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9th ANNUAL CURRENT CONCEPTS IN

VASCULAR THERAPIES

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May-Thurner Syndrome: Diagnosis and Treatment

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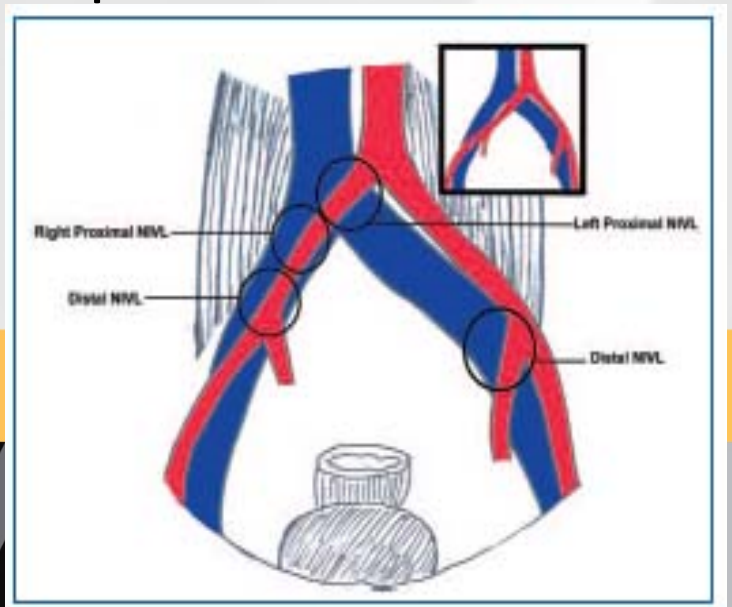
Disclosures

- None

Introduction

- Non-thrombotic Iliac Vein Lesion
  - NIVL occurs where veins are impinged, compressed or damaged by a neighboring artery or structure. Intraluminal lesion occurs in 1/3 pts.
  - NIVL may precipitate iliofemoral DVT



