

THE GOOD THE BAD THE UGLY

ILIOFEMORAL DVT

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DEEP VEIN THROMBOSIS
BLOOD CLOT

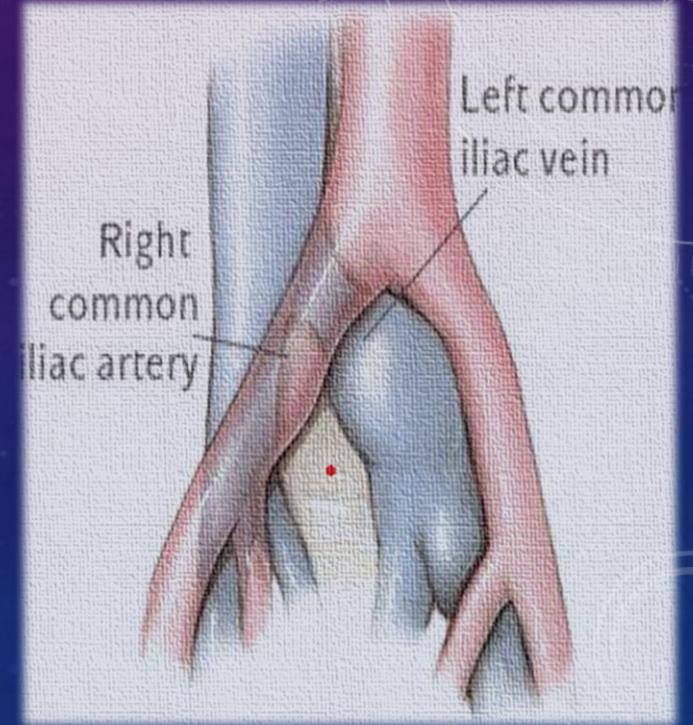
Cockett's Syndrome

Ilio-Caval Compression Syndrome

May-Thurner Syndrome

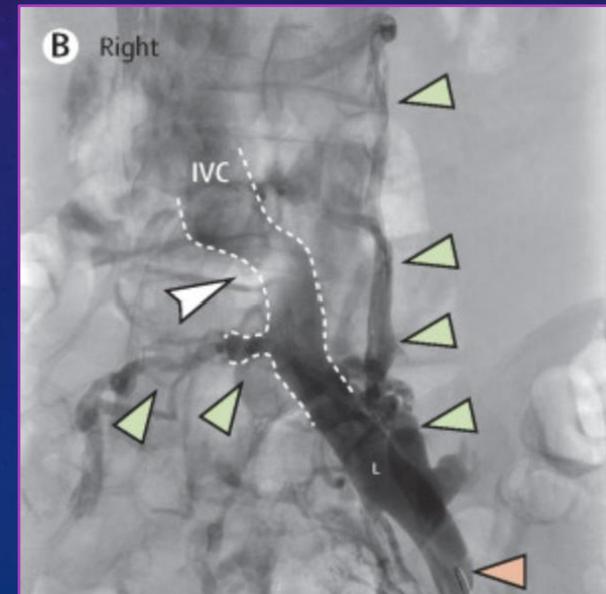
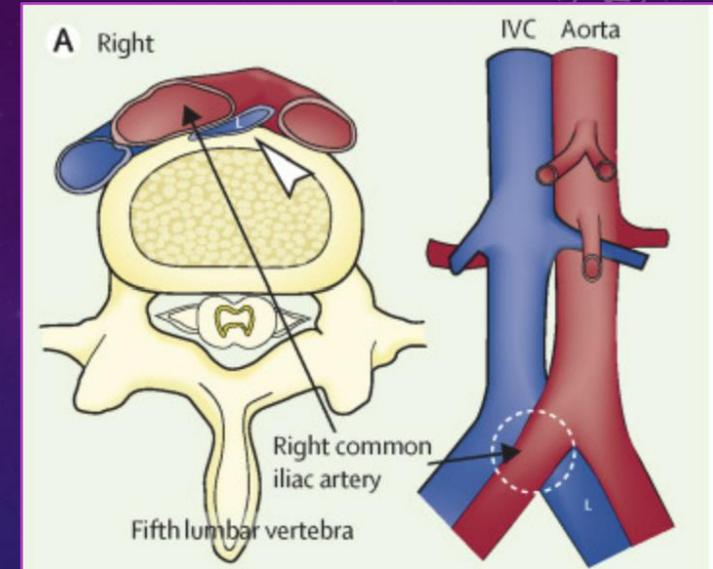
OBJECTIVES

- Identify the etiology of iliofemoral DVT or May-Thurner syndrome (MTS)
- Outline the appropriate evaluation of May-Thurner syndrome
- Examine Case Study
- Review the treatment and management options available for May-Thurner syndrome

