Cone Beam CT v IVUS in Iliac Venous Stenting

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Disclosures

• Paid consultant to
  – Cook Medical
  – Optimed
  – BSCI
  – Medtronic
  – Straub
  – Marvao

Cone Beam CT

• Available on most modern Interventional Suites
• Is it relevant in Iliac Venous Intervention??
• Has largely replaced CT for most image guided interventional procedures
  – Biopsy
  – RFA
  – Drainages

So Cone Beam is similar but lower quality than CTV

SAME PATIENT
CTV @ 6/52
So Cone Beam is similar but lower quality than CTV
**IVUS: Intra-Vascular Ultrasound**

- Beloved by the Gods (Raju/Neglen)
- Provides unparalleled intra-vascular imaging
- Optical Coherence Tomography (OCT) is its counterpart in coronary
- Unequivocally superior to single plane fluoroscopy
- Quick/radiation free/allows measurement


**Cone Beam CT**

- **PROS**
  - Cost option on most modern IR suites
  - Multi-functional—replaces CT for biopsies etc.
  - Means you can stay in one room for the working day
  - Allows angled access to structures
  - Immediate assessment of position/stent expansion
  - “Familiar” anatomy

- **CONS**
  - Extra 100k for this option
  - Not as accurate as CT for very precise interventions
  - RADIATION DOSE
  - If CT venography required need to inject contrast repeatedly
  - Limited field—usually need 2 scans to cover CFV to IVC

**IVUS**

- **PROS**
  - Very accurate
  - Immediate
  - Allows measurement of stent dimensions
  - Enables visualisation of what is inside stent
  - Base machine can be used in peripheries/coronaries
  - Delicate structures can be visualised better by IVUS, for example, septa, trabeculations, intra-stent restenosis and outside structures impacting on the vein

- **CONS**
  - Some anatomical re-orientation required
  - Cost of machine
  - Cost of EACH catheter
  - 9f sheath (irrelevant)
  - Prone to occasional artefact (air)

**Galway experience CBCT**

- 2013
- Cone Beam CT
- Siemens Artis Q with GigaBit Q spot
- Top of the Line
- Extremely accurate
- I haven’t done a biopsy/RFA/drainage in “CT” in > 2 years
Galway experience IVUS

- Started early 2014
- Initially pretty sceptical
- Gradually have learned to appreciate it
- Re-read Raju/Neglen’s work
- Learnt a lot about:
  - Stent compression
  - Stent dimensions
  - Intravascular anatomy
  - Intravascular “debris”

IVUS Technique

- U/S guided percutaneous vein access
- Below the suspected obstruction
- Guidewire and sheath inserted
- Coaxial or monorail tracking
- Around 10 MHz frequency
- Catheter advance to highest point of interest and then images acquired during withdrawal

What’s special with IVUS?

- Visualizes vessel lumen from inside out and penetrates adjacent structures, not a “shadow-o-gram” like venogram
- Gives full 360° view of crosscut vessel lumen
- Locates side branch or collateral vessels
- Reveals character of wall and external structures, incl. accompanying and crossing arteries

Intravascular Ultrasound (NIVL = nonthrombotic iliac vein lesion)

Take Home points:

- Cone Beam CT and IVUS are complimentary
- For ILIAC VENOUS STENTING I think IVUS is more useful
- For general hospital work CBCT is more useful
- Ideally get both!!