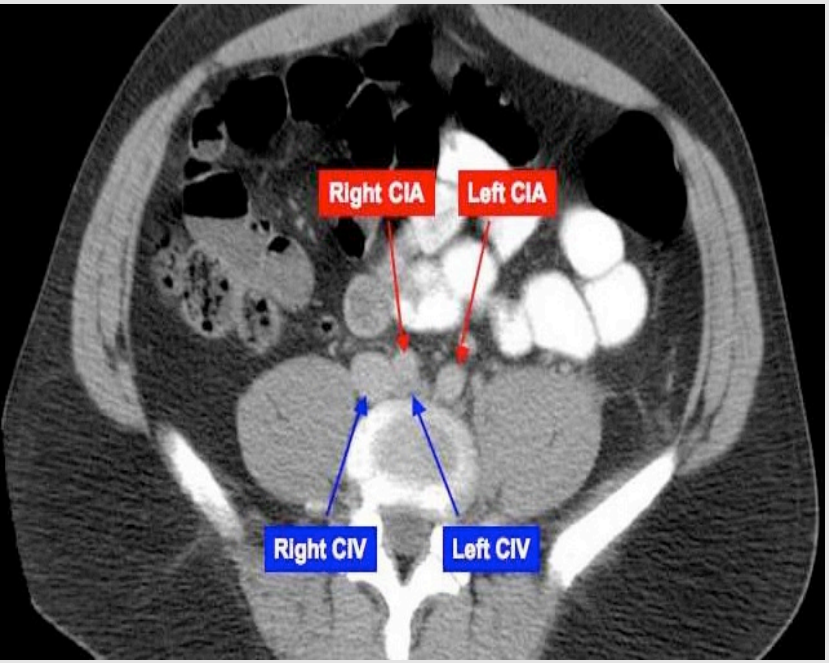
Introduction

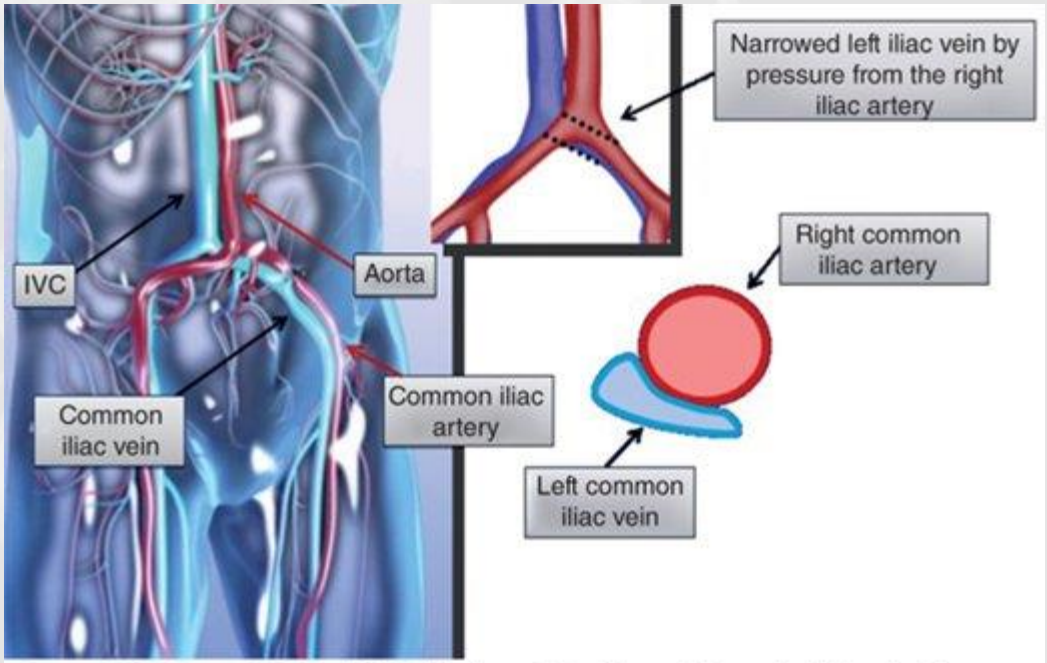
THE CAUSE OF THE PREDOMINANTLY SINISTRAL OCCURRENCE OF THROMBOSIS OF THE PELVIC VEINS[1]

R. MAY, M.D., AND J. THURNER, M.D.

- 1957- described condition by which chronic pulsations of right CIA can lead to spur formation along vein wall of left CIV

Anatomy





Source: S. M. Dean, B. Satiani, W. T. Abraham: Color Atlas and Synopsis of Vascular Diseases
www.accesssurgery.com

Prevalence

- True prevalence of May–Thurner syndrome unknown
- 20% people may have asymptomatic compression: “Permissive anomaly”
- Old data suggests women between 30-50 years are primarily affected
- Newer data indicates prevalence is more significant than thought

1. Al-Nouri O, Milner R. May-Thurner Syndrome. Vas Disease Mgt. 2011;3:53-56.

Prevalence

- Patients with severe chronic venous disease (37% >50% stenosis)[1]
- Reported to be 600,000 DVT hospitalizations per year in US
- 50-65% of DVTs occur in left leg
- Iliac vein compression thought to occur ~18 - 69% DVT [1,2]

1. Al-Nouri O, Milner R. May-Thurner Syndrome. Vas Disease Mgt. 2011;3:53-56.
2. Rosen E, Groben L, et al. Rare Case of Bilateral Common Iliac Vein Compression by Arterial Stents and Calcification. Vas Disease Mgt. 2012:9(11):E172-E174.

Stages

- Stage 1: Iliac vein compression without structural vein changes= Asymptomatic
- Stage 2: Venous spur formation which are fibrous shelves eventually developing in the vein, restricting blood flow and increasing risk for edema and DVT. Asymptomatic.
- Stage 3: Symptomatic obstruction: DVT, edema and the formation of varicose veins.