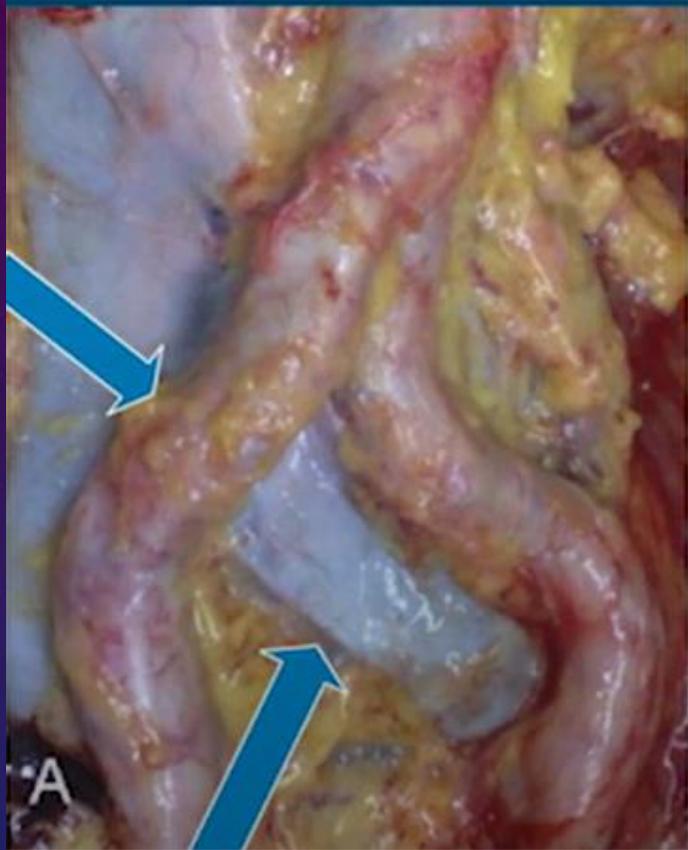


INTRODUCTION

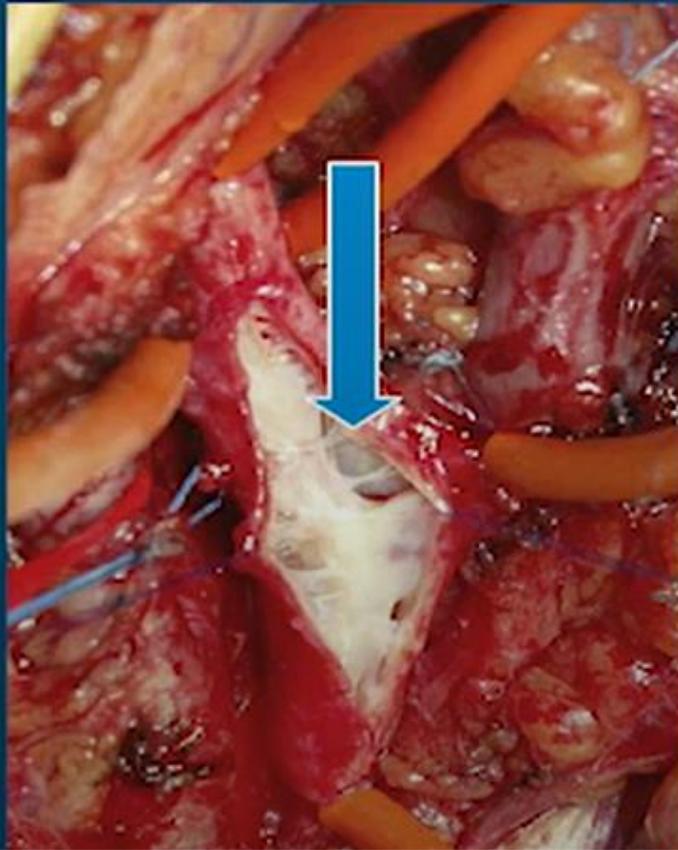
- German Pathologist, Rudolph Virchow, first identified presence in 1851
- Described in 1957 by Dr. May and Dr. Thurner, as a left common iliac vein thrombosis secondary to compression by an overriding right common iliac artery
- 22-32% of 430 cadavers
- Direct compression causes intraluminal fibrous spurs, which predispose formation of thrombus
- Majority of cases follow left-sided description, but other variants, such as right-sided MTS or compression of IVC have been reported



