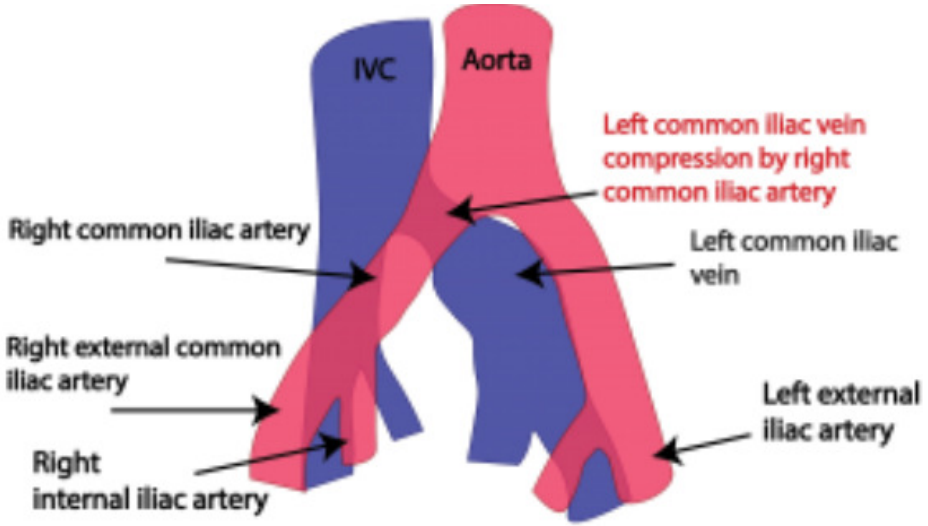
Peripheral Vein Stenosis
May-Thurner syndrome (MTS)

Objectives

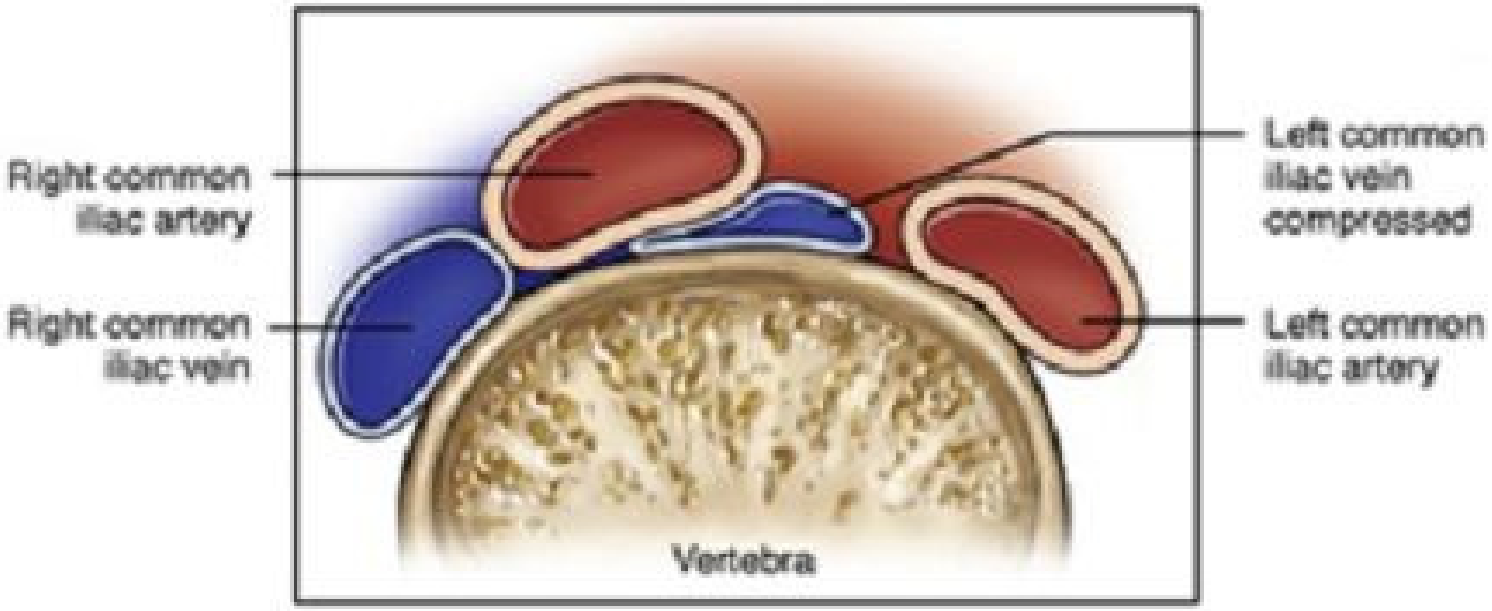
- Understand symptoms of vein compression and venous insufficiency
- Understand work up and positive findings
- Understand Interventional treatment for vein compression and venous insufficiency
- Post procedure care