Symptoms

- Dull aching, heaviness, or cramping in legs
- Pain that gets worse when standing
- Pain that gets better when legs are raised
- Redness of the legs and ankles
- Skin color changes around the ankles
- Varicose veins on the surface (superficial)
- Thickening & hardening of the skin on the legs & ankles
- Ulcers on the legs and ankles
- DVT

Physical Exam

Clinical, Etiology, Anatomic,Pathophysiology

- **CEAP- Universal Classification &Scoring of Venous Disease**
  - C0 – No Disease
  - C1 – Spider veins
  - C2 – Varicose Veins
  - **C3 – Edema**
  - **C4 – Pigmentation, Eczema**
  - **C5 – Healed Venous Ulcer**
  - **C6 – Active Venous Ulcer**

Left Common Iliac Vein Compression

Imaging

- Venous Duplex Ultrasound: Poor sensitivity and specificity [1]
- CT Venography and MRI Venography:
  - > 95% sensitivity and specificity but require adequate technical protocols for imaging acquisition [2,3]

1.Forauer AR, Gemmete JJ, Dasika NL, Cho KJ, Williams DM. Intravascular ultrasound in the diagnosis and treatment of iliac vein compression (May-Thurner) syndrome. J Vasc Interv Radiol 2002; 13:523–527.

2. Chung JW, Yoon CJ, Jung SI, et al. Acute iliofemoral deep vein thrombosis: evalu- ation of underlying anatomic abnormalities by spiral CT venography. J Vasc Interv Radiol 2004; 15:249–256.

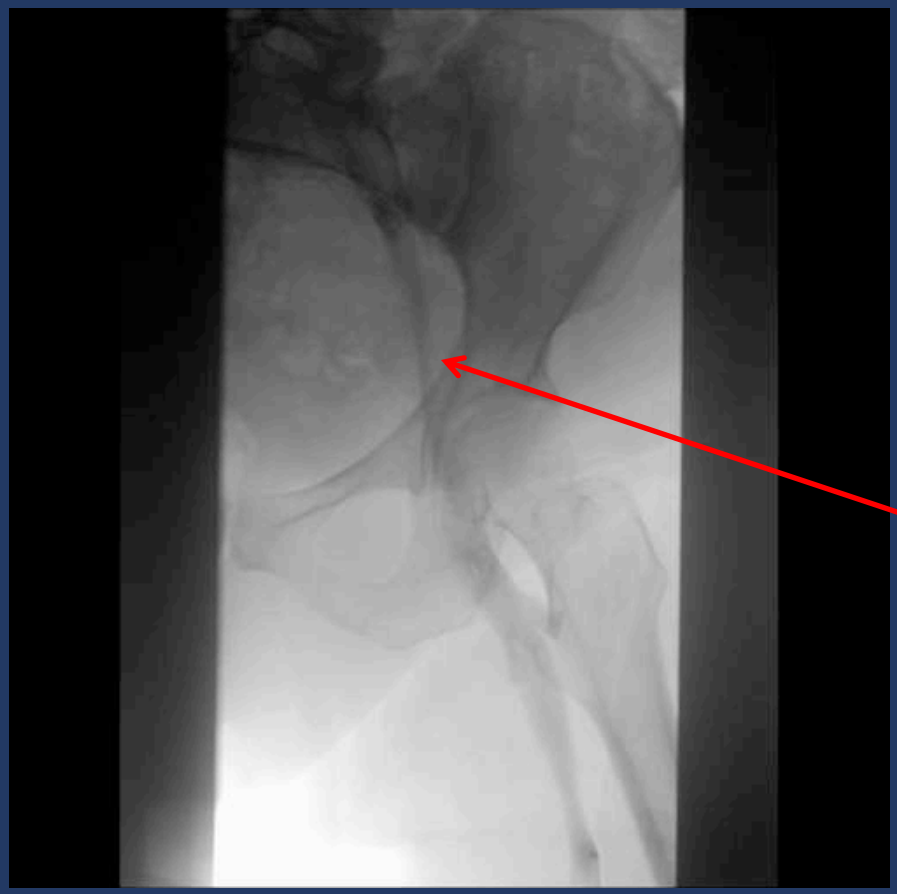
3. Wolpert LM, Rahmani O, Stein B, Gallagher JJ, Drezner AD. Magnetic resonance venography in the diagnosis and management of May-Thurner syndrome. Vasc Endovascular Surg 2002; 36:51–57.

