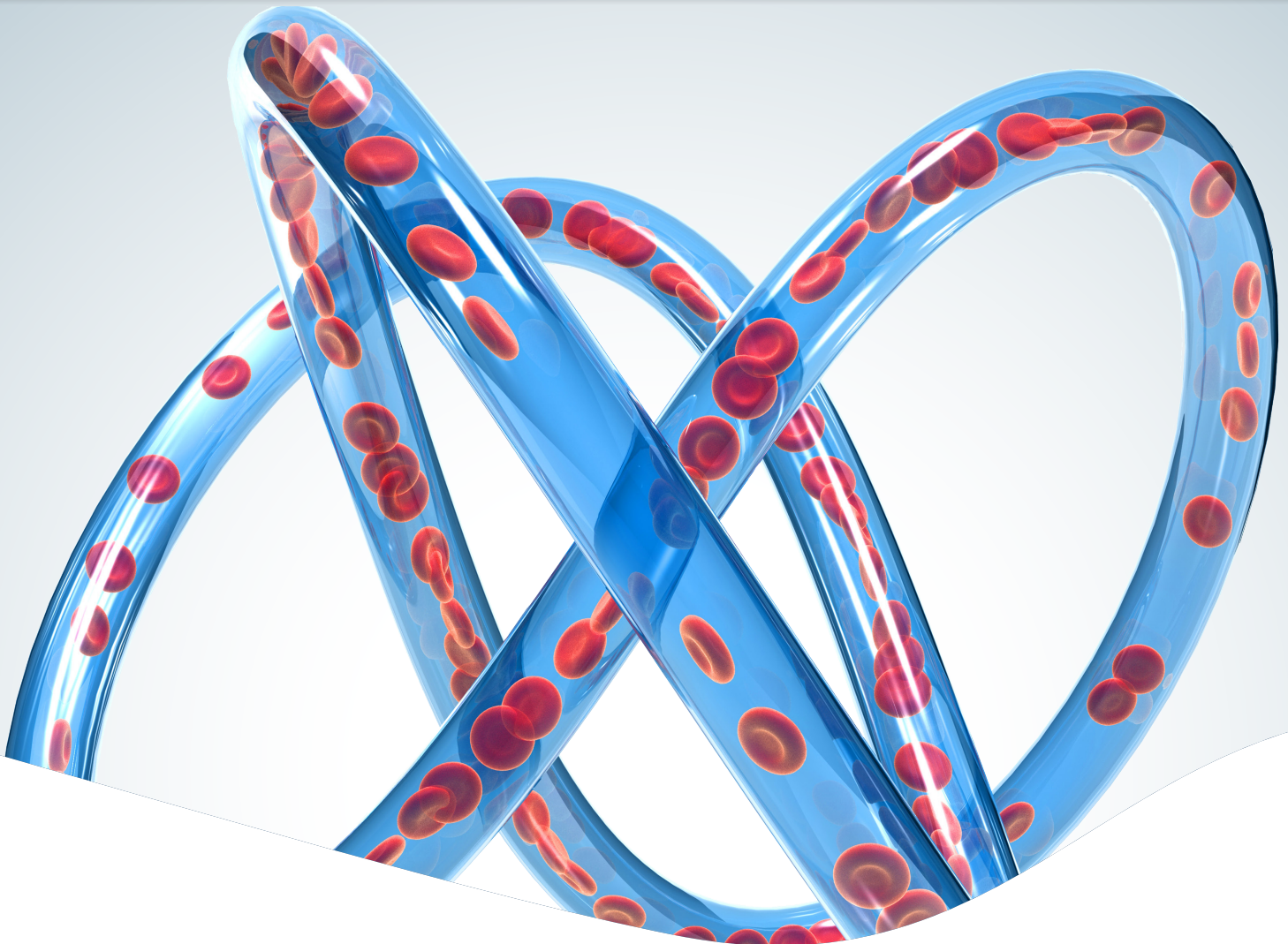


OCTOBER 2020
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NEWSLETTER



DIFFICULT & INTERESTING CASES



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Hot Mess and Out of Control: Difficult and Unusual Cases

220 Central Park South in NYC is a hot mess. People with a lot of money, a real lot of money, are buying apartments. Why? Because they can? In one month, three separate apartments were sold. Selling prices between 61 and 63 million dollars. Most apartments were around 6,000 square feet. They are apartments not houses. Can they ever be called “home?” Do you think of an apartment with four bedrooms, five full baths, two powder rooms (what does one do in a powder room?), and panoramic views of NYC as “home?” Where is Norman Rockwell when you need him? Norman shaped our ideal construct of “home” with his stage-set depiction of a bucolic, utopian home. We all long for this but most of us never get there. Most of us don’t get anywhere near 220 Central Park West either. Where do we wind up? Purgatory. As Thoreau said in his book *Walden*, “Most of us live lives of quiet desperation.” He felt most of us acquire “things to fill voids in our lives: money, possessions, accolades” and 63 million-dollar apartments.

What would Norman think? Norman Rockwell was born in 1894 and died in 1978. For 50 years he shaped our idealistic image of America. The surrealistic dream of our founding fathers. Putting aside his well-known paintings and magazine covers for *The Saturday Evening Post*, *Boy’s Life*, *Post Magazine*, and *Boy Scouts of America*, he was a true patriot. During WWI he wanted to join the Navy, but he was too thin, six feet tall and 140 pounds. He ate a lot of bananas and doughnuts. He finally gained enough weight. He went to the Navy. Who else but Norman our idealistic, American icon would do this? Most of us want to lose weight.

Let’s get back to the penultimate hot mess of American aspiration, 220 Central Park West. Each



—Steve Elias, MD

buyer was shielded by a third-party LLC that bought the apartment for them. Anonymity, a virtue or a fault? I say own up to your need for five bathrooms and two powder rooms. How many options do wealthy people need to relieve themselves?

Luckily, in this issue of *Vein Specialist* our contributors and our members own up to their “Difficult and Unusual Cases.” They don’t hide behind some LLC or pseudonym. They put it all out there. Mohammed Abbassi and Julio Hajdenberg present a case of “Not Your Usual May-Thurner Syndrome.” Another case of compression is discussed by Eric

Hager, “Uterine Fibroid – An Uncommon Cause of May-Thurner Syndrome.” It seems that May-Thurner Syndrome lends itself to difficult and unusual cases. And if that isn’t enough unusual pathology, Haraldur Bjarnason shows us another lethal combination of pathologies. Windsor Ting helps understand what to do when venous compression and arterial disease coexist. Nikita Singh and Anil Hingorani give us a case with the upbeat title, “Not A Happy Ending.” One can’t make this stuff up. How about another difficult case, “Pregnant, Thrombosed and Hypercoagulable.” Sounds easy to manage. Edgar Guzman and Julio Hajdenberg tell us how they did it.

Let’s revel in the transparent contributions to this issue of our members. They did not need to do their work at 220 Central Park South. They didn’t need 6,000 square feet. They did not need five bathrooms. They needed an opportunity to help all of us learn from their experience. That’s what we all need to do as AVF members, learn from each other, help each other. That’s why we have *Vein Specialist*. And that’s why we read *Vein Specialist*. Read, enjoy and learn.



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Not Your May Thurner Syndrome

–Mohammad Abbasi MD

Orlando Health Heart and Vascular Institute

–Julio Hajdenberg, MD

Orlando Health UF Health Cancer Center

The prevalence of venous interventions has exploded over the past decade with more physicians becoming familiar with May Thurner anatomy. However, the presence of compression does not necessarily denote a physiologic compromise necessitating treatment; a point that appears to be lost upon many. Rarely are less frequent causes of compression considered.

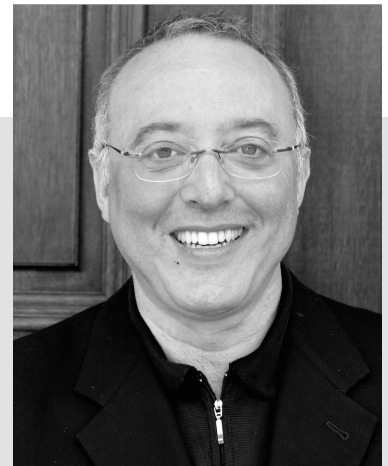
Recently we treated a 67-year-old female who presented with acute onset of left lower extremity edema with tightness in her calf and thigh, as well as pleuritic chest pain. Duplex ultrasound of the lower extremity demonstrated occlusive thrombus in the left distal external iliac vein, common femoral vein, femoral vein, and deep femoral vein. CT PE confirmed sub massive pulmonary embolism. A cystic pancreatic mass incidentally found but the lower abdomen was not visualized. Right heart strain was noted on ECHO cardiogram. On examination she was hemodynamically stable with continued chest pain, mild diffuse tenderness to palpation on her abdominal exam and with severe 3+ edema to the left lower extremity.

She underwent successful thrombolytic therapy for her pulmonary embolism by cardiology. Due to the significant swelling and discomfort in her left lower extremity the patient underwent thrombolytic therapy of this extremity via a left popliteal approach with subsequent mechanical thrombectomy with a Cat 12 Penumbra catheter. Intravascular ultrasound (IVUS) revealed complete occlusion of the proximal left common iliac vein with compression by the right common iliac artery. The distal IVC also appeared to have luminal collapse however no external point of compression was seen (Image 1).

Balloon angioplasty and stenting were performed with Wall stents extending from the caval confluence to the left common femoral vein. Despite repeated angioplasty, the stents still appeared compressed proximally (Image 2). Because of the lack of response the procedure was terminated and a CT of her abdomen and pelvis was obtained, demonstrating a Uterine mass measuring 20 cm by 24 cm by 18 cm, with compression of the proximal iliac stent and distal IVC (Image 3).