Compression of the left iliac vein by right iliac artery

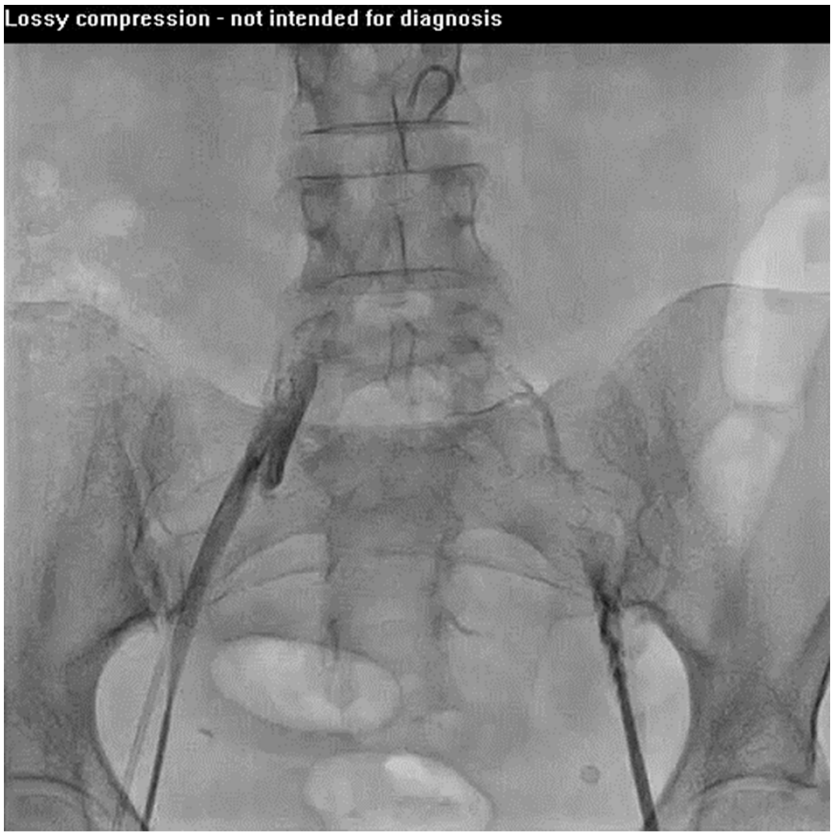


Compression of left iliac vein by the right iliac artery

Cross sectional view



May-Thurner Syndrome



May-Thurner Syndrome

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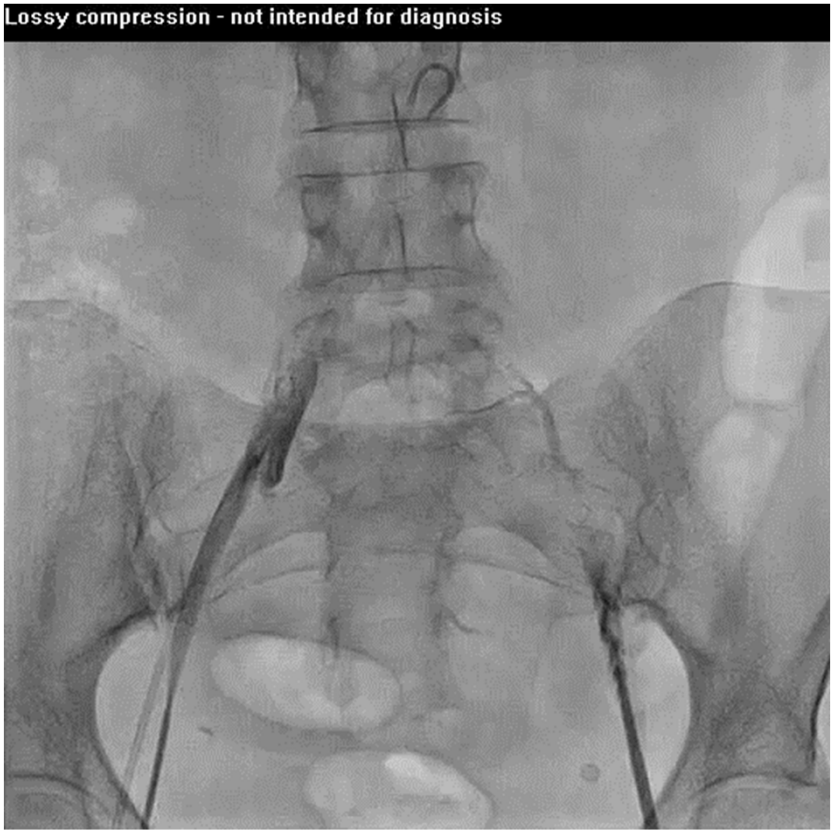


Prevalence

- Unknown due to asymptomatic
- It commonly affects women age 25-50 years
- Retrospective studies suggest higher rates, MTS

Kibbe MR, Ujiki M, Goodwin AL, et al. Iliac vein compression in an asymptomatic patient population. J Vasc Surg 2004; 39:937.
The American Journal of Medicine, Vol 127, No7, July 2014. https://www.amjmed.com/article/S0002-9343(14)00185-5/pdf
American college of cardiology, iliofemoral deep vein thrombosis: https://www.acc.org/latest-in-cardiology/articles/2015/11/23/13/39/iliofemoral-deep-vein-thrombosis

Risk factors

- Female 25-50 yo
- Postpartum, multiparous or using oral contraceptives
- Hypercoagulable disorders

Symptoms

- Venous insufficiency involving affected limb
- Venous claudication
- Superficial venous thrombosis or DVT

Skin changes

Assessment/Work up

- History
- Review medication to reduce potential side effects of peripheral edema:
  1. **CCB, NSAIDS, Pioglitazone, Gabapentin, Pregabalin, Vasodilators**
- Exam findings: edema/varicosities/skin changes
- Vein mapping/Venous doppler
- MR Venography or CT : evaluate vein compression: MTS
- Cath: Venography for diagnosis and treatment

CEAP Classification

- **Clinical Disease (C)**
- **Etiology (E)**
- **Anatomic Distribution (A)**
- **Pathophysiology (P)**

Class 0	No visible or palpable signs of venous disease
Class 1	Telangiectasias or reticular veins
Class 2	Varicose veins
Class 3	Edema
Class 4	Skin changes ascribed to venous disease (e.g. pigmentation, venous eczema, lipodermatosclerosis)
Class 5	Skin changes, as defined above, with healed ulceration
Class 6	Skin changes, as defined above, with active ulceration

Use the controls at the top to view. Use the Continue to go forward.

C0
No visible or palpable signs of venous disease

C1
Telangiectases or reticular veins

C2
Varicose veins

C3
Oedema

C4
a. Pigmentation and/or eczema
b. Lipodermato-sclerosis and/or atrophie blanche