How does IVUS compare to single plane venography?

"Single-plane venography may be relatively insensitive in the detection of iliocaval compression compared with IVUS… venography has been demonstrated to have a sensitivity of only 45% for the detection of chronic iliac obstruction"

Meissner M, Gloviczki P, et al. Early thrombus removal strategies for acute deep venous thrombosis: Clinical Practice Guidelines of the Society for Vascular Surgery and the American Venous Forum. J Vas Surg. 55:5. May 2012. pp. 1449-1462.

Venography



Clue: Thinning of dye where Artery crosses the vein

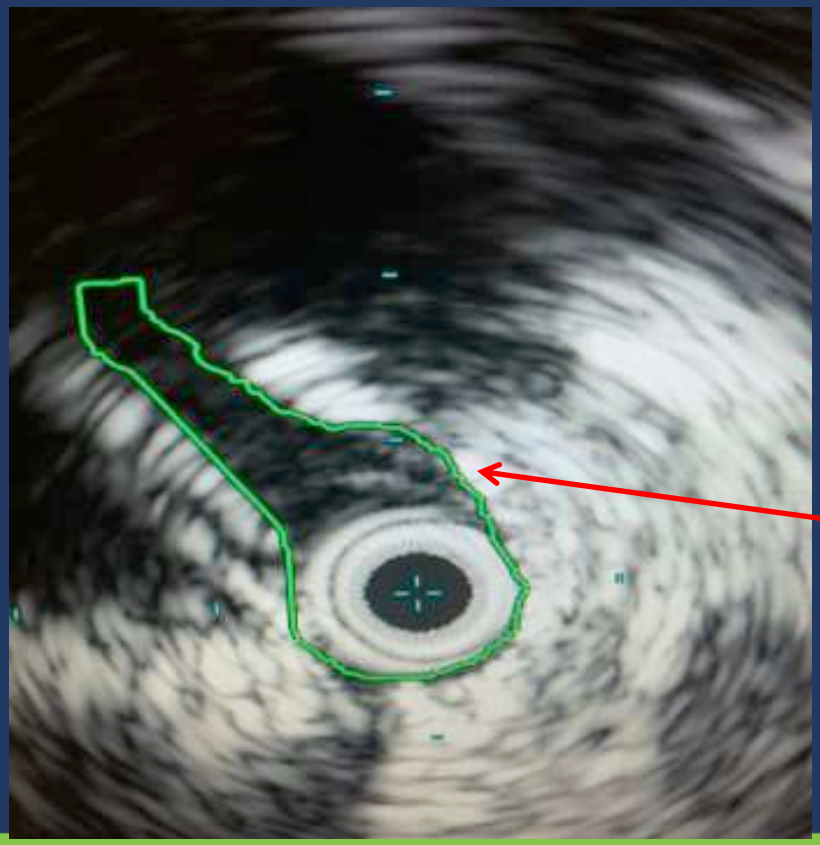
Venography

IntraVascular Ultrasound (IVUS)

- 304 consecutive limbs before and after stenting
- Used IVUS as a standard, venography single plane had a poor sensitivity 45% in detecting area stenosis >70%
- Actual **area** demonstrated higher degrees of stenosis when measured directly with IVUS as opposed to calculation of diameter (non-circular geometry of stenosis)

Neglén P, Raju S. Intravascular ultrasound scan evaluation of the obstructed vein. J Vasc Surg.2002;35:694-700.