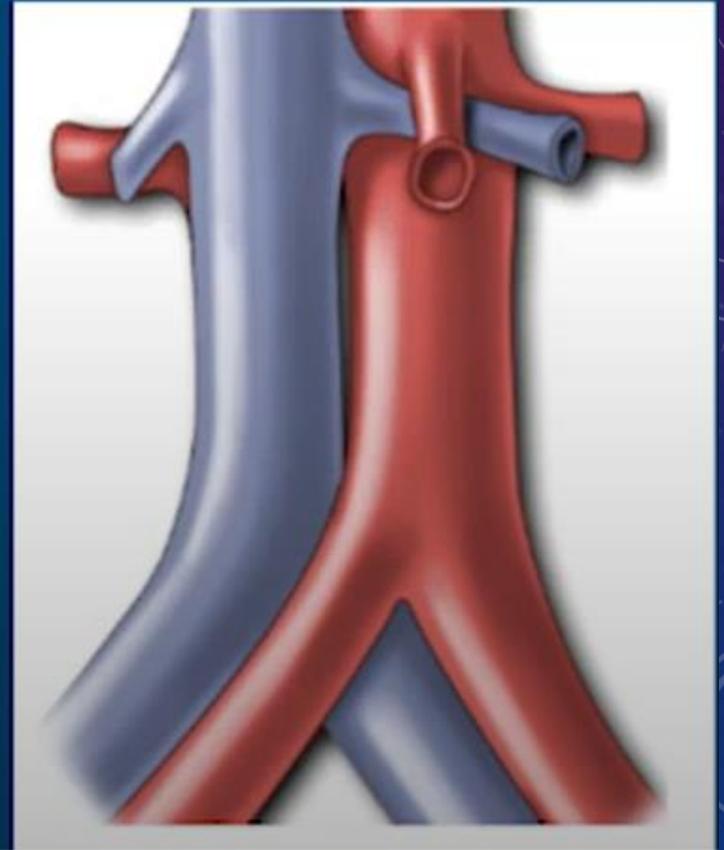
Overlying Right
Common Iliac Artery



Fibrous Spurs



Typical MTS



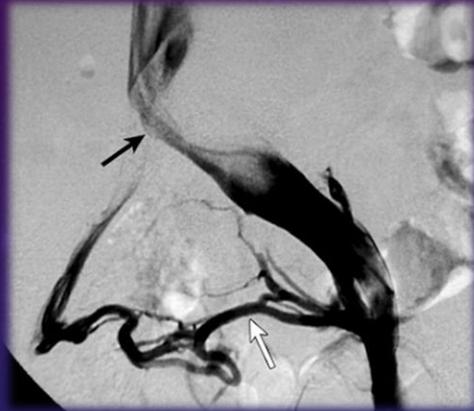
Underlying Left Iliac Vein

EPIDEMIOLOGY AND RISK FACTORS

- Incidence and prevalence unknown but likely underestimated
- Most have no symptoms or require no treatment
- 2-5% patients with symptomatic lower extremity venous disorder (higher in reported studies)
- 5% patients with MTS develop signs/symptoms
- Presents in women in their 30s
- History of multiple pregnancies
- Postpartum
- Oral contraceptive use
- Hypercoagulable disorders
- Recent trauma or abdominal/lower extremity surgery
- Scoliosis may predispose due to compression from lower lumbar vertebra



MORE ON THE “WHO”



- > 25% Healthy individuals
- Ranges from 18-49% those patients with left lower extremity DVT
- 1/3 of all DVTs are iliofemoral
- Up to 60% of these patients get post thrombotic syndrome 
- Asymmetric acute iliofemoral DVT must exclude MTS

EVALUATION

- Detailed History and Physical
 - Special attention to pronounced, unexplained left lower extremity edema
 - May have evidence of varicose veins, telangiectasias
 - Suspect MTS
- Imaging
 - Duplex ultrasound
 - Contrast venogram (Cath Lab)
 - CTA
 - MRA/MRV
 - Intravascular ultrasound (IVUS) – GOLD STANDARD



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Every gun makes its own tune.