C5
Healed venous leg ulcer

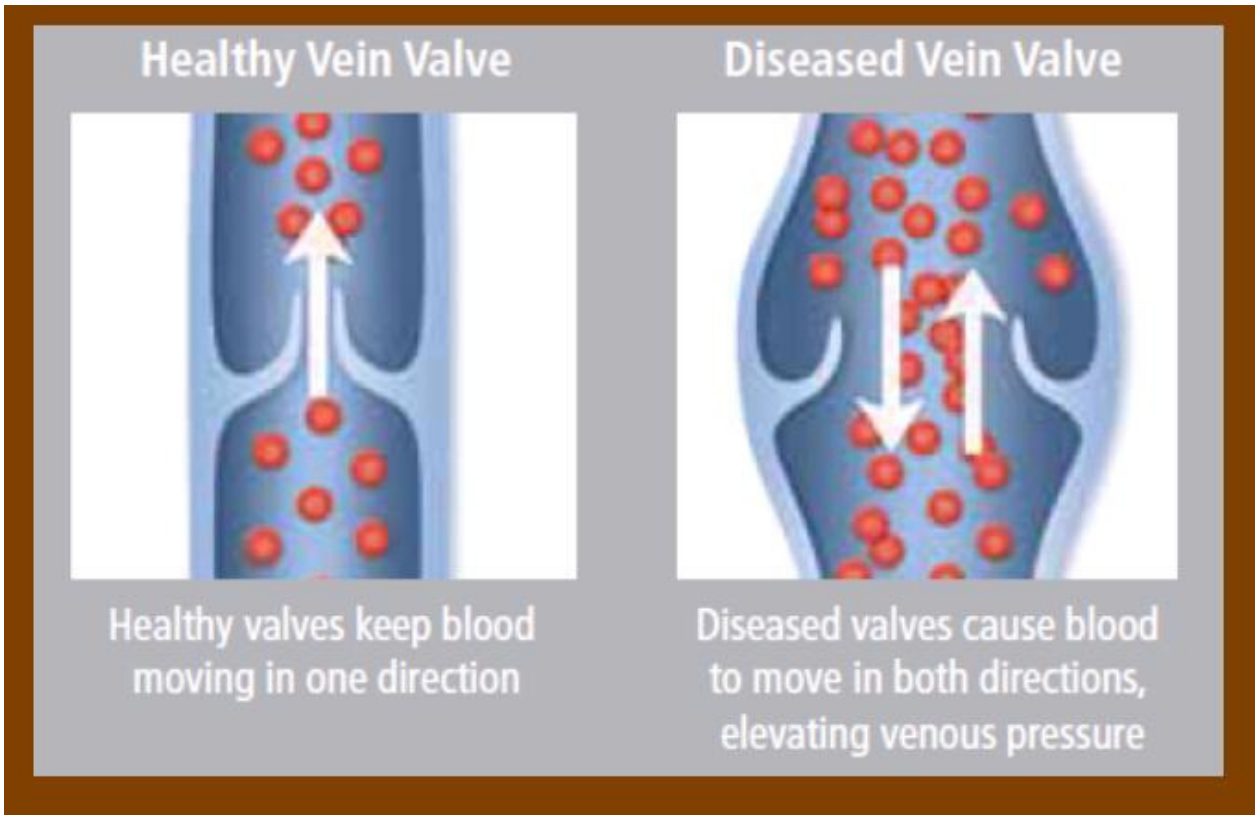
C6
Active venous ulcer

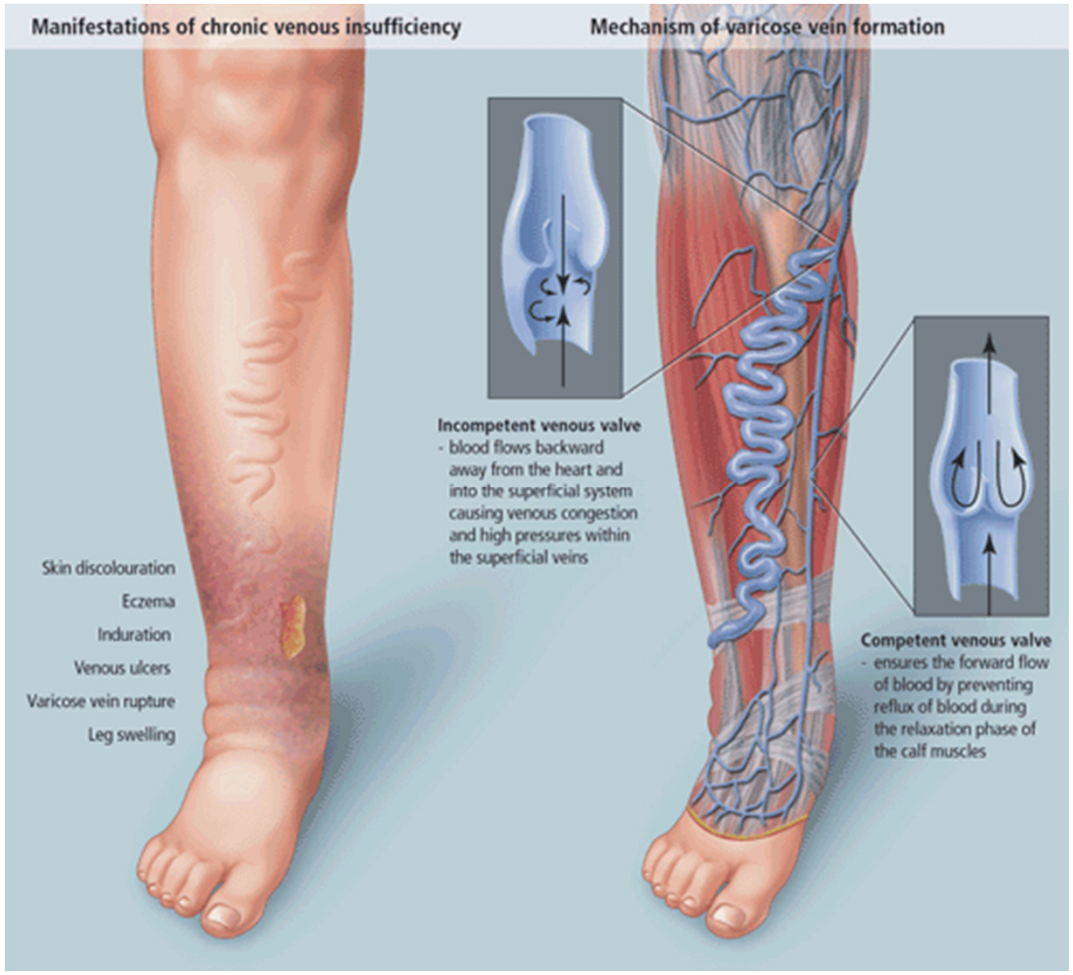
Revised Venous Clinical Severity Score

- Complementary to the CEAP classification
- Ten clinical parameters are graded from zero to three depending upon severity (None = 0, Mild = 1, Moderate = 2, Severe = 3)
  - pain,
  - varicose veins
  - venous edema
  - pigmentation
  - inflammation
  - induration
  - number of active ulcers
  - duration of active ulcers
  - size of active ulcers
  - compliance with compression therapy

Ultrasound/Venous doppler

- Assess for DVT
- Vein mapping assess for both dvt and reflux
- Limited in detecting MTS


Healthy Vein Valve
Diseased Vein Valve
Healthy valves keep blood moving in one direction
Diseased valves cause blood to move in both directions, elevating venous pressure


Manifestations of chronic venous insufficiency
Mechanism of varicose vein formation
Skin discolouration
Eczema
Induration
Venous ulcers
Varicose vein rupture
Leg swelling
Incompetent venous valve
- blood flows backward away from the heart and into the superficial system causing venous congestion and high pressures within the superficial veins
Competent venous valve
- ensures the forward flow of blood by preventing reflux of blood during the relaxation phase of the calf muscles

Vein ablation

- Out patient procedure
- Catheter ablates the GSV and/or LSV to treat reflux
- Post procedure:
  - Compression hose
  - Activity as tolerated
  - Vein ultrasound at 1 week and 1 month post procedure

MR/CT Venography

- Both detect: location and severity of stenosis, venous collateral flow and anatomy
- Both have > 95% sensitivity and specificity
- MR is not applicable in patient with Devices and some hardware

Oguzkurt L, Tercan F, Pourbagher MA, et al. Computed tomography findings in 10 cases of iliac vein compression (May-Thurner) syndrome. Eur J Radiol 2005; 55:421.
Wolpert LM, Rahmani O, Stein B, et al. Magnetic resonance venography in the diagnosis and management of May-Thurner syndrome. Vasc Endovascular Surg 2002; 36:51.

Venography

- Gold standard for diagnosis
- Obtain pressure gradients across the stenosis.
- Patients benefit from treatment greater than 50% compression

Neglén P, Hollis KC, Olivier J, Raju S. Stenting of the venous outflow in chronic venous disease: long-term stent-related outcome, clinical, and hemodynamic result. J Vasc Surg 2007; 46:979.