IVUS: SIGNIFICANT ILIAC VEIN COMPRESSION



≥ 50% reduction in intraluminal area

IVUS

- Since IVUS has a diagnostic sensitivity of >90% and is free of radiation, it has become the diagnostic standard in iliac vein compression

1. Raju S. Iliac vein outflow obstruction. Phlebolymphology. Vol 15. No. 1. 2008

Conventional Managment

- Compression stockings to decrease swelling
- Wound Care Centers for open wounds sores or infections
- Laser or RF ablation of incompetent veins
- Surgery (varicose vein stripping)
- Diuretics for edema resolution
- Lymphedema Pump

Treatment

- Given “spur” and scar formation that occurs from MTS, it is clear that venous angioplasty is not in itself an effective treatment. [1]
- 1/3 patients treated with thrombolysis for iliofemoral DVT required stenting and that the stented patients had significantly higher patency than those who were not stented. [2]

1.Park JY, Ahn JH, Jeon YS, et al. Iliac vein stenting as a durable option for residual stenosis after catheter-directed thrombolysis and angioplasty of iliofemoral deep vein thrombosis secondary to May-Thurner syndrome.Phlebology2014;29:461-70.

2.Nazarian GK, Bjarnason H, Dietz CA, Jr, et al. Iliofemoral venous stenoses: effectiveness of treatment with metallic endovascular stents. Radiology 1996;200:193-9.

Treatment

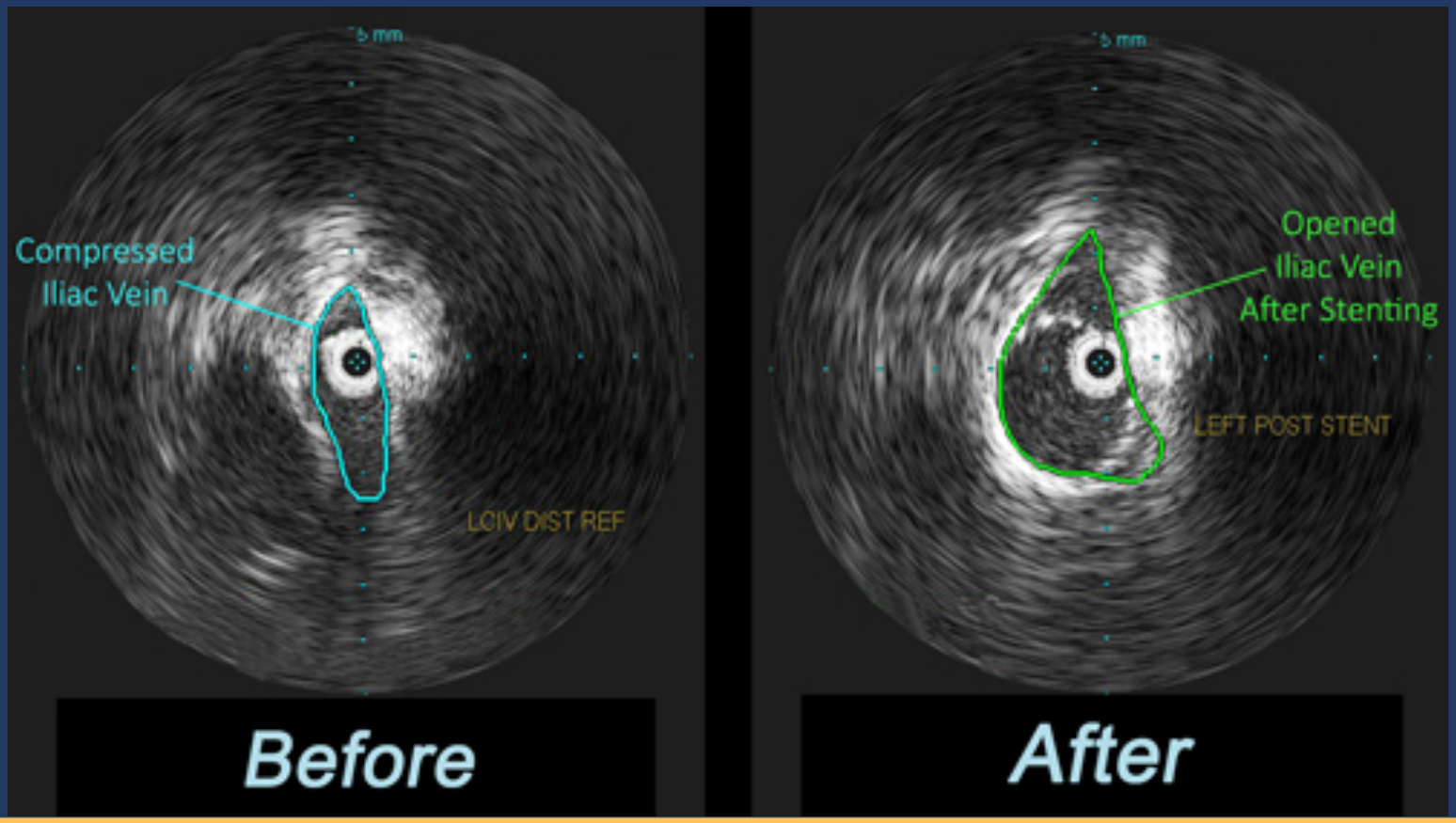
- Guidelines by the Society of Interventional Radiology and the Society of Vascular Surgery recommend iliac venous stenting in setting of iliac vein compression. [1,2]
- Durability of stents in iliac veins is described in setting of DVT, with primary patency rates of 79% at 72 months. [3]