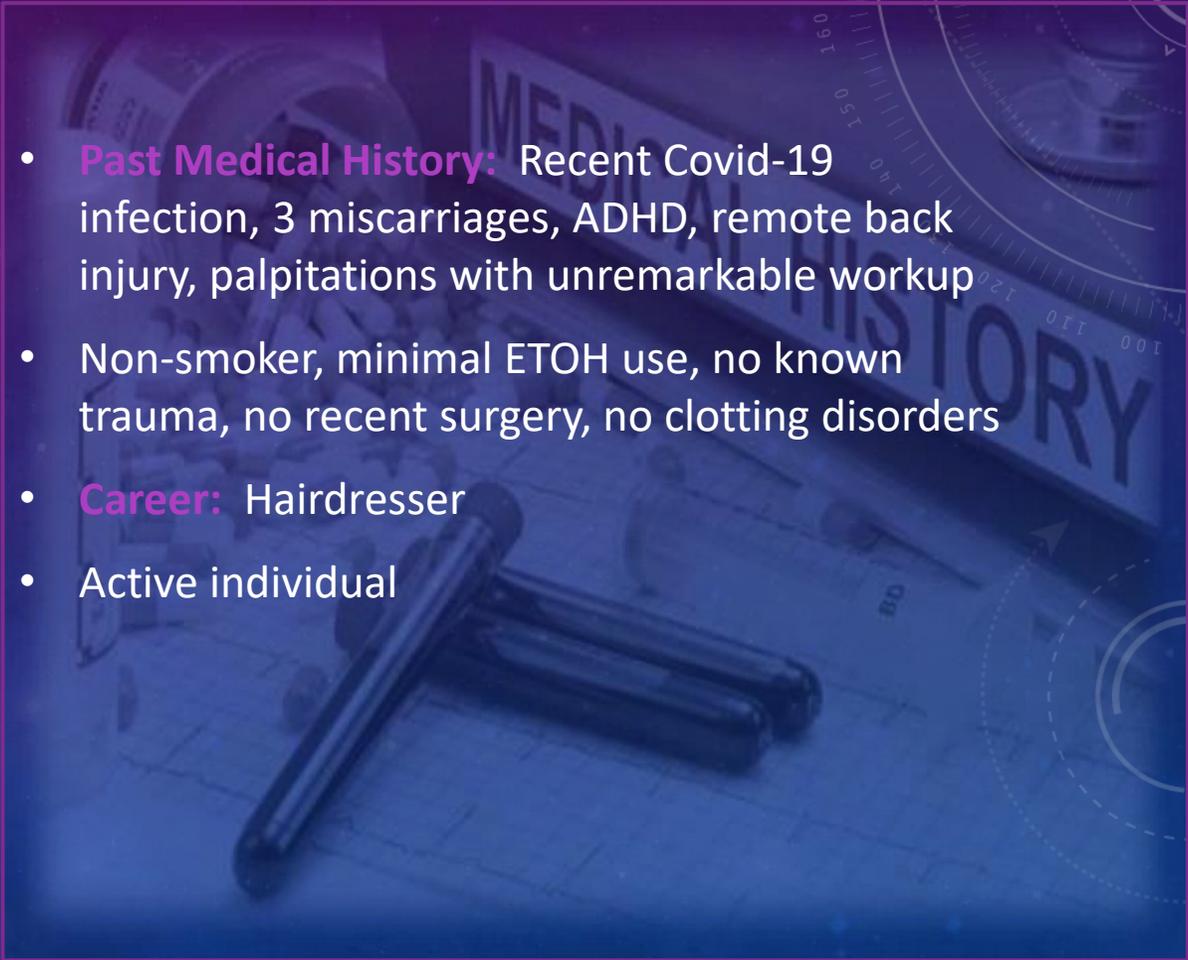
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CASE STUDY: THE CASE OF THE HAIRDRESSER



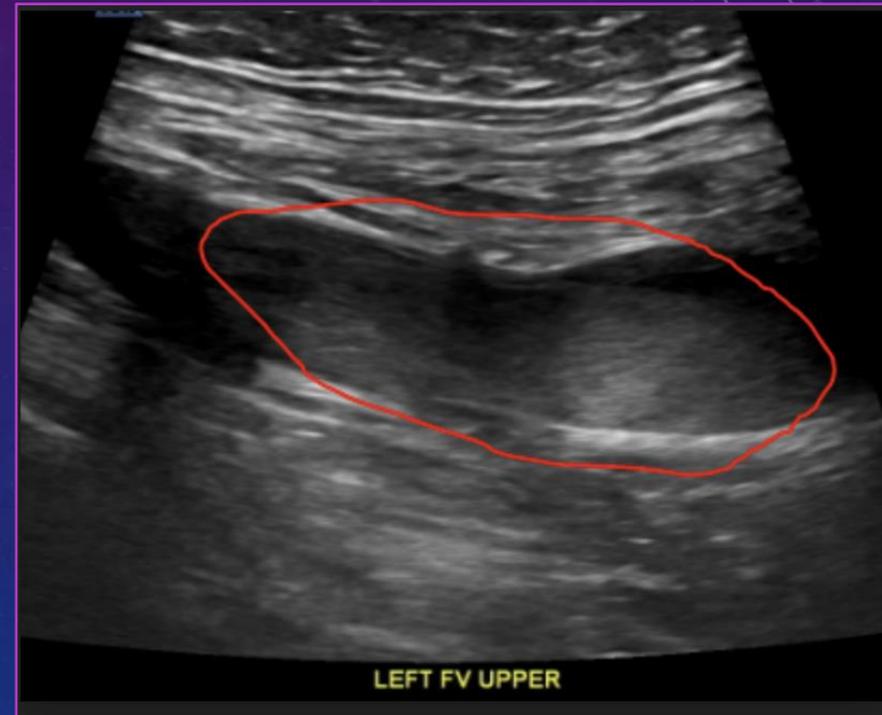
CASE STUDY DETAILS

- Healthy 45-year-old female
- Presents to the emergency room this past February with fairly acute onset of worsening left lower extremity edema, discoloration, temperature changes, and significant discomfort, worse over past 4 hours
- Noted increased swelling to left leg for 2 weeks
- Reports lower back discomfort and left hip discomfort present x 2 months, in which she was undergoing further workup for multiple sclerosis
- Recent diagnosis of Covid-19 (mild symptoms)

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- **Past Medical History:** Recent Covid-19 infection, 3 miscarriages, ADHD, remote back injury, palpitations with unremarkable workup
 - Non-smoker, minimal ETOH use, no known trauma, no recent surgery, no clotting disorders
 - **Career:** Hairdresser
 - Active individual