– Mohammad Abbasi MD

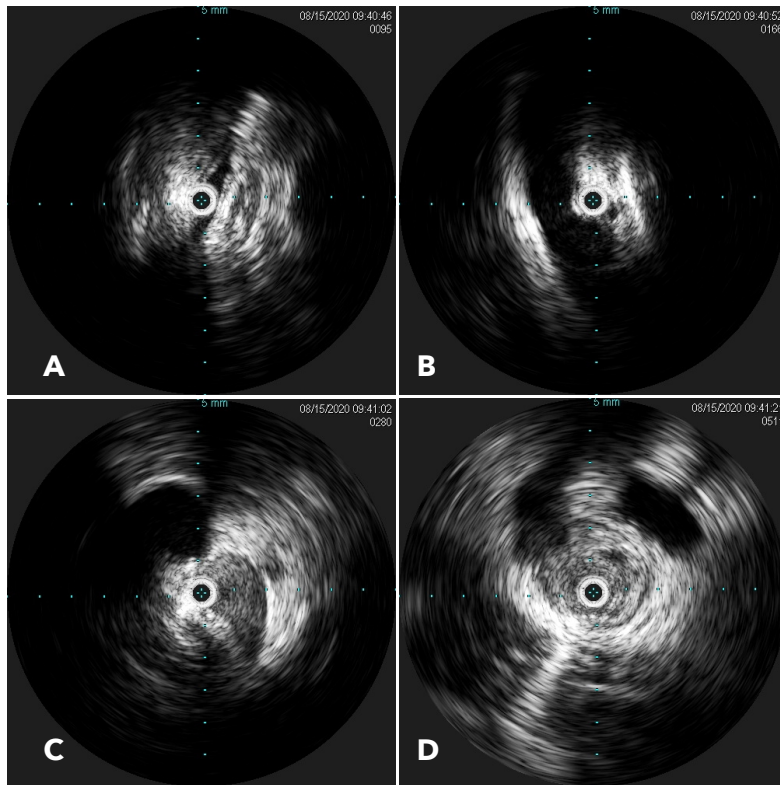


– Julio Hajdenberg, MD



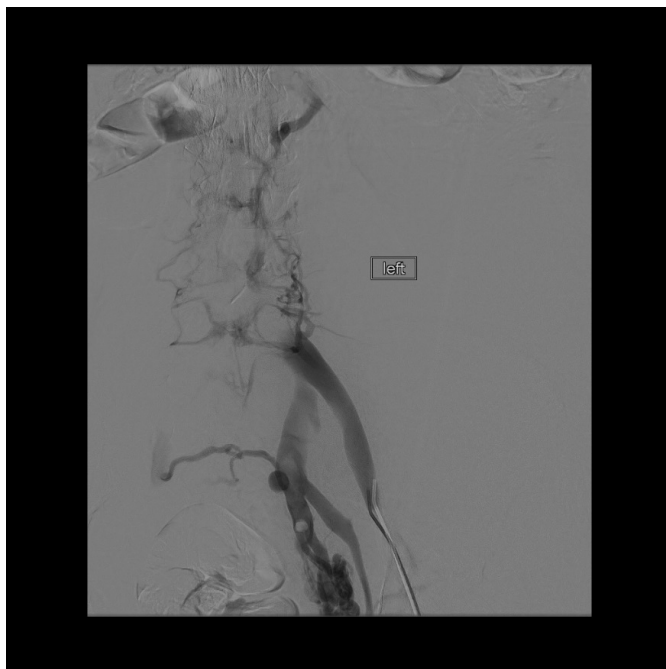
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IMAGE 1 | Panel 1

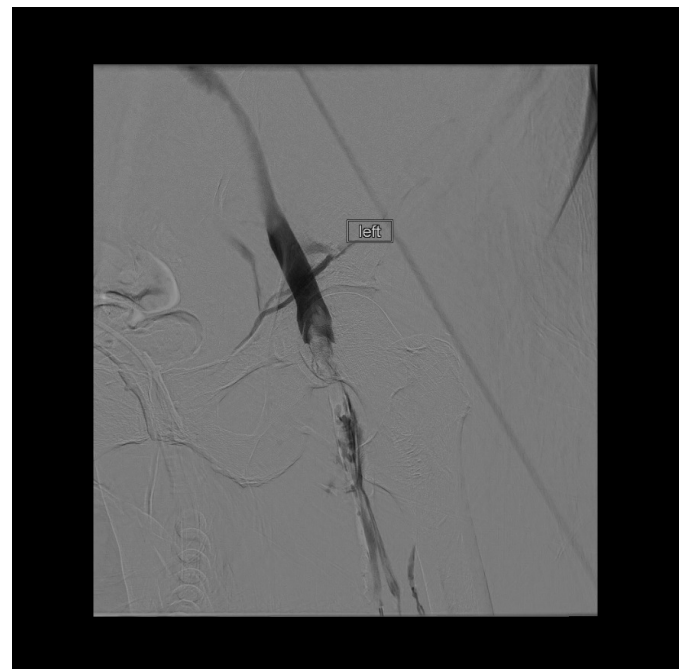


- A: IVUS of the IVC demonstrating luminal compression
- B: IVUS of the over riding right common iliac artery demonstrating significant compression of the left common iliac vein
- C: IVUS of the left external iliac artery crossing the thrombosed left external iliac vein
- D: IVUS of the thrombosed left common iliac vein

IMAGE 1 | Panel 2



Left image demonstrates thrombosed left common femoral and femoral veins with poor flow proximally.



Right image demonstrates occlusion of the left common iliac vein with multiple pelvic collaterals.



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IMAGE 2



Post intervention after lysis, mechanical thrombectomy followed by balloon angioplasty and stenting. Brisk flow was noted through the venous system however the proximal extent of the Wall stent appeared to be compressed (arrow) despite repeated angioplasty and reinforcement with secondary Wall Stent.

IMAGE 3



CT Scan Abdomen Pelvis demonstrating large uterine mass with continued extrinsic compression of the Wall stents with compromise of the vessel lumen



Gyn Oncology was consulted for evaluation. Outpatient follow up was recommended. To Prevent loss of outflow failure of the Wall stents, we re-intervened by placing Cook Z stents to support the proximal aspect of the Wallstents at the IVC confluence. IVUS demonstrated significant improvement in diameter of the left iliac vein with no residual compression and brisk flow from her left lower extremity (Image 4).

Postoperatively her platelets had a sharp decline from 162 to 89. Heparin induced thrombocytopenia (HIT) was suspected. Her anticoagulation was transitioned from unfractionated heparin to Xarelto. Heparin antibodies were positive with an optical density of 1.789. Initially her swelling and discomfort improved, however on postoperative day five she developed worsening edema and pain in both extremities but no signs of phlegmasia cerulea dolens. Duplex now demonstrated acute occlusive thrombosis in bilateral common femoral veins, femoral veins, and popliteal veins.

It was unclear if this was the result of

continued compression of the IVC from her mass or a sequela of her HIT. We changed her anticoagulation to Argatroban and re-engaged GYN oncology. Once she was optimized, they proceeded with surgical resection. An IVC filter was placed for perioperative protection. The pathologic diagnosis was clear cell ovarian tumor and endometrial cancer with squamous features. Post operatively she did well and resumed Argatroban. Due to persistent swelling and discomfort limiting her ambulation and rehab we proceeded with reintervention.

Bilateral popliteal venous access was obtained. Venogram demonstrated thrombus extending from her femoral veins continuing up to her distal IVC and within the IVC filter. Bilateral with a Penumbra Cat 12 device yielded significant thrombus removal. Her IVC filter was retrieved from a jugular approach. Her right common iliac vein was stented with a Vici Boston Scientific venous stent up to the level of the caval confluence just below the Z stent. This was extended distally with a Wall stent into distal common

IMAGE 4 | Re-intervention after identifying extrinsic compression from large Uterine Mass



Left: Initial fluoroscopic image of the compressed Wall stent

Middle: After placement of the Cook Z Stent there is significant improvement in stent expansion.

Right: completion Venogram demonstrating Brisk flow with no residual stenosis.



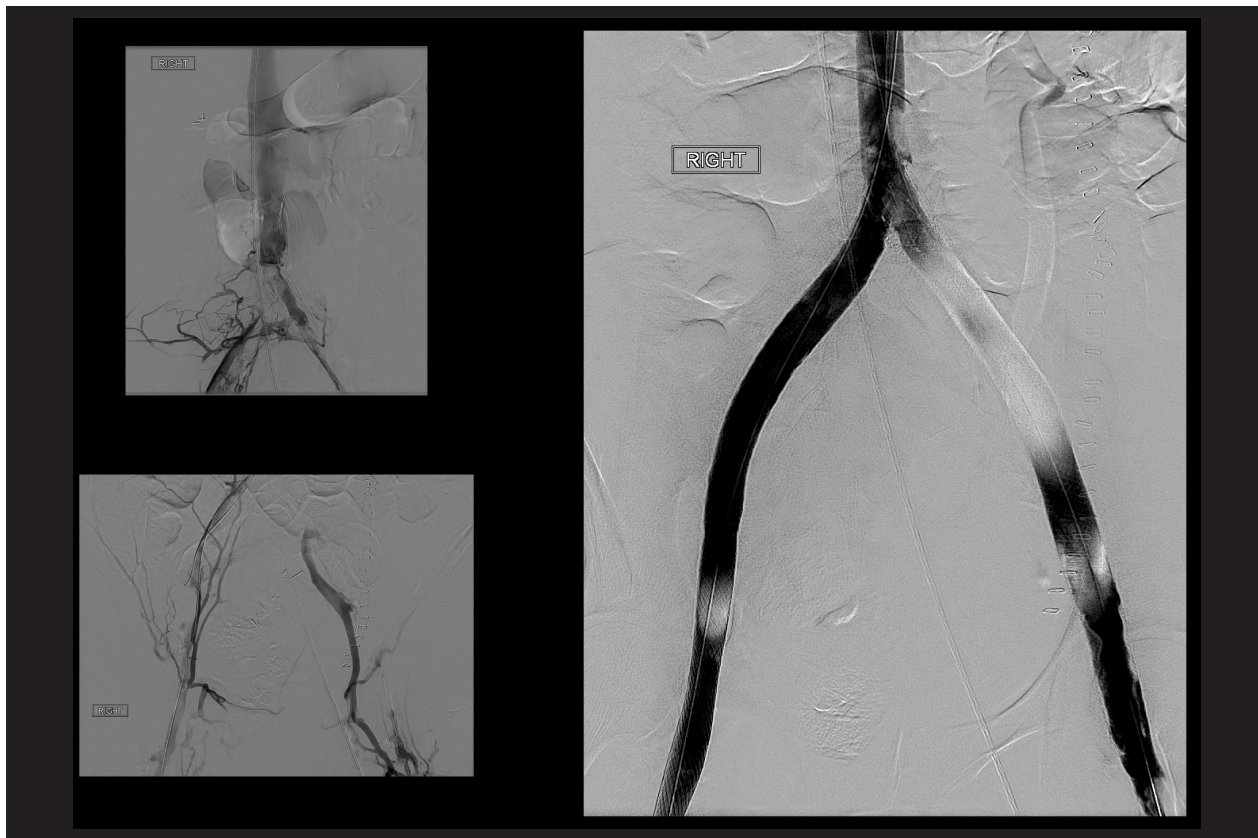
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femoral vein. The left common iliac vein was re-stented with a Vici stent proximally and extended distally with a Wall stent. Completion venogram and IVUS demonstrated brisk flow through bilateral lower extremities with no residual stenosis (Image 5). She subsequently did well with improvement in her lower extremity symptoms and was eventually discharged to inpatient rehab on Eliquis.