1.Vedantham S, Millward SF, Cardella JF, et al. Society of Interventional Radiology position statement: treatment of acute iliofemoral deep vein thrombosis with use of adjunctive catheter-directed intrathrombus thrombolysis. J Vasc Interv Radiol 2006

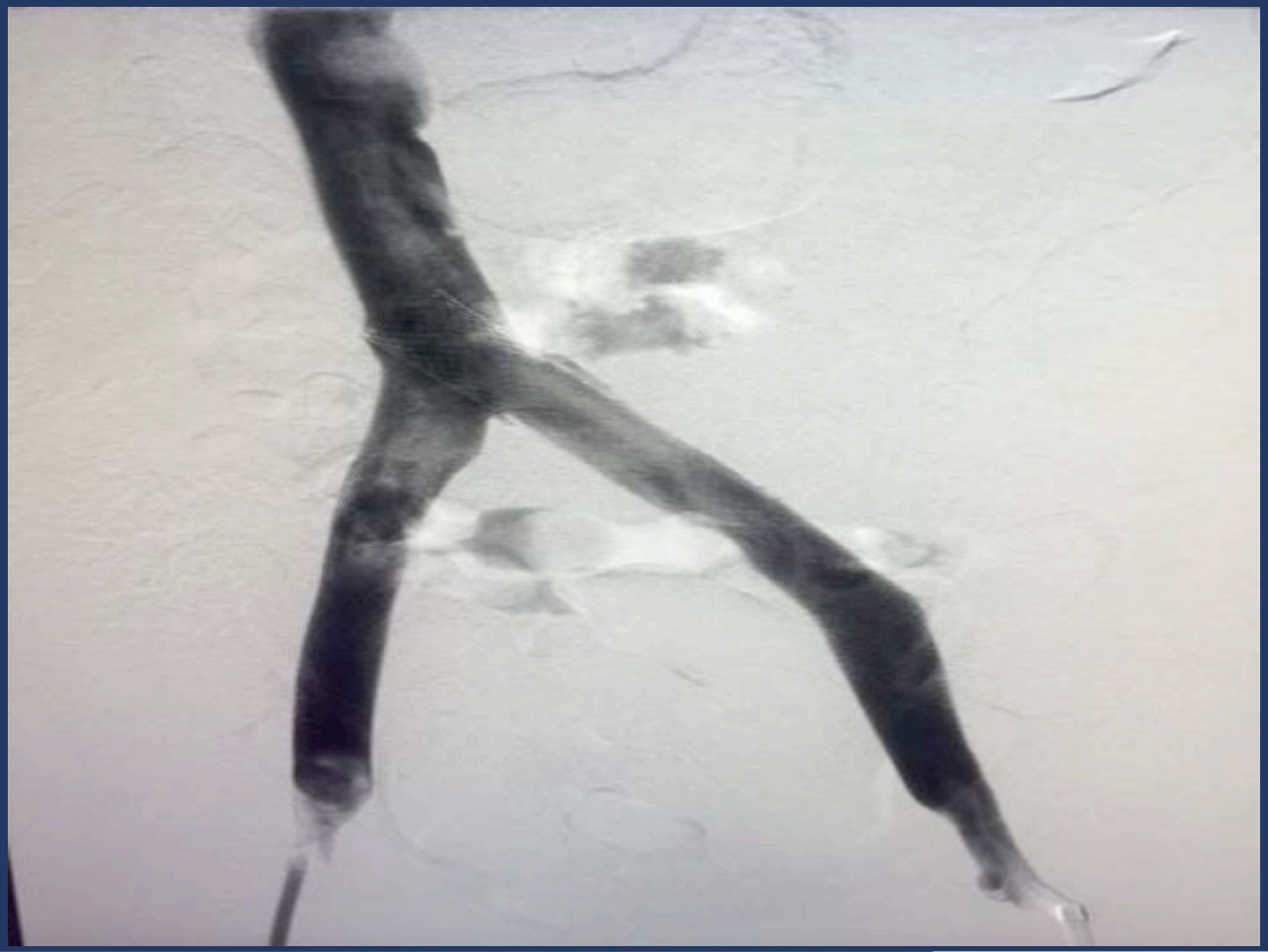
2. Meissner MH, Gloviczki P, Comerota AJ, et al. Early thrombus removal strategies for acute deep venous thrombosis: clinical practice guidelines of the Society for Vascular Surgery and the American Venous Forum. J Vasc Surg 2012;55:1449-62.

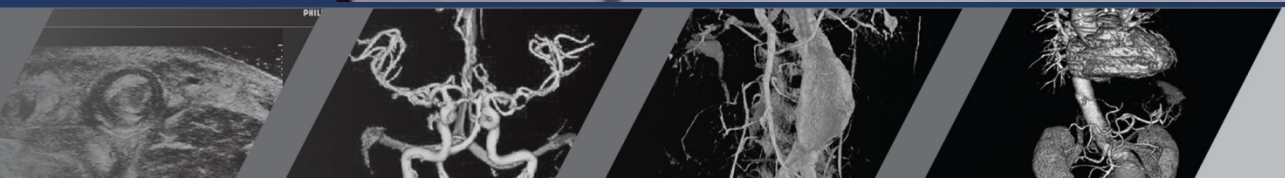
3. Neglén P, Hollis KC, Olivier J, et al. Stenting of the venous outflow in chronic venous disease: long-term stent-related outcome, clinical, and hemodynamic result. J Vasc Surg 2007;46:979-90

Stenting


Compressed
Iliac Vein
LCIV DIST REF
Before
Opened
Iliac Vein
After Stenting
LEFT POST STENT
After

Post Stenting Venogram





Conclusion

May-Thurner syndrome: a not so uncommon cause of a common condition

This anatomic finding has been shown to be present in over 20% of the population; however, it is rarely considered in the differential diagnosis of leg edema, DVT, and chronic venous disease particularly in patients with other risk factors.

Systemic anticoagulation, compression therapy, and venous ablation are ineffective or insufficient treatment, and a more aggressive approach is necessary to prevent complications

Thank You