EVALUATION

- **Examination:** Circumferential left lower leg swelling with pitting edema, cyanotic, cool to touch, intact pedal pulses
- Presence of phlegmasia cerulea dolens
- **Imaging:**
 - Venous Duplex – extensive occlusive DVT of the LLE extending from common femoral vein to calf
 - Arterial Duplex – negative for arterial disease
 - Echocardiogram – normal EF 62%, normal RV size and function
- **Labs:** CBC, CMP, Hepatic panel, COVID, thrombophilia panel, PT/INR, PTT – all unremarkable; **D-dimer elevated 2446**
- **Initiated on Heparin infusion**
- **Vascular service consulted**



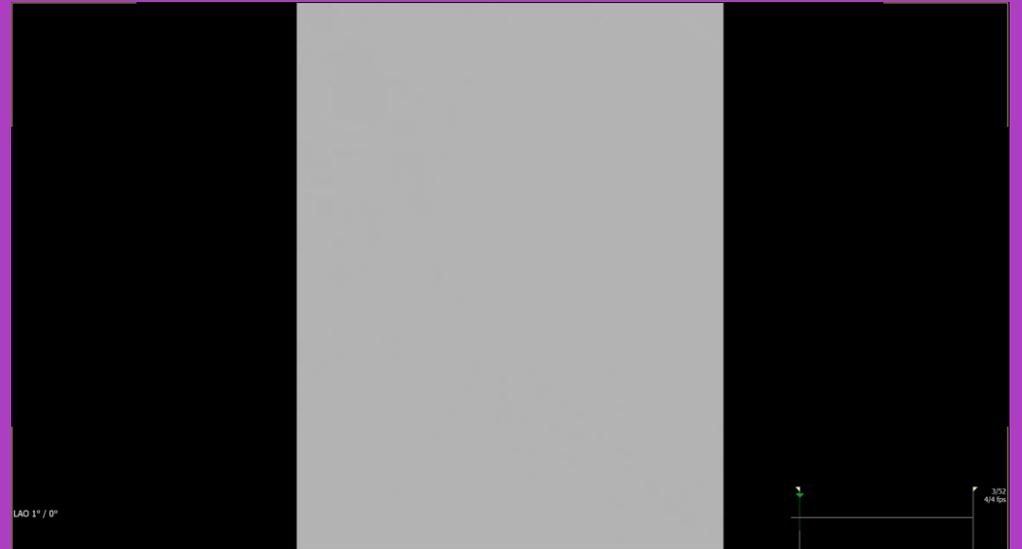
Thrombus present in left femoral vein

PHLEGMASIA CERULEA DOLENS

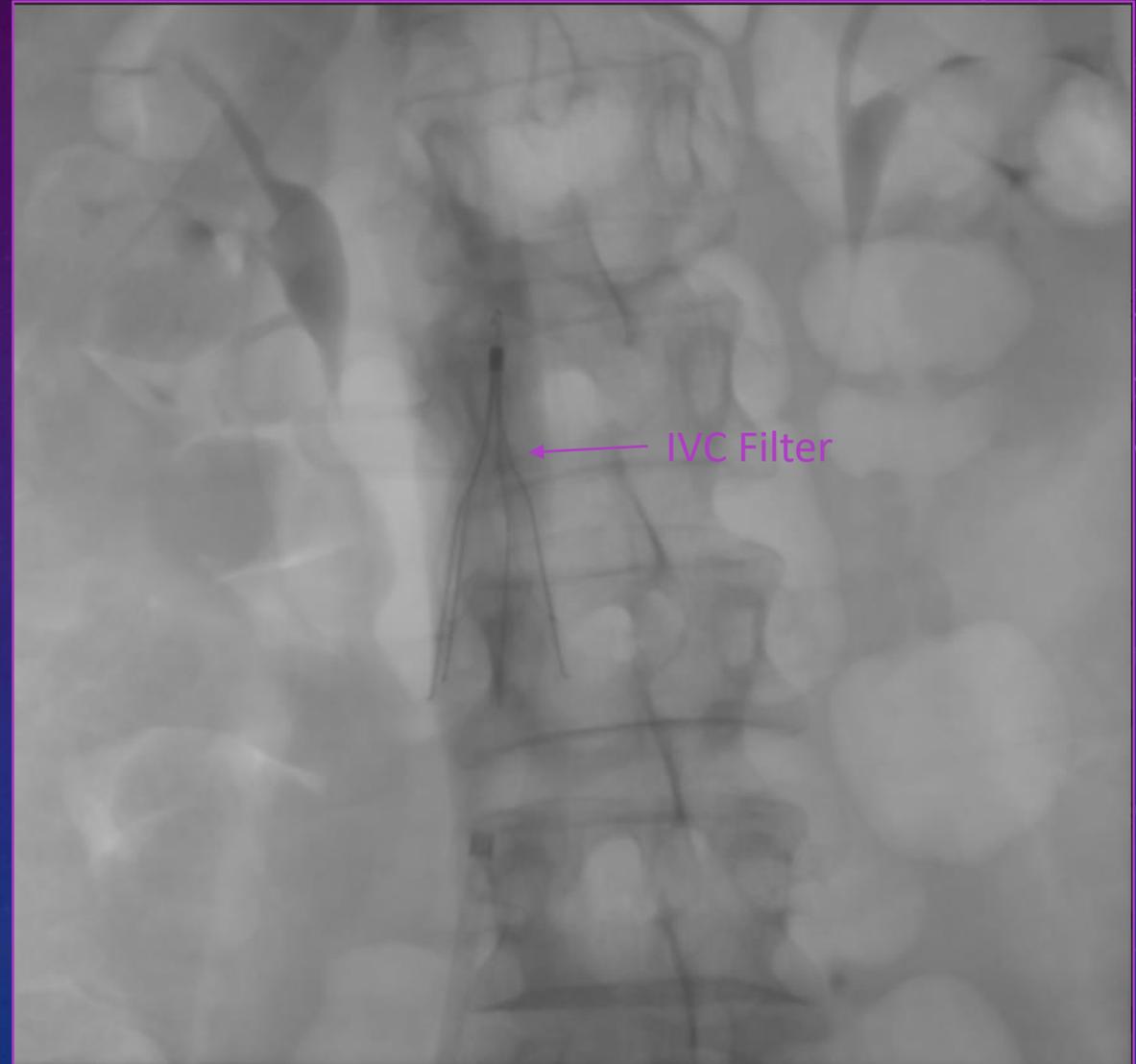
“Uncommon but potentially life-threatening complication of acute DVT characterized by marked swelling of the extremities with pain and cyanosis, which in turn may lead to arterial ischemia and ultimately gangrene with high amputation and mortality rates” (Chaochankit & Akaraborworn, 2018, Abstract section)