This was obviously a case where the patient encountered several different setbacks including the diagnosis of a GYN malignancy as well as HIT after our initial intervention. The main point of this case is to be mindful of other forms of external compression in patients in this age group. Clearly if we had known this to be the case before the initial venous interventions,

we would have deferred therapy until after the mass had been removed. It is possible her mass continued to exert compression on the IVC proximally, contributing to her re-thrombosis. Additionally, her anticoagulation management during the acute HIT may have been a factor. The American Hematology Society 2018 guidelines for management of HIT includes direct oral anticoagulants as an appropriate treatment for acute HIT but in the setting of other risk factors such as malignancy and extrinsic proximal venous compression intravenous anticoagulant therapy may result in more reliable outcomes.

IMAGE 5 | Final intervention after repeated thrombotic event.



Left: Initial Venogram demonstrating thrombosis of the femoral, common femoral, iliac veins and distal IVC.

Right: Post mechanical thrombectomy, balloon angioplasty and stenting, completion Venogram demonstrating brisk flow through bilateral iliofemoral veins and distal IVC with no significant compression. Minimal residual thrombus in distal IVC.



Not a Happy Ending

–Nikita Singh, BS, and Anil Hingorani, MD

A 64-year-old man presented to the emergency department with complaints of pleuritic chest pain, subacute cough, and a three-day history of hemoptysis. His medical history was significant for asthma, human immunodeficiency virus, and hepatitis C. The patient was a former chronic smoker and had a past history of intravenous heroin use. On admission, the patient was hypoxic, tachycardic, normotensive, and in normal sinus rhythm. Initial labs were remarkable only for a mild leukocytosis. A computer tomography pulmonary angiogram (CTPA) was obtained for concern of pulmonary embolism (PE). Imaging revealed saddle, bilateral segmental, and subsegmental pulmonary emboli with right heart strain, consistent with submassive PE. He was also found to have bilateral pleural effusions and a left lower lobe pneumonia. Initial management included aspirin load, heparin drip, duonebs, broad spectrum antibiotics, and fluids.

Four hours after the CTPA results, the pulmonary embolism response team was mobilized. The patient was intubated and brought to the operating room. Intravascular intervention was planned through the right common femoral vein and with a placement of bilateral EKOS catheters. However, when the guidewire was placed into the right pulmonary artery (PA), the patient became tachycardic to 130 beats per minute. The wire was removed from the right atrium and the patient's heart rate increased to 140 beats per minute. Anesthesia treated the patient with 10 mg of esmolol and asystole resulted.

Advanced cardiac life support (ACLS) protocol followed, with return of spontaneous circulation (ROSC) after two minutes. The right PA was recannulated and bilateral EKOS ultrasound guided catheter were placed. The patient developed an asystole rhythm three more times, each time with ROSC after a brief period of ACLS. The patient was transferred to the medical intensive care unit (MICU) on three pressors and another episode of asystole with rapid ROSC occurred.

The next day, the patient was found to have an acute left popliteal deep vein thrombosis on duplex. A transthoracic echocardiogram was obtained and revealed normal left ventricular function (ejection fraction of 65%) and the right ventricle displayed mild hypokinesis and severe dilation, indicating profound right-sided heart strain. The EKOS catheters were removed after 24 hours and the patient was improving.



– Nikita Singh, BS



– Anil Hingorani, MD



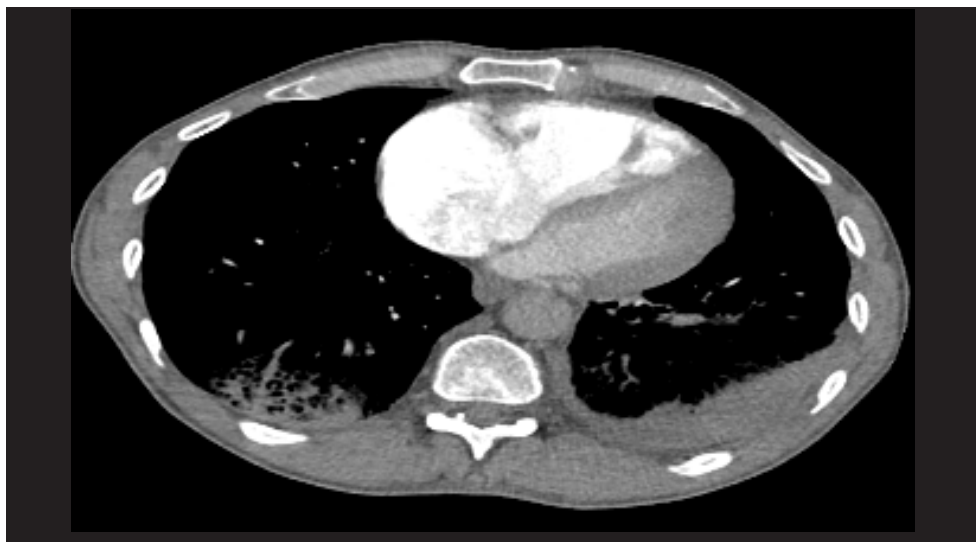
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FIGURE 1



CTPA: Extensive bilateral pulmonary emboli initiating from the distal interlobar PA into the segmental and subsegmental arteries.

FIGURE 2



CTPA: Evidence of right heart strain with a RV to LV ratio of 1.6.

The patient's MICU course in the MICU was complicated by acute renal failure managed with continuous renal replacement therapy (CRRT). On hospital day seven, the patient displayed significant improvement in his volume status and renal function, and CRRT was stopped. However, the next day, the patient began to develop new signs of sepsis. At this time, a goal of care discussion was had with the patient's family. The family decided to withdraw care, including antibiotics, pressors, and mechanical ventilation. The patient expired on hospital day eight.

Upon review, this patient experienced a delay in treatment. With the clinical deterioration from a submassive PE to a possibly massive PE, would a thrombectomy with the Penumbra device or the Flowtreiver have been helpful? Neither of these

were available at this institution during this time period. Since we do not have cardiac surgery at our site, a pulmonary embolectomy would have required a transfer which may have posed a risk in this patient. Finally, the withdrawal of support with palliative care while the patient seemed to be improving clinically needs to be questioned in the present era of liberal consultation of palliative care services. While there is clearly a role for these consultations, has the pendulum swung too far to end supportive measures in some salvageable patients?



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When May Thurner Syndrome and Peripheral Artery Disease Coexist

–Windsor Ting, MD
Mount Sinai Medical Center, New York

Approximately 6.5 million individuals age 40 and older in the US have peripheral artery disease (PAD)¹. The precise incidence of proximal iliofemoral venous outflow obstruction (PVOO) of which May Thurner Syndrome is the most well known and most common is not as well documented. It is reasonable to suggest that some patients may have both conditions. How does PAD affect PVOO or vice versa? Can one proceed with vein stenting when the patient has significant PAD?

The case of Patient GC provides some insights.

This is a 77 year-old man with hypertension and diabetes who was referred to me for evaluation of 2-block claudication present in both calves. On physical exam, pedal pulses were absent bilaterally, the left foot was cool compared to the right foot. His right ABI was 0.54, left 0.57. CT angiogram showed occlusion of the left popliteal artery (Figure 1) and in the right side, severe infra-popliteal atherosclerotic occlusions. Conservative management of his PAD was recommended. On further questioning, he also reported edema in the right leg and sensation of fullness and tiredness in both. An ultrasound showed no superficial venous disease or evidence of chronic DVT. MR venogram showed compression of his right common iliac vein. Venogram and IVUS were subsequently performed showing severe bilateral iliac stenosis (Figure 2). This was treated with two 16 mm x 120 mm Bard Venovo stents placed in the right and left common iliac veins and external iliac veins. At one-month follow-up, the right leg edema and the 2-block claudication have both resolved in GC.

There are several take home messages from this case. PAD and PVOO can coexist in the same patient. The presence of asymptomatic PAD and those with claudication likely do not contraindicate a venous intervention. PVOO and PAD share some similar symptoms and are difficult to differentiate. The overall incidence of both conditions coexisting in the same individual is likely low as reflected in about 20 patients



– Windsor Ting, MD

with both conditions among over a thousand patients whom we have stented for chronic PVOO. While these 20 patients like GC had arterial claudication based on abnormal ABI and CT angiogram, whether these individuals might in fact have “venous claudication” could not be ruled out. Interestingly, we have observed resolution of the claudication after vein stent placement. We had not performed both arterial and venous interventions at the same sitting as claudication was the predominant PAD symptom. In several patients we had performed a diagnostic angiogram in conjunction with their vein stenting procedure. In conclusion, when a patient is referred with PAD, do not overlook the possible presence of PVOO.