Iliac vein stenting

- For mild symptoms, compression hose treatment is adequate (CEAP class 1-3)
- Angioplasty/stenting for mod-sev symptomatic patients (CEAP class 3 with severe edema and CEAP class 4-6)

Iliac vein stenting

- Angioplasty alone has a high recurrence
- Stenting reduces recurrence and recurrence rate of superficial venous reflux (SVR)
- If SVR is still present then vein ablation is considered.

Mickley V, Schwagierek R, Rilinger N, et al. Left iliac venous thrombosis caused by venous spur: treatment with thrombectomy and stent implantation. J Vasc Surg 1998; 28:492.
Yin M, Huang X, Cui C, et al. The effect of stent placement for May-Thurner syndrome combined with symptomatic superficial venous reflux disease. J Vasc Surg Venous Lymphat Disord 2015; 3:168.

Efficacy of Stenting

- At 1 year patency rates were 50-81%
- Patency rates at 24 months were 71 and 97%.
- Resolution of symptoms correlated with stent patency

Neglen P, Hollis KD, Olivier J, Raju S. Stenting of the venous outflow in chronic venous disease: long-term stent-related outcome, clinical, and hemodynamic result. J Vasc Surg 2007: 46:979
Raju S, Owen S Jr, Neglen P. The clinical impact of iliac venous stents in the management of chronic venous insufficiency. J Vasc Surg 2002; 35:8.

Post procedure care

- Aspirin indefinitely
- Consider: Antiplatelet therapy with clopidogrel
- Thromboprophylaxis x 2 weeks to prevent thrombosis is considered
- OTC Pain management (common back pain x 2 weeks)
- Unilateral venous Doppler 3, 6, and 12 month

Case presentation

- 46 year old female: multiparous with leg swelling/pain, left greater than right
- Obesity with BMI of 35, htn, hyperlipidemia, GERD, thyroid, chronic back pain, and noticeable varicose veins bilateral legs.
- ROS: denies shortness of breath, orthopnea, pnd, claudication. + LE bilateral leg swelling L>R

Case presentation cont.

- Medications:
  a. Atorvastatin 20mg po pm
  b. Vitamin D 50,000 iu po monthly
  c. Nexium 40mg po daily
  d. Hydrocodone 10-325mg 1 po q day prn
  e. Levothyroxine 100mcg po daily
  f. Tizanidine 4mg po hs prn

Exam findings

- Lungs CTAB; Heart S1S2 RRR; LE 1+ edema with erythema 2/3 lower leg with left leg greater than right by .5cm ankle and calf.

Vein mapping results

BILATERAL LOWER EXTREMITY VENOUS INSUFFICIENCY
DUPLEX ULTRASOUND

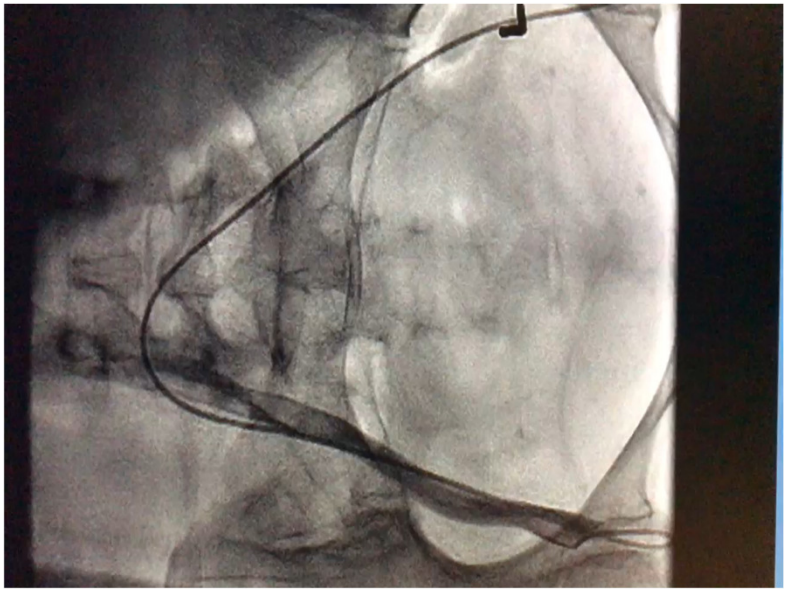
B-mode imaging, spectral Doppler, and color Doppler of the lower extremity venous system