VENOGRAM

- **Venography:** Occluded left common iliac vein and external iliac vein, sluggish flow to left common femoral and femoral vein (patent but large amount of thrombus present), occluded popliteal vein and calf veins
- Large amount of thrombus present in distal inferior vena cava (IVC) → IVC Filter placement
- **Intervention:**
 - Infusion of thrombolytic therapy with Alteplase into the distal IVC and left iliac venous system with 30 minute dwell
 - Mechanical aspiration, vacuum-assisted thrombectomy of distal IVC and left iliac venous system



IVC FILTER PLACEMENT

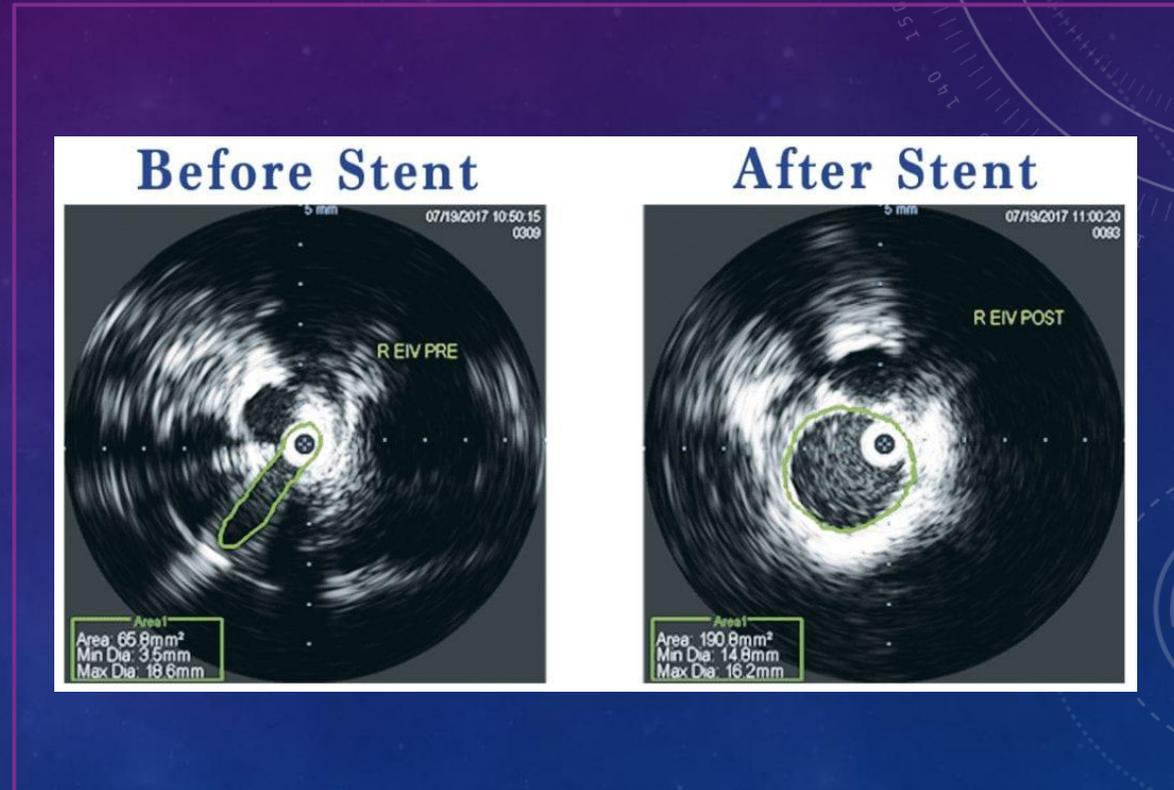


THROMBUS



INTRAVASCULAR ULTRASOUND ASSESSMENT

- Gold Standard
- Specially designed catheter with miniaturized ultrasound probe on the distal end of the catheter used to visualize inside blood vessels; proximal end is connected to computer equipment
- Detailed information: location and extent of compression, presence of collaterals, measurements (diameter, length), guide in direction to selection of interventional tools – stent (size) and outcomes after intervention
- Contrast venography alone is not reliable to assess severity of stenosis and management during intervention