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FIGURE 1

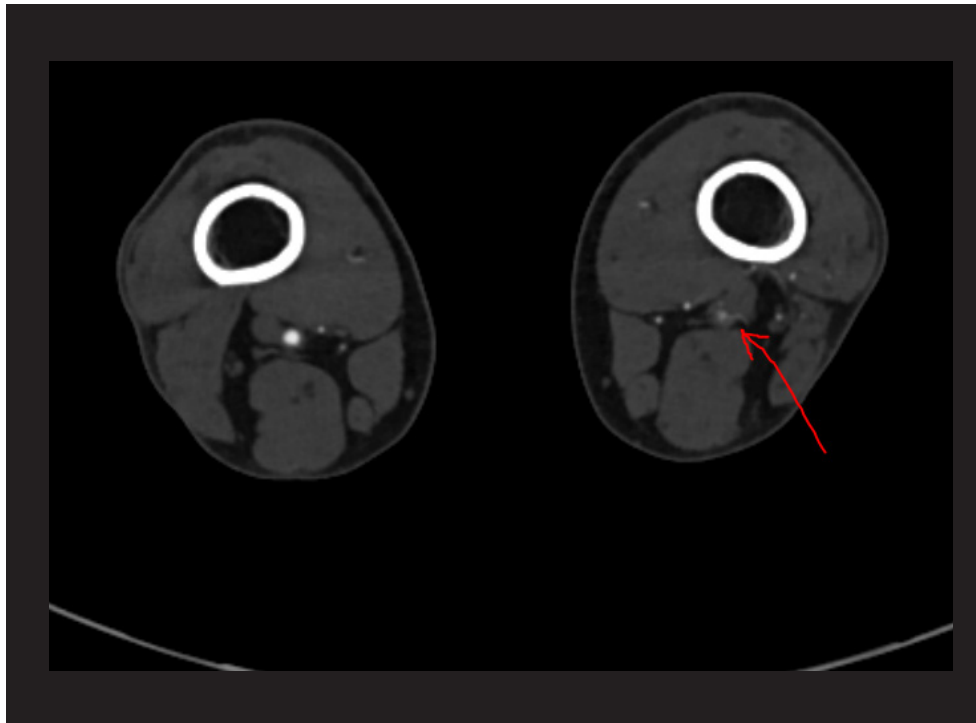
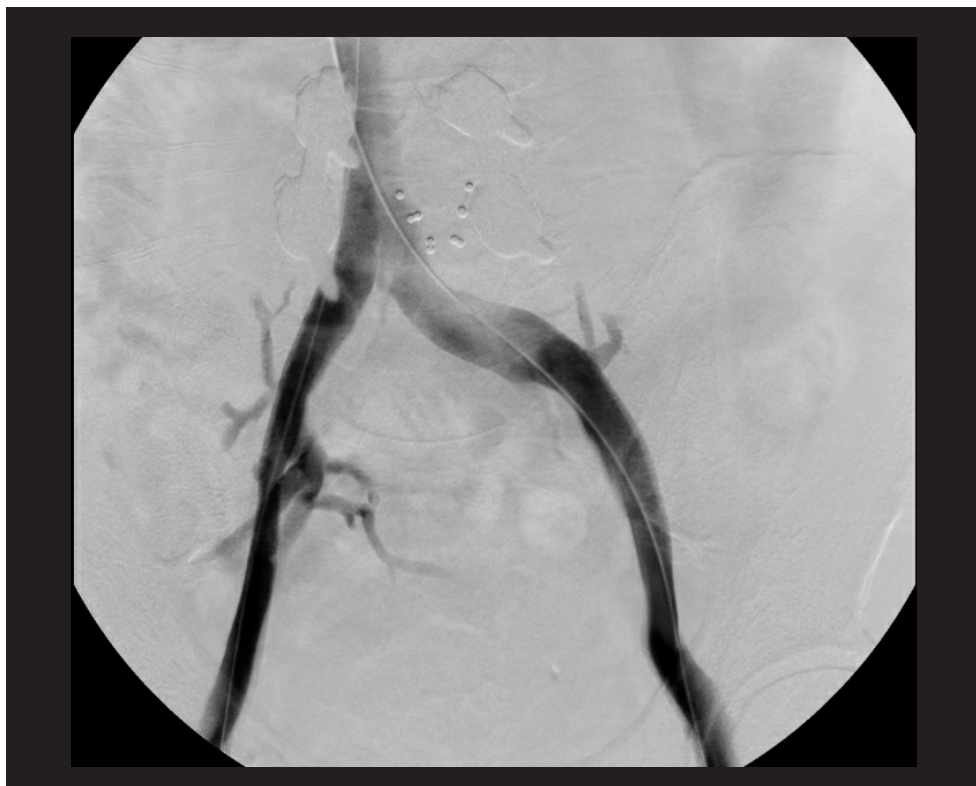


FIGURE 2



Pregnant, Thrombosed and Hypercoagulable

–Edgar Guzman, MD, FACS

Orlando Health Heart and Vascular Institute

–Julio Hajdenberg, MD

Orlando Health UF Health Cancer Center

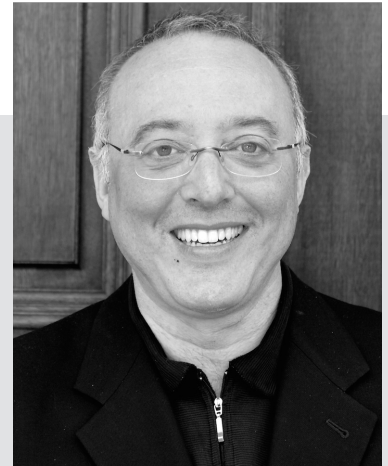
A 33 year old G3P2 female presented to our hospital with a 14 week gestation and an acute, highly symptomatic left lower extremity DVT, extending from the external iliac vein to the popliteal vein. Her prior pregnancies had been uneventful. Her past medical history was remarkable for chronic hepatitis B infection.

The patient was a former smoker and consumed 4-6 cigarettes until week 10 of her current pregnancy. On week 9 she developed a right sided iliofemoral DVT and was treated at an outside hospital with percutaneous thrombectomy without stenting and started on low molecular weight heparin (LMWH). At the time, involvement of the inferior vena cava was noted.

She had initial improvement but developed recurrent right leg pain and swelling on week 11 of her



– Edgar Guzman, MD, FACS



– Julio Hajdenberg, MD

FIGURE 1

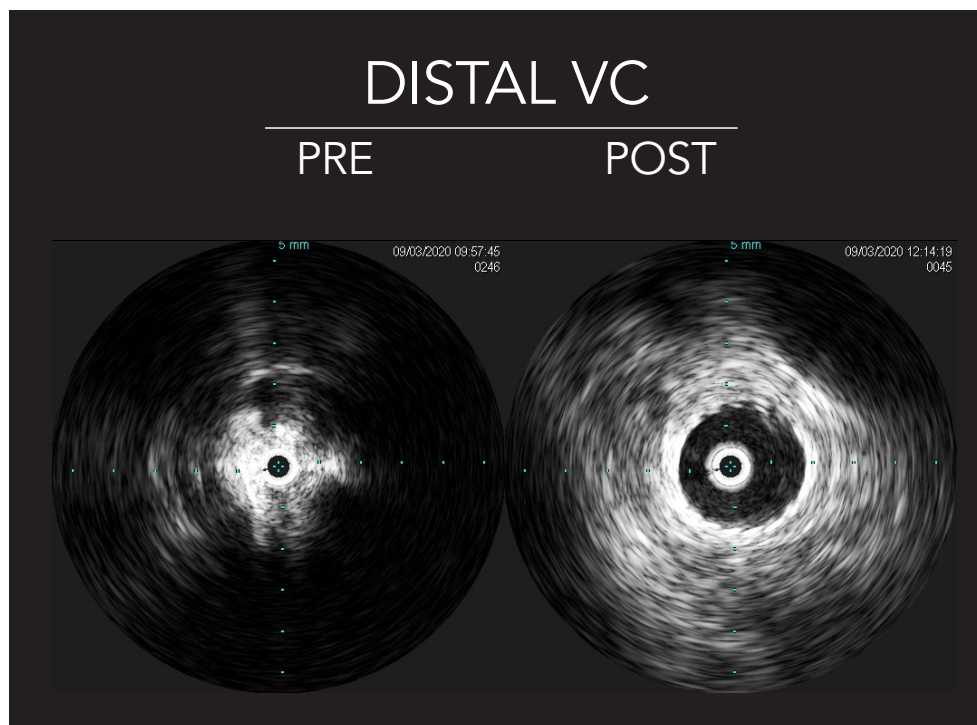


Thrombectomy aspirate



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FIGURE 2



Intravascular ultrasound of distal inferior vena cava before and after intervention.

pregnancy. She was shown to have a recurrent right iliofemoral venous thrombosis and thrombocytopenia that progressed despite a change of anticoagulation to fondaparinux.

A diagnosis heparin induced thrombocytopenia and thrombosis (HITT) was made and supported by the presence anti heparin-PF4 antibodies by ELISA assay and a confirmatory serotonin release assay. Anticoagulation was switched to parenteral argatroban.

During the week prior to her admission to our institution she noted a tendency for swelling and heaviness to the right leg, which was soon eclipsed by severe swelling and pain to the left lower extremity. Her workup also disclosed significant post thrombotic lesions throughout the right common femoral to popliteal veins. Her platelet count was normal.