INDICATION: Edema and leg pain
PREVIOUS EXAM: None

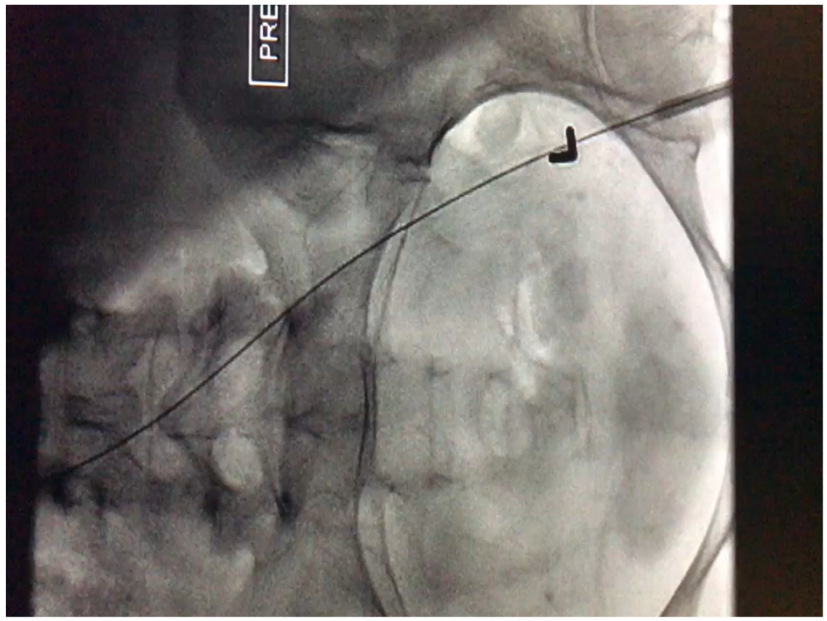
MEASUREMENTS

RIGHT	DIAMETER (cm)	REFLUX (sec)	LEFT	DIAMETER (cm)	REFLUX (sec)
Prox GSV Thigh	0.63	>4	*Prox GSV Thigh*	0.65	>4
Mid GSV Thigh	0.31	4	*Mid GSV Thigh*	0.29	0
Dist GSV Thigh	0.32	0	*Dist GSV Thigh*	0.34	0
Prox LSV	0.30	0	*Prox LSV*	0.47	0
Mid LSV	0.24	0	*Mid LSV*	0.25	0
Dist LSV	0.22	0	*Dist LSV*	0.15	0
Prox GSV Calf	0.15	>4	*Prox GSV Calf*	0.19	0
Mid GSV Calf	0.17	0	*Mid GSV Calf*	0.30	0
Dist GSV Calf	0.21	0	*Dist GSV Calf*	0.21	0

Venogram: Normal



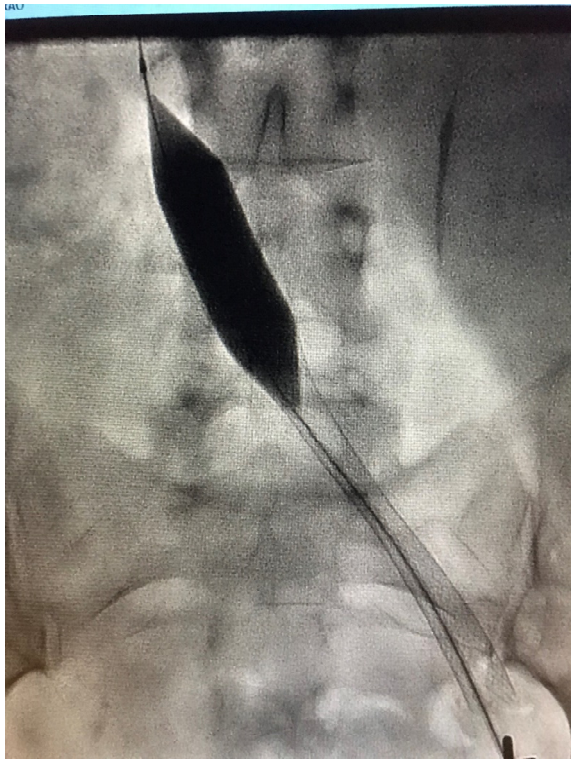
Left common iliac vein occlusion.