INTRAVASCULAR ULTRASOUND ASSESSMENT

- Provided measurements and detailed assessment of the venous system
 - IVC demonstrated organized thrombus
 - Confirmed May Thurner syndrome with complete occlusive compression of the left common iliac vein by the right iliac artery with associated perivenous fibrosis and scarring
- IVUS-guided “kissing” common iliac venous stents

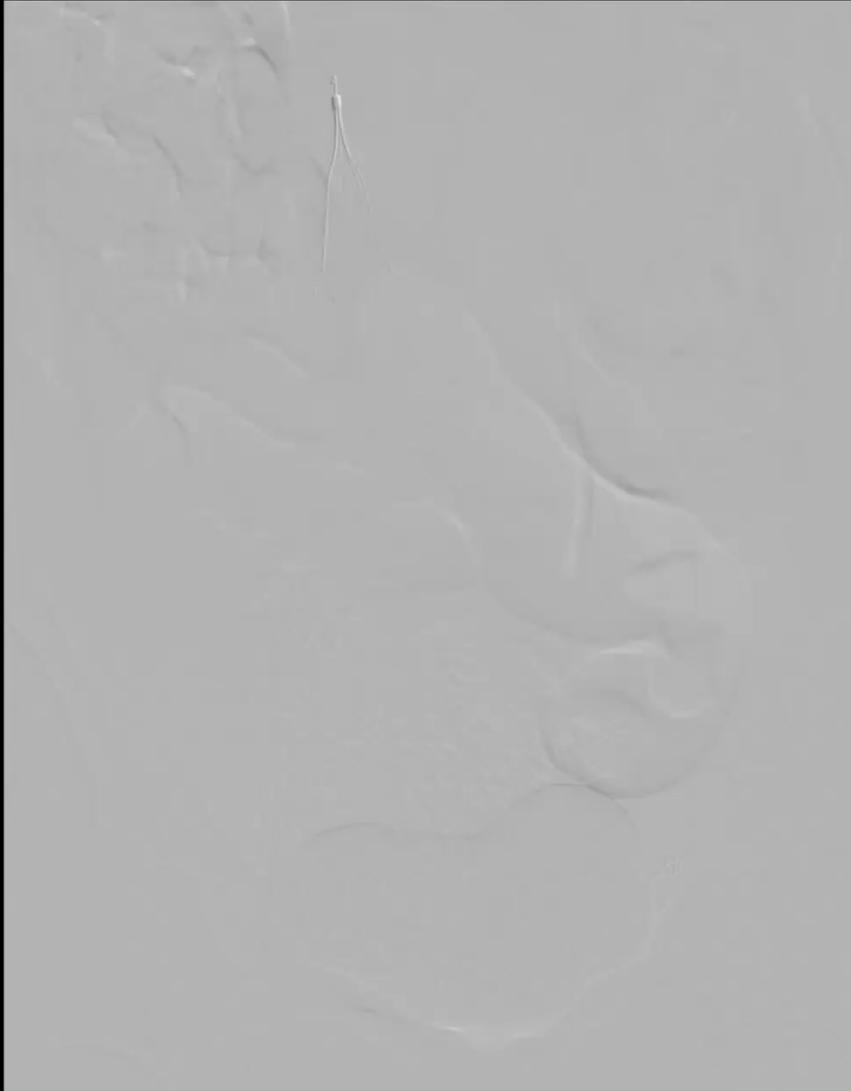


FURTHER INTERVENTION

- Bilateral “kissing” common iliac venous stents into the distal inferior vena cava (right: 18 x 100 mm and left: 18 x 120 mm)