We suspected that unaddressed inferior vena cava thrombosis or post thrombotic stenosis was the root cause for her right sided recurrence and new left sided thrombosis. Under this premise we explained left sided intervention alone could yield suboptimal IVC inflow and fail to address her right lower extremity, with potential to make this more

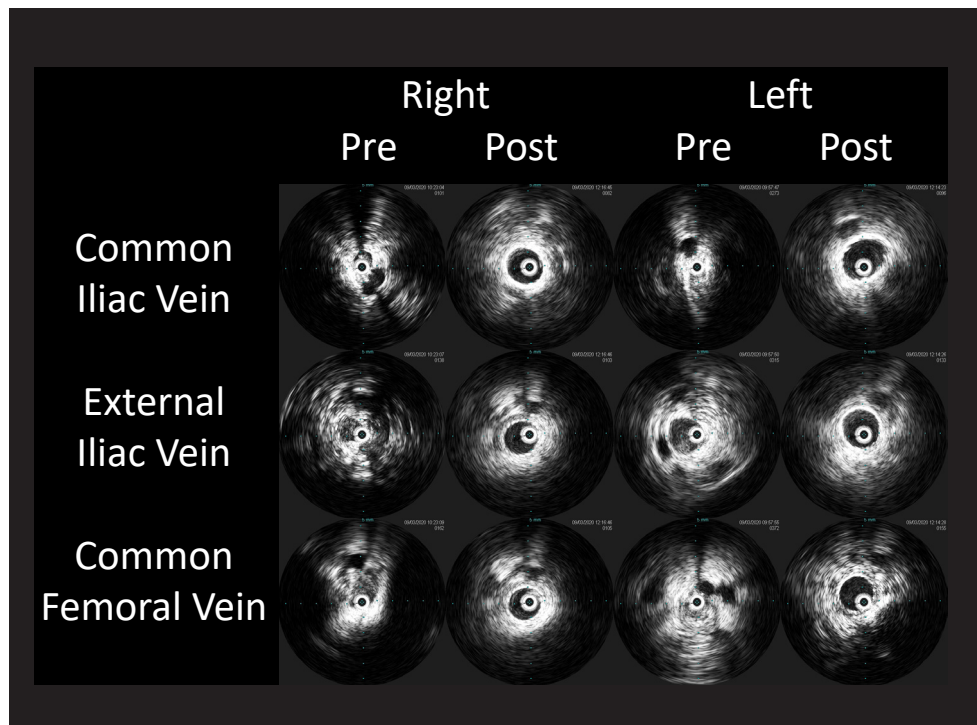
challenging in the future. Therefore we discussed IVC and bilateral iliofemoral thrombectomy and reconstruction as the most likely surgical plan.

It was clear that competing goals were at stake. Symptom improvement and mitigation of post thrombotic syndrome would be best achieved by intervention. In contrast, reduction of risk to the fetus as well as avoidance of pulmonary embolism and further thrombotic events would be favored by anticoagulation alone. The patient chose the former.

Given her pregnant status, bilaterality and sub-acute time frame for the right sided thrombosis I elected percutaneous thrombectomy over thrombolysis. Low dose fluoroscopy settings, positioning, collimation and reduction of DSA runs were used to minimize radiation exposure. IVUS was used to guide the majority of the intervention. With these measures, the calculated fetal radiation dose was 62 mGy, well below the 500 mGy dose threshold for fetal harm at this gestational age.

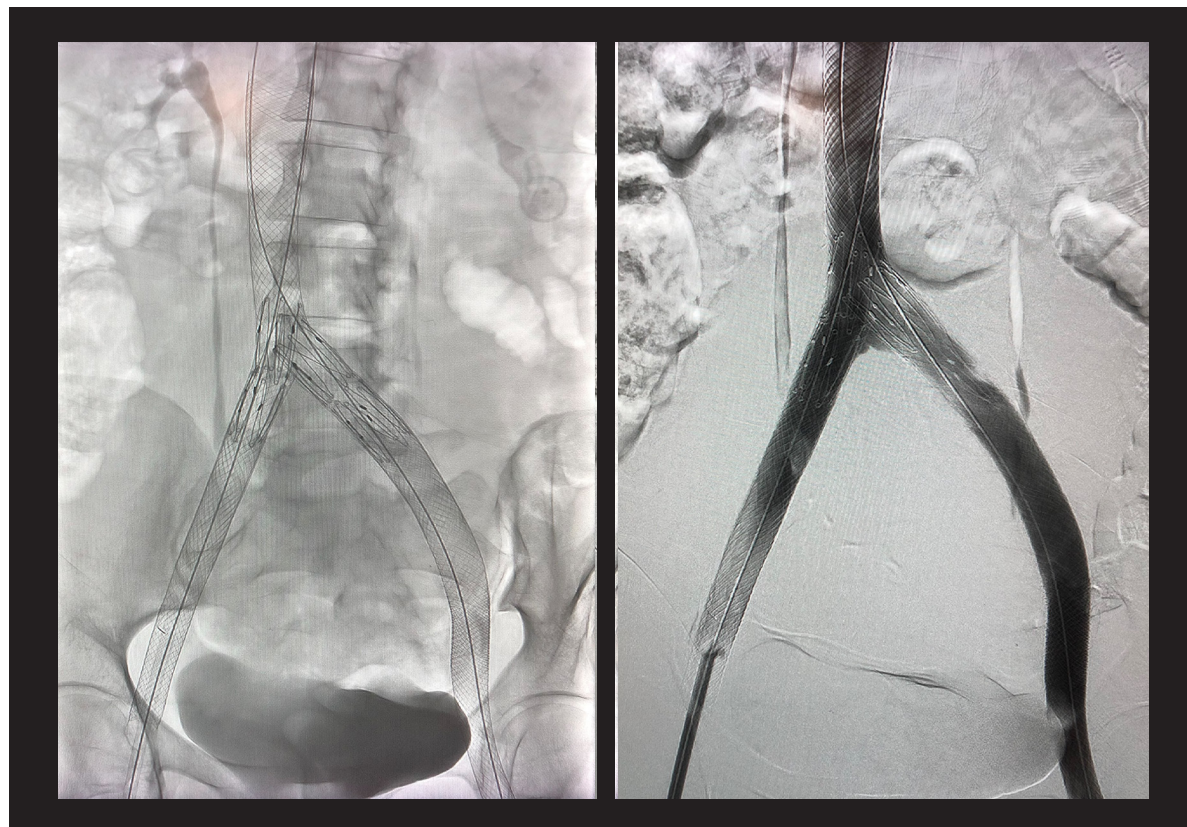


FIGURE 3



Intravascular ultrasound of bilateral iliofemoral segments before and after intervention.

FIGURE 4



Stent configuration and final flow pattern.



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The calculated risk of childhood cancer was between 0.22 and 0.36%, which is equal to that of the general population.

The patient was approached from both femoral veins under general anesthesia during week 15 of her pregnancy. Findings were as expected; acute thrombosis of the left iliofemoral segment and severe post thrombotic changes on the right, with focal areas of occlusion. The distal IVC was severely narrowed and fibrosed. The initial flow pattern was that of right to left cross-pelvic shunting with left lumbar outflow due to IVC compromise.

Thrombectomy with a Penumbra CAT 12 device yielded removal of most of the acute thrombus as well as a significant part of the more chronic burden (Figure 1). Wallstents were used for the IVC and iliofemoral segments (Figures 2 & 3). The IVC bifurcation was reconstructed using Cook Gianturco Z stents (Figure 4).

Postoperatively the patient experienced rapid improvement of her lower extremity symptoms but did complain of low back pain, likely related to chronic outward force from the stents. She was discharged on apixaban without observed obstetric complications.

Collaboration with the Hematology and Obstetric services was fundamental to assist the patient in understanding her treatment options and risks, as well as to ensure adequate anticoagulation and perinatal management.

The Hematology service had extensive

discussions with the patient regarding outpatient anticoagulation during the 2nd trimester of pregnancy. Information about the risks of warfarin utilization was presented, emphasizing lesser risks at this stage, especially if the dose is kept at 5mg or less. This risk assessment was informed by the experience of women who continued taking warfarin during pregnancy for mechanical heart valves and could not be transitioned to heparin or LMWH.

Because the patient adamantly declined to use warfarin, information about DOACs in pregnancy was presented. DOACs are considered acceptable by the American Society of Hematology 2018 guidelines for the treatment of HIT. However, most of the information about using DOACs in pregnancy is related to animal studies (rivaroxaban) or is simply nonexistent (apixaban). In the end, after in depth conversations and counseling, the patient opted for treatment with apixaban, with the understanding that we were unsure of its possible deleterious effects on the pregnancy, delivery or the fetus. Follow up was arranged with a hematologist specialized in the management of complications of pregnancy.

From a technical perspective, this case reinforces the importance of addressing the inferior vena cava when compromised and highlights the efficacy of radiation reduction techniques during pregnancy.



Uterine Fibroid – An Uncommon Etiology of May-Thurner Syndrome

–Eric Hager, MD

Case:

A 43-year-old female presented to the emergency department at an outside hospital complaining of left leg pain and edema that began three days prior. She denied chest pain, shortness of breath, and had no other systemic symptoms. Her chest computed tomography angiography (CTA) indicated small bilateral pulmonary emboli (PE) and her echo showed no right heart strain. Lower extremity duplex ultrasound revealed extensive thrombosis in the left common femoral, femoral, popliteal, peroneal, and posterior tibial veins.

She was deemed a candidate for iliofemoral lysis given her young age, presumed duration of the DVT and severity of ongoing symptoms. Given the presence of the significant pulmonary clot burden we placed an inferior vena cava filter (IVCF) via internal jugular approach and initiated lysis via left popliteal approach. She underwent lysis for 24 hours which resulted in resolution of the femoral and iliac vein thrombus. We interrogated the left common iliac vein with intravascular ultrasound (IVUS) and discovered extrinsic LCIV compression and intraluminal synechiae, suggesting acute on chronic thrombosis. The decision was made to place a 14 mm by 12 cm VICI stent (Boston Scientific, Marlborough, MA, USA) that was post dilated with good results. The IVCF was not removed because of a moderate amount of thrombus within the cone.

The patient was discharged in stable condition seven days after admission on a three-month course of anticoagulation. She was seen two weeks later with a duplex confirming patency of the LCIV stent. During the examination, an astute ultrasound technician noted a 6.7cm x 7cm vascular mass compressing the vein and stent (Figure 1). Physical examination demonstrated minimal leg edema and a non-tender mass along the anterior abdominal wall. A contrast-enhanced computed tomography scan was then performed two days later revealed a large multi-fibroid uterus with an

exophytic 8.4 cm fibroid on the dome of the fundus compressing the LCIV and stent (Figure 2).

There are few case reports on secondary MTS from benign gynecological etiologies and current literature lacks clear guidelines for the long-term management of the MTS. Suggestions include long term anticoagulation and gynecology referral for potential hysterectomy or myomectomy (1,2). Patients that continue to have symptoms should have the left iliac vein evaluated and may require stenting.

