Iliac Vein Compression: May-Thurner Syndrome

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Anatomy of the IVC Bifurcation

- In contrast to the right common iliac vein, which ascends almost vertically to the IVC, the left common iliac vein has a more horizontal course and underlies the right common iliac artery
Anatomic Definition

May–Thurner syndrome: Left common iliac vein becomes compressed by the overlying right common iliac artery against the spine.

[Diagram showing anatomical structures]
Anatomic Variants
Prevalence

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

May-Thurner is likely more common than we thought

- Patients with severe chronic venous disease (37% >50% stenosis)¹
- There are reported to be 600,000 DVT (Deep Vein Thrombosis) hospitalizations per year in the US¹
- 50-65% of DVTs occur in the left leg
- Iliac vein compression is thought to occur 18 - 69% among patients lower extremity DVT¹,²

Stages and Development of Symptoms

- **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 Examination
CEAP

- 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
Pelvic Vein Compression: May-Thurner Syndrome

Stenosis at the confluence of the left common iliac vein and IVC is at the correct location for compression by an overlying right common iliac artery: May-Thurner syndrome.

Dilated pelvic vein collaterals

Dilated left lumbar vein collateral
Current Diagnosis

- 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

Current Diagnosis

- 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”

Venography

Clue: Thinning of dye where Artery crosses the vein
Venography

Compression at Lt iliocaval junction
How does IVUS compare to single plane venography?

- 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)

IVUS: Iliac Vein Compression
IVUS: SIGNIFICANT ILIAC VEIN COMPRESSION


≥ 50% reduction in intraluminal area
IVUS: SIGNIFICANT ILIAC VEIN COMPRESSION

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

Conventional Management

• 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 (initial treatment therapy)
Invasive Management

Localized venous obstruction is a major cause of symptoms\textsuperscript{1,2}
Greater than 90\% of post-thrombotic CVI cases have obstruction\textsuperscript{3}
Collateral flow only partially prevents symptoms associated with venous disease
Stenting is “method of choice” for chronic venous obstruction\textsuperscript{2,4}

Stenting: Technical Considerations

- Iliac and inferior vena cava angiography
- Use a stiff wire for optimal support
- Use IVUS to determine proximal and distal reference diameters and stent length
- Use self expanding stents
- Stent size: 1-2 mm > proximal reference diameter to avoid stent migration
- Stent may be placed 4-5 mm into the IVC
- Perform post-stent IVUS examination
- Gentle 1:1 post-stent balloon dilatation as needed
Stent Patency

Healed Ulcers

Symptomatic Relief

POST-STENT IVUS
POST-STENT VENOGRAM
TAKE HOME MESSAGE

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