MRV and CTV In Imaging of Pelvic and Abdominal Venous Compressive Syndromes: Which Is Better and Why?

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Disclosures:
- No financial Disclosures in relation to this lecture
- The use of gadolinium chelates for MRA/V can be considered off label use.
- CTV or MRV studies are not recognized by CMS

Abdominal & Pelvic Venous Obstructive Pathologies & Syndromes
- May-Thurner Syndrome
- Other Iliac Vein & IVC Obstructions
- Nutcracker Syndrome

60 yo F with left leg swelling
- History of Ovarian Ca
Iliac Venous Compression (May-Thurner Syndrome)

Background

- In 1851, Virchow observed iliofemoral DVT 5 times more likely to occur in the left lower extremity.
- In 1957, May & Thurner provided an explanation: left common iliac vein is compressed between the right common iliac artery anteriorly and 5th lumbar vertebral body posteriorly. Compression & pulsatility produce accumulation of collagen & elastin referred to "venous spur." *

**May & Thurner. The cause of the predominantly sinistral occurrence of thrombosis of the pelvic veins. Angiology 1957;8:419-27

- High prevalence of non thrombotic iliac venous lesions in pt’s with chronic venous disease. **
- Overall prevalence of MTS is 18-49% among pt’s with LLE DVT. ***
- Predominantly females 20-40 years old.


- Time of Flight (TOF)
- 2D Fiesta (SSFP)
- Modified SSFP (Inhance)
- 3D FSPGR (3D MRA)
- Time Resolved MRV
- 2D FSPGR Post GD
- 3D Fiesta Post GD
- Intravascular CE MRV

Is Iliac Venous Compression Always Significant?

- Iliac venous compression is a frequent anatomic variant and is incidentally observed on many cross sectional studies.
- Luminal compression of the left CIV can be seen in up to 25% of asymptomatic healthy individuals.
- Compression becomes clinically significant only if it causes hemodynamic changes in venous flow or venous pressure evident by:
  - Flow reversal,
  - Presence of pelvic venous hypertensive collaterals,
  - Or if it leads to DVT.


Why CT Venography?

- Evaluate DVT in the lower extremities along with CTPA
- Evaluate Central veins- SVC, IVC, Pelvis
- Evaluate catheter associated thrombus
- Evaluate stent patency
- Vein mapping

Techniques for CTV

- **Indirect CTV** (recirculation)
  - Injecting upper extremity vein
  - Allowing first pass through the arterial tree
  - Imaging venous system during venous phase
  - 150cc IV contrast and delay 90-160 sec

- **Direct CTV**
  - Injecting extremity of choice
  - 50-60mgI/ml (1/4th - 1/5th dilution 300mgI/ml)
  - 3ml/sec with ankle tourniquet
  - Delay 60-90 seconds
  - Scan foot to pelvis
Direct left LE and Pelvic CTV

Direct vs Indirect CTV
Stent Surveillance S/P Lysis of Iliofemoral DVT

Catheter Directed CTV
Surveillance of MTS Stent

Other Iliac Venous & IVC Obstructions

60 YOM pancreatic cancer and acute bilateral lower extremity edema
Non invasive imaging should be used for workup of patients with clinical suspicion of abdominal & iliac venous compression.

- Duplex Doppler ultrasound is usually the first modality to screen/confirm for iliocaval obstruction.
- TOF assists in determining hemodynamic significance of MTS.
- Catheter directed CTV provides a more accurate method to interrogate iliocaval stent patency.

Thank You!