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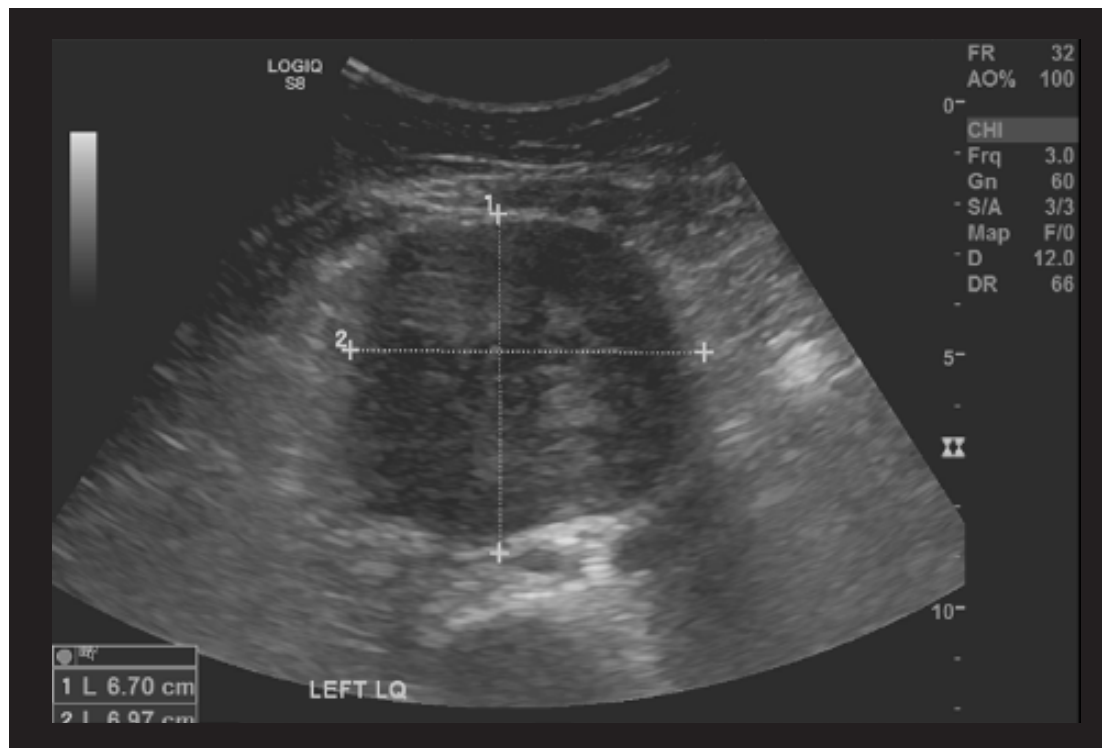


– Eric Hager, MD



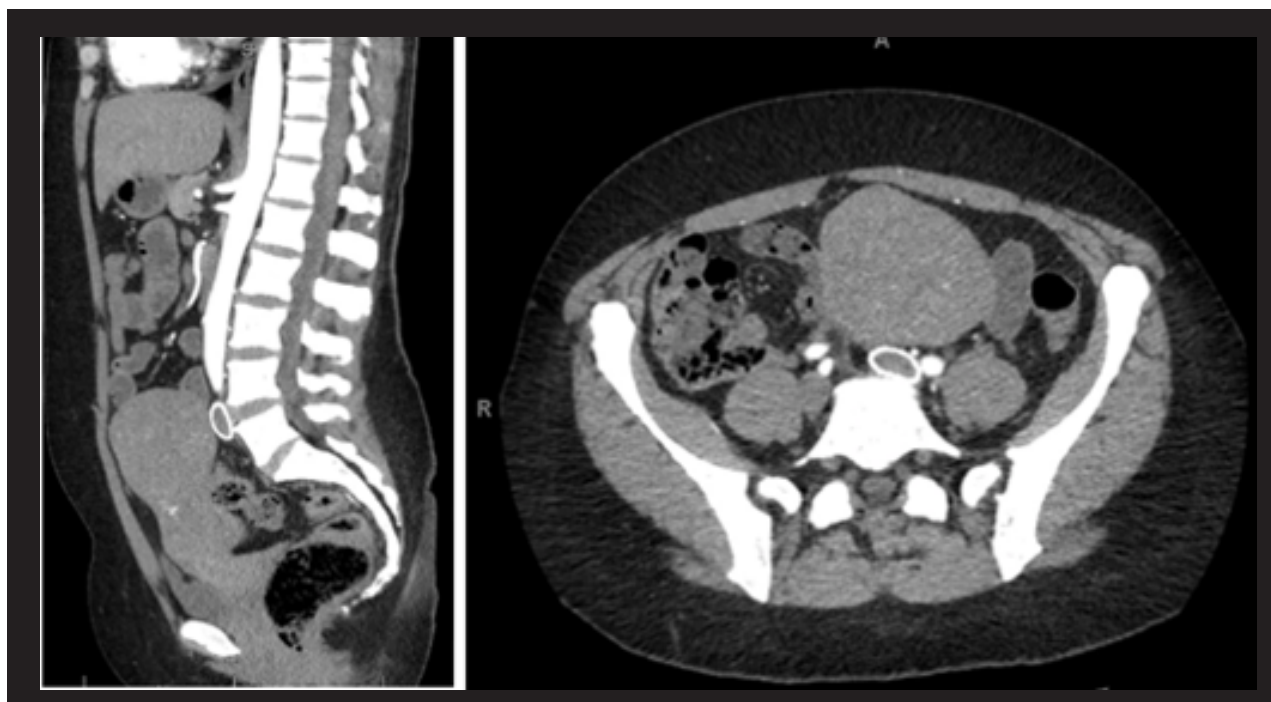
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FIGURE 1



Abdominal duplex ultrasound demonstrating a large vascular mass in the left lower quadrant.

FIGURE 2



Sagittal and axial arterial phase contrast-enhanced CT demonstrating compression of the LCIV stent between a uterine fibroid and the lumbar vertebrae.



A New Use for an Old Bypass

–Andrea Obi, MD

Assistant Professor, University of Michigan

A 60-year-old man with a past medical history of coronary artery disease, diabetes mellitus and morbid obesity (BMI 52) presented to his cardiologist with complaints of left lower extremity neurologic dysfunction on his left leg, primarily sensory loss on his medial thigh down to his foot. A venous reflux study was negative. Cross-sectional imaging demonstrated a large mass in his left thigh, encasing the superficial femoral artery, vein and nerve. He underwent an open biopsy of the mass. The pathology returned grade III leiomyosarcoma. He was referred to our multidisciplinary tumor board, where wide local excision of the remaining 17x5x8cm mass (Figure 1) followed by radiation was recommended. Pre-operative vein mapping revealed adequate GSV bilaterally and no evidence of DVT.

The patient was then taken to the operating room where the tumor was found to be encasing both the artery and vein 360 degrees through the majority of the thigh. Proximal control was obtained at the superficial femoral artery and vein and the below knee popliteal artery and vein. The tumor was resected en masse with a wide local margin. Contralateral GSV was harvested and reversed for a long arterial interposition from the proximal SFA to above knee popliteal, with anastomosis at the adductor hiatus. Given the smaller remaining length and diameter of remaining contralateral GSV, the ipsilateral GSV was mobilized from the junction to the knee. It was transposed sub sartorially. The saphenofemoral junction was left intact and the vein was divided at the knee, ligated distally, spatulated proximally and anastomosed end to end to the above knee popliteal vein. Systemic heparinization was reversed with protamine. The large defect was closed with a vastus medialis and sartorius muscle flaps and local tissue rearrangement.

Post-operatively sequential compression devices were kept on at all times and subcutaneous enoxaparin DVT prophylaxis were administered for protection of the venous bypass. Systemic anticoagulation was deferred for 72 hours given the bleeding risk with large defect and subsequent reconstruction. Aspirin 81mg was administered for prophylaxis of the arterial bypass. At 72 hours

anticoagulation with heparin infusion was administered and after 24 hours the patient was discharged on therapeutic dose of apixaban. He initially did well, discharging on post-operative day four. However, four months after the index operation he presented to the emergency room with cellulitis, fevers and pain over the medial thigh. He was found to have a 5.5cm x 3.5cm abscess, which was ultimately treated with IV antibiotics and percutaneous drainage. He recovered and was discharged on oral antibiotics. He is now 2.5 years post operation with ABI's of 1.0 bilaterally and no evidence of stenosis at his veno-venous bypass (Figure 2). He now undergoes routine surveillance yearly with ABIs, TBIs and arterial and venous graft duplex.