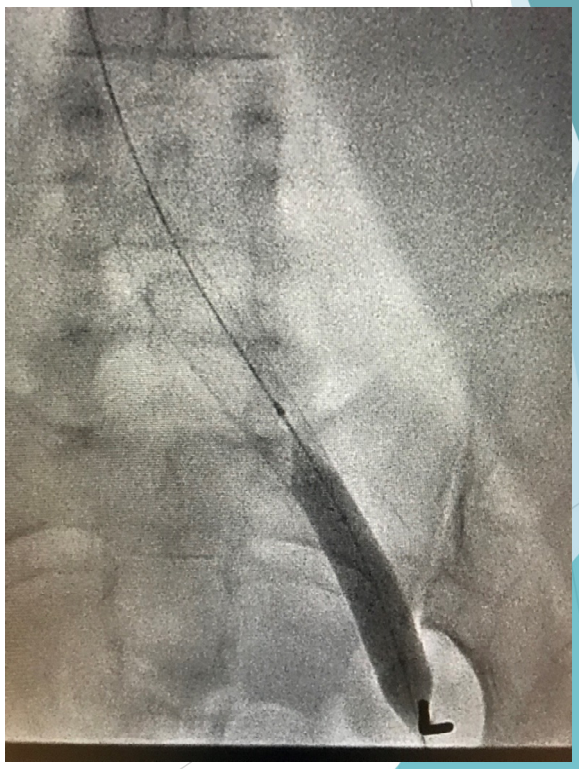


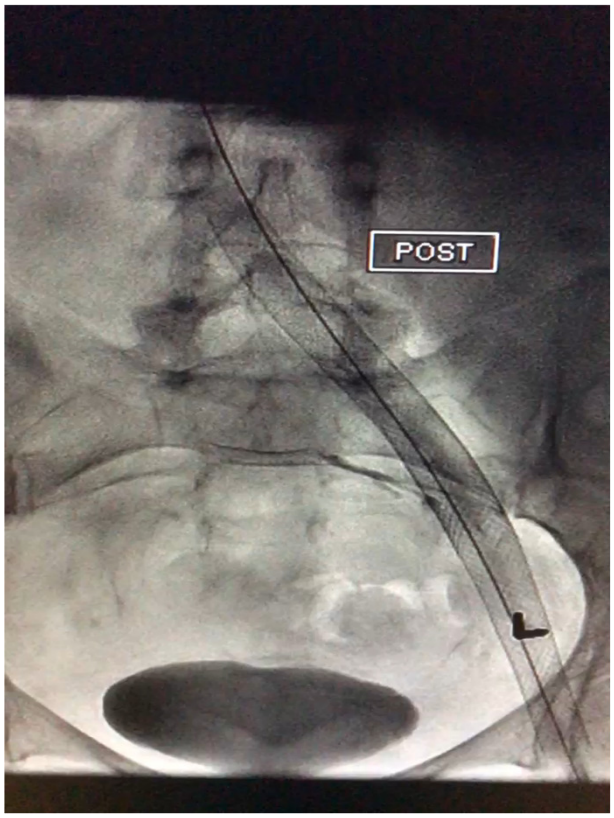
IVUS: Normal is greater than 105 mm2

Vessel	Lumen Area (mm2)	mm	x	mm
RA IVC Junction			x	
Renal V superior			x	
Renal V inferior			x	
Left CIV	44	5	x	11
Left EIV	48	4	x	12
Left CFV	50	4	x	14
right civ	123	8	x	19
right eiv	76	7	x	13
right cfv	86	7	x	14

Wall Stent: Common iliac vein






POST

2 week post cath follow up

Had 1.5 weeks of back pain

Reported resolution of left leg symptoms

Set up for right leg RFA to treat right GSV venous reflux