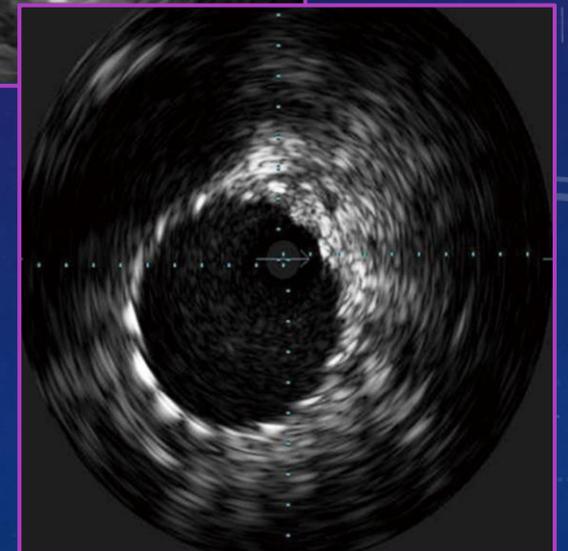
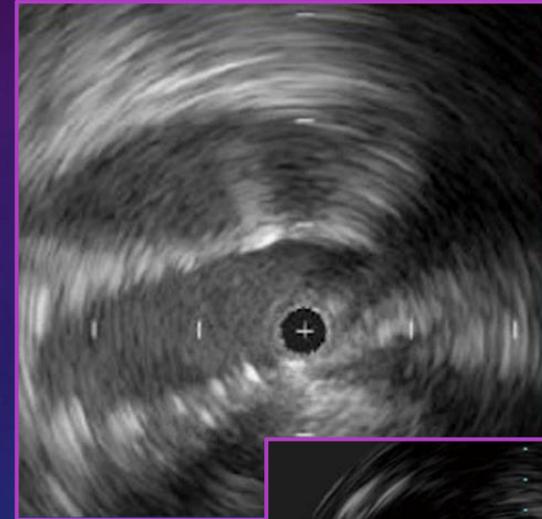
LAO 2° / 0°



3/52
4/4 fps

INTERVENTION CONTINUED . . .

- **IMPORTANT:** Angioplasty alone is not adequate – optimal results will not be achieved and reoccurrence is high
- Optimal Goal: Achieve round expansion rather than oval expansion to prevent restenosis or thrombosis
 - Older generation stents created more of an oval expansion (1st available 1990s)
 - New generation stents in the last 4-6 years allow for proper round expansion due to increased radial force of the new stents (self-expanding, precise placement), followed by post-stent balloon dilation to fully expand the stent



TREATMENT

- No clear-cut guidelines
- Treatment dependent on whether DVT is present
 - Nonthrombotic/mild – conservative – compression stockings
 - Nonthrombotic/moderate to severe – (advanced chronic venous insufficiency – limb swelling, pain, skin discoloration) – reduce severity of stenotic lesion with angioplasty and stenting
 - Thrombotic (without contraindication to lytic therapy) – full therapeutic anticoagulation, decrease volume of thrombus by catheter-directed thrombolysis therapy, use of IVUS therapy to evaluate for MTS, angioplasty/stenting
- If treatment options not available, alternative strategy with anticoagulation with interval vascular imaging (suboptimal outcomes)

- If contraindications to lytic therapy – mechanical thrombectomy, open surgical options
- Following intervention, knee or thigh-high compression stockings (30-40 mmHg)
- Therapeutic anticoagulation: Coumadin or **NOACS** - Xarelto, Eliquis, (3-6 months) **Jury is still out**
- Following stenting, concurrent antiplatelet therapy (Plavix) – 2-3 months
- If pregnant, no anticoagulants, only antiplatelet therapy

IMPORTANT: Successful treatment rates of post-thrombotic syndrome < 10%; without treatment, 80-90%

HAIRDRESSER CONTINUED . . .

- Hospital course
 - Uneventful
 - Following day: Venous duplex demonstrated bilateral stent patency, no residual thrombus or DVT
 - Discharged day 2 on acute DVT dosing of Xarelto therapy (15 mg BID) for 20 days followed by standard dosing 20 mg daily, in addition to Plavix for 6 weeks

FOLLOW-UP

- Follow-up in one month with venous duplex imaging, then 6 months, and so forth . .
- Assess for venous insufficiency
 - Occasional complete resolution of venous infiltrates post intervention
 - Some continue to have chronic venous insufficiency because veins have been stretched to point of no return



THE GOOD . . .

- More awareness
- Most are asymptomatic
- Multiple imaging modalities, noninvasive for diagnosis
- Treatable
- Technology improving – stent design, tools
- Specialists are available



THE BAD . . .

- Grossly under diagnosed
- Limited awareness
- Identified with thrombotic event
- No clear cut guidelines
- Require anticoagulant therapy/antiplatelet therapy



THE UGLY . . .

- Anticoagulant/Antiplatelet therapy
- Post-thrombotic syndrome
- Chronic venous insufficiency



A FEW PEARLS

- Although MTS accounts for small number presenting with DVT, multiple autopsy studies have shown that the actual prevalence is higher
- Remains clinically silent in most patients
- Iliofemoral DVT is the most common presentation of MTS
- Young women are higher risk
- A transient risk factor is usually present in patients with MTS, which precipitates the thrombotic event
- Prompt anticoagulation is necessary
- Venogram with IVUS is the gold standard in diagnosing MTS. It also helps in the treatment of DVT
- Catheter-directed thrombolysis, followed by stent placement, is the treatment of choice
- Post-thrombotic syndrome is the most common adverse event after developing iliofemoral DVT

THE HAIRDRESSER . . .



“ I’ll tell you one thing, Blondie. If I knew that my last hour had come, I swear, in my place . . . In your place I would do the same thing. I would tell you about the gold. Yes, yes, I would.



”

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