Saphenopopliteal transposition was first described by Drs. Richard Warren and Theodore Thayer in 1954 for treatment of post-phlebitic syndrome.¹ In their description of 14 patients, half underwent GSV transposition to the muscular compartment of the thigh without anastomosis and half with anastomosis and surgical interruption of both veins. The results were promising with 71% of patients experiencing clinical improvement, although



– Andrea Obi, MD

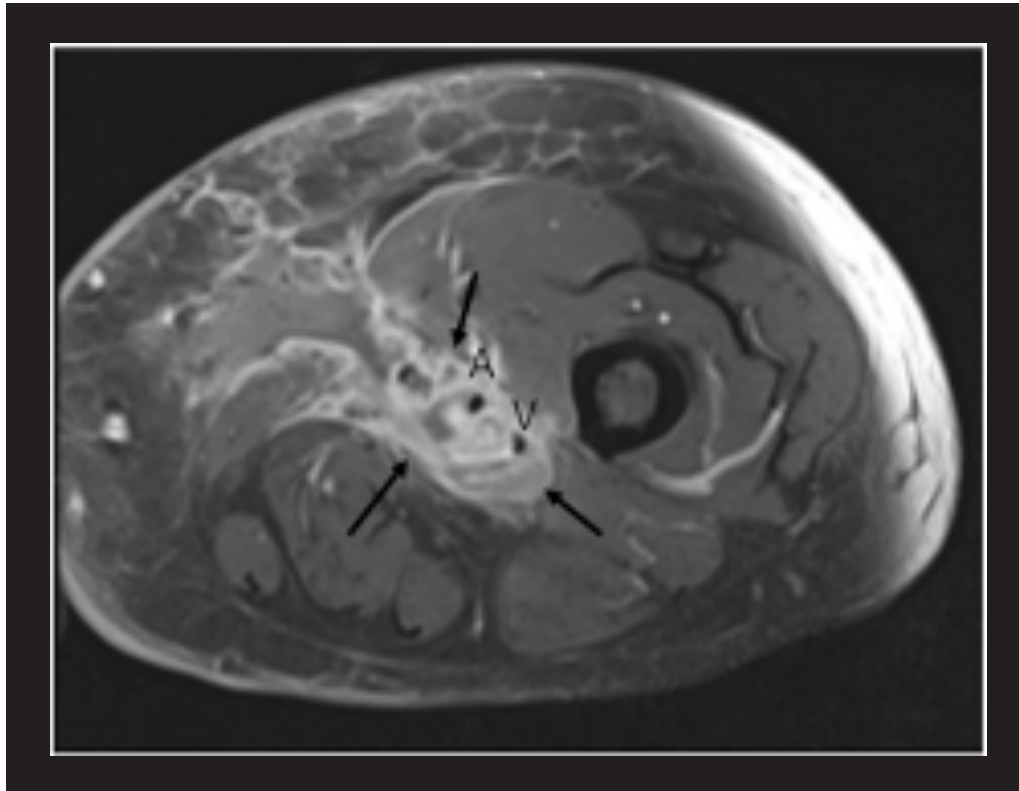


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none were cured, and the procedure failed to gain popularity. This technique was further modified in the 1970s and has been associated with the pioneering surgeons as the May-Husni procedure.² To date, 11 case series have been published, the largest comprised of 100 patients, with clinical improvement described in 42-100%

of patients.³⁻⁵ Indications for this procedure are largely relief of venous hypertension, claudication, and/or ulceration from femoral vein obstruction, although as our case clearly shows, it should be considered a viable option in the setting of reconstruction for cancer.

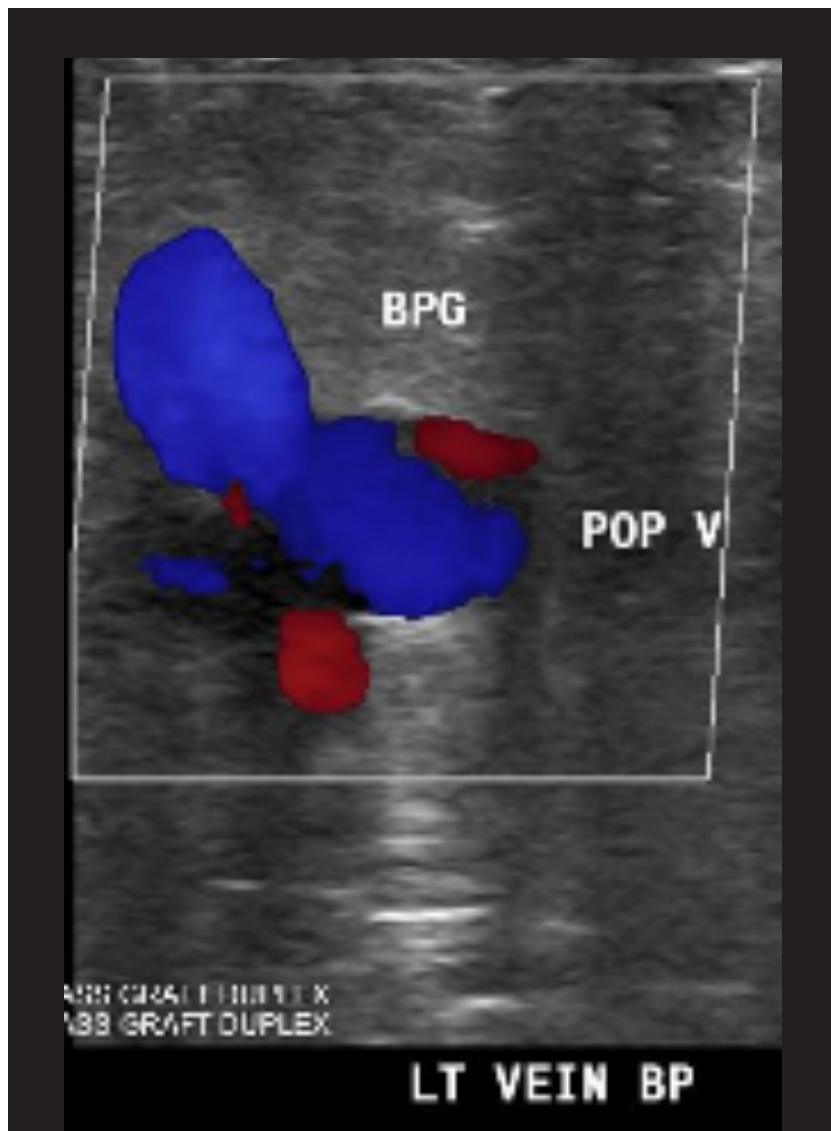
FIGURE 1



MRI showing encasement of neurovascular bundle by leiomyosarcoma. A denotes artery, V vein, arrows tumor edges.



FIGURE 2



Duplex of end-to-end veno-venous bypass at year 2 post-operative.

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Artery, Vein and Bladder: A Bad Combination

–Haraldur Bjarnason, MD

A 69-year-old gentleman presented to the vascular clinic with a one-month history of abrupt left leg swelling without pain or sense of heaviness. He presented no other symptoms, procedures, or other associated events. The patient was otherwise very healthy. Physical examination revealed 3/3 pitting edema from the ankle to the thigh of the left lower extremity. No swelling on the right side. He had been using medical grade knee high elastic stockings for a month with some improvement. Venous ultrasound of the lower extremities was normal and there were no other explanations for his swelling such as heart failure or sleep apneas. The laboratory evaluation was normal. A left lower extremity venous ultrasound demonstrated competent and open deep venous system (not DVT). A venous incompetency ultrasound study demonstrated severe incompetence of the left saphenofemoral junction and thigh segment of the great saphenous vein. Other tested superficial vein segments were competent. A computer tomogram of the abdomen and pelvis demonstrated tortuous iliac arteries and aorta with compression of the distal inferior vena cava and bilateral common iliac veins by the large bladder and the right common iliac artery.



– Haraldur Bjarnason, MD

FIGURE 1



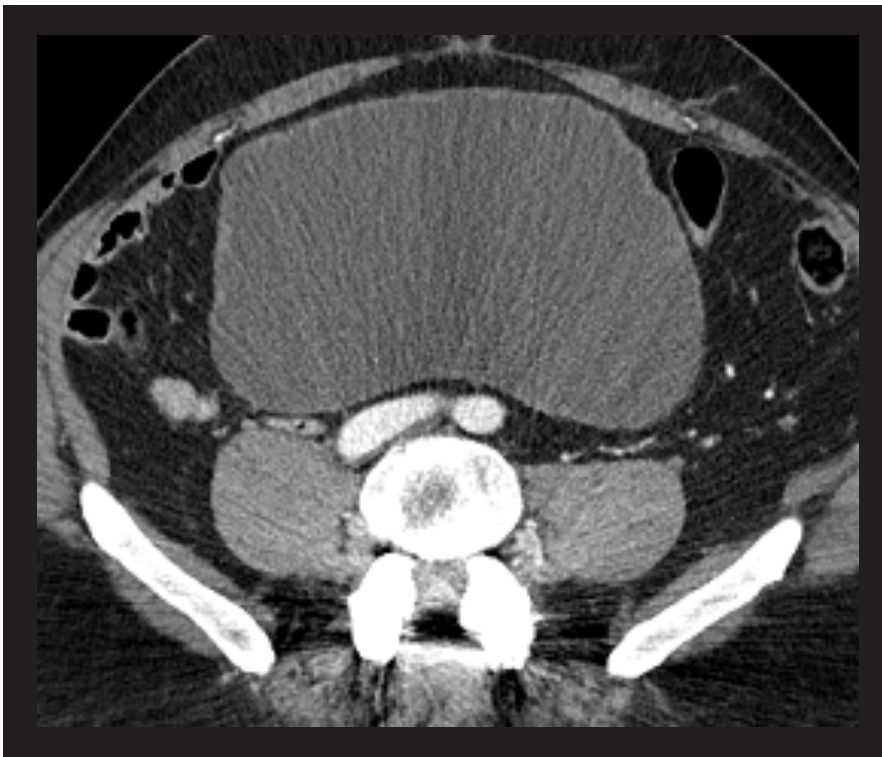
Axial slide showing the aorta to the left * and the “pancaked” IVC behind the large urinary bladder.



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The left common iliac artery also compressed the left common iliac vein. The urinary bladder was noted to be large and extended up along the anterior border of the inferior vena cava. Venography with potential stent placement was considered. A urology consult was requested, and this revealed a residual bladder volume of 483 ml on top of a total voided volume of 770 ml. The patient was instructed to perform self-catheterization four times a day. He was seen in the clinic one week later. By then, the left lower extremity leg swelling had improved significantly, and all but disappeared. We did not obtain a CT scan after the patient started self-catheterization. It is still very likely that the compression by the arteries is still present to some degree, but one can draw the conclusion that the compression by the bladder when the patient is in prone position was contributing to the patients swelling. The patient is being evaluated for transurethral prostatic resection and we do not intend to evaluate the patient further for venous compression unless the swelling returns.

FIGURE 2



Axial CT slide further caudal than Figure 1. The IVC is flattened behind the right common iliac artery and the bladder.



FIGURE 3



Sagittal representation of the abdomen demonstrating the large bladder compressing the IVC (white arrow) above the right common iliac artery (black arrow).

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The AVF-Juzo Traveling Fellowship in Venous Disease is Now Accepting Applications

–Jeff Mendola, AVF Director of Mission Advancement

Beginning in 1997, and continuing for more than a decade, the American Venous Forum and SIGVARIS offered a Travelling Fellowship in Venous Disease for early career members of the AVF. This enabled future venous practitioners to learn from pioneers in the field and to begin their personal leadership journeys. Three of the first nine awardees have served as Presidents of the AVF, one is the President-Elect and another serves on the Board of Directors.

Under the leadership of Dr. Harold Welch, AVF President, and with the generous support of Juzo, the American Venous Forum Foundation is proud to announce that the AVF-Juzo Traveling Fellowship in Venous Disease is now accepting applications.

The 2021 Fellowship with \$12,000 in funded travel will be awarded at the AVF Annual Meeting in March of 2021. The selected candidate will have up to two years to complete his or her fellowship and will be required to present a summary of his or her experiences at a future AVF Annual Meeting. Recipients of prestigious award will benefit significantly from meeting with, and learning from, some of the brightest researchers, educators, and practitioners in the field of venous and lymphatic disease. They will enjoy access to AVF mentorship opportunities and will receive consideration for future committee and leadership roles within the AVF upon completion of their learning experience.



– Jeff Mendola



Eligibility | Applicants must:

- Have completed their training and been in practice for less than ten years
- Have been an AVF Member as of July 1, 2020
- Commit to maintaining their AVF membership for at least three years after the date of award
- Agree to submit requests for reimbursement within 60 days of incurring an eligible expense
- Agree to visit Juzo's corporate headquarters and manufacturing facility during the first 12 months of the Fellowship (these expenses will be covered by Juzo, separately from the \$12,000 award)
- Agree to present a summary of their experiences at a future AVF Annual Meeting

Application | Applicants should submit the following:

- An essay describing
- Their interest in venous disease; how it developed, current experience, and future goals
- How the Traveling Fellowship will serve them, their patients, their colleagues, and the AVF
- An outline of their potential travel plans as they relate to the goals of the applicant, and what they hope to learn from their visits.
- The AVF-Juzo Traveling Fellowship page on the AVF web site contains a list of venous and lymphatic experts willing to share their time, wisdom and expertise
- A copy of their CV
- Two letters of recommendation

Deadline | Submissions must be received no later than January 22, 2021.

All supporting documents should be attached in Word or PDF format. Submission, as well as any questions about the Traveling Fellowship, should be directed to Jeff Mendola, Director of Mission Advancement, at Jeff@VeinForum.org



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AVF Advocacy Corner

AVF Advocacy Alert – Dr. Mark Iafrati

The AVF Health Policy Committee, in collaboration with the SVS and AVLS have been busy advocating for our patients and our members.

Earlier this month, we submitted comment letters to CMS (Centers for Medicare and Medicaid Services) to address several significant regulatory issues.

The first addresses a long-standing non-coverage decision regarding catheter based mechanical embolectomy for Pulmonary Embolism.

The second addresses a proposed severe further reduction in the reimbursement for radiofrequency ablations over the next two years, based on an erroneous assumption about the prices we pay for RFA catheters.

By raising our collective voices on these important issues, we hope push our agenda of educating the regulators and ensuring access to these vital services for our Medicare and Medicaid patients.

Please take a moment to review these letters and feel free to add your voice with direct communication to your legislators in support of these important issues.

[Comment Letter to Medicare and Medicaid Services](#)

[October 5th Proposed Rule Comments](#)

[Vein Ablation Policy Updates](#)



– Mark Iafrati, MD

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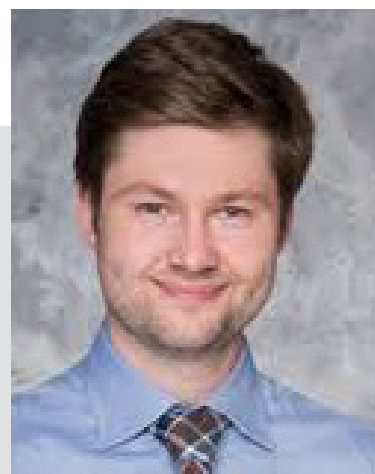
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AVF Member Community

Congratulations

Dr. Maxim Shaydakov, AVF member and recipient of the 2016 AVF-JOBST Research Grant, has submitted his results to the JVS-VL and they have been accepted for publication.

A short version has been posted online at
<https://www.sciencedirect.com/science/article/abs/pii/S2213333X20304625>.



– Maxim Shaydakov, MD

New AVF Members – Welcome to the Community!

Aoi Ogawa	<i>Medical Student Member - Hawaii, U.S.</i>
Jose Ordenez	<i>Medical Student Member - Colombia</i>
Mohsin Chowdhury	<i>Member in Training, Massachusetts, U.S.</i>
Heepeel Chang	<i>Member in Training, New York, U.S.</i>
Joedd Biggs	<i>Member in Training, Minnesota, U.S.</i>
Andres Figueroa	<i>Member in Training, Colombia</i>
Lily Johnston	<i>Member in Training, Minnesota, U.S.</i>
Jessica Green	<i>Physician Membership - National, Hawaii, U.S.</i>
Brian Davison	<i>Physician Membership - National, Massachusetts, U.S.</i>
Rachel Anolik	<i>Physician Membership - National, Missouri, U.S.</i>
Kristyn Mannoia	<i>Physician Membership - National, U.S.</i>
Barry Zadeh	<i>Physician Membership - National, Ohio, U.S.</i>
Ulises Baltazar	<i>Physician Membership - National, Texas, U.S.</i>
Christina Boyd	<i>Physician Membership - National, California, U.S.</i>
Blaze Cook	<i>Physician Membership - National, Colorado, U.S.</i>
Samuel Goldhaber	<i>Physician Membership - National, Massachusetts, U.S.</i>
Brian Hoang	<i>Physician Membership - National, Arizona, U.S.</i>
Zack Nash	<i>Physician Membership - National, Texas, U.S.</i>
Chompunut Asavaaree	<i>Physician Membership - National, Ohio, U.S.</i>



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JOURNAL WATCH | Journal of the American College of Surgeons

Fibrinolysis Shutdown Correlation with Thromboembolic Events in Severe COVID-19 Infection

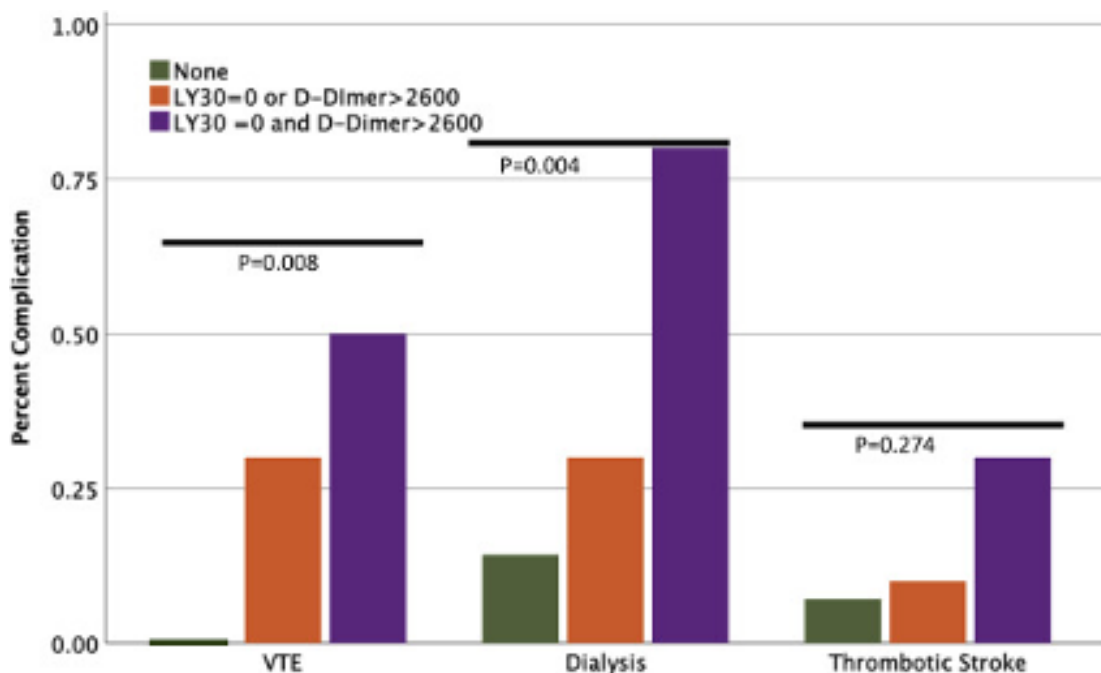
It is now widely accepted that severe COVID-19 infections constitute a pro-thrombotic state. Elevations in D-Dimer and fibrinogen confer a negative prognosis and suggest both increased inflammation and accelerated coagulation. However, these measurements render only partial information of the larger process taking place.

Thromboelastography (TEG) is a whole blood assay that provides a more holistic representation of coagulation. It offers metrics pertaining to the coagulation cascade leading to thrombin formation, fibrin generation, platelet aggregation and most pertinent to the current study: fibrinolysis.

The authors report a complete shutdown of fibrinolysis (as measured by degree of clot lysis at 30 minutes) in severe COVID-19 infections. In combination with D-Dimer levels >2600 ng/ml the lack of thrombus lysis was associated with a 50% chance of venous thromboembolism (VTE) and an 80% chance of requiring hemodialysis. In contrast, when neither of these markers was present, the risk of VTE was 0%, and that of hemodialysis 14%.

These findings highlight the importance of thrombus lysis in maintaining coagulation homeostasis and raise interesting questions regarding how COVID-19 infection may affect multiple facets of this mechanism. The results also render support to the practice of utilizing tPA to treat the most severe cases.

<https://www.journalacs.org/action/showPdf?pii=S1072-7515%2820%2930400-2>.



Combination score predicts venous thromboembolic event (VTE) and dialysis risk. LY30, clot lysis at 30 minutes.



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**Disclaimer: The information featured in this newsletter selected by AVF, which offers educational materials, are not intended to be representative of patients with venous disease generally and should not be considered medical advice. Patients should consult their doctor to determine the best treatment decision for their individual disease.*

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