Disclosures

• No Disclosures

• All venous stenting is currently off label
Spectrum of Chronic Venous Disease
Local procedures:
Sclerotherapy
Phelbectomy
+/- GSV Ablation
Spectrum of Chronic Venous Disease

EVALUATE FOR VENOUS OBSTRUCTIVE DISEASE

CEAP 3: Edema
CEAP 4: Hyperpigmentation and Lipodermatosclerosis
CEAR 5: Healed Ulcers
CEAP 6: Active Ulcers
Chronic venous obstructive disease

Primary
May Thurner Disease

Secondary
Post-thrombotic

Advanced C3-C6 Disease
90% have obstructive component!!!
Diagnosis

- Venography only has a 50% sensitivity
- Redefining Duplex US criteria to detect underlying stenosis
- CTV/MRV fairly accurate when radiologists are familiar with pathology – most read as normal.
- Gold standard: Intravascular US – sensitivity 85%
Iliac Vein Stenting

Procedure:

• Thigh access
• Imaging: Venogram + IVUS
• Pre-dilation
• Stenting
• Post-dilation
• Post Imaging: venogram + IVUS
Thigh Access

Femoral vein - upper 1/3 of thigh

Ultrasound guidance – lateral/below femoral artery

Enough running room to treat as low as lesser trocanter
Initial Venogram

Provide information on patency, collaterals and flow

- **Occlusion**
- **Collaterals**
- **Pancaking**
- **Lead Pipe**

Sensitivity of Venography for identification of iliac lesions ≈50%

+ Findings -> Helpful
- Findings -> Do NOT r/o disease
Gold Standard: Diagnostic Sensitivity of IVUS is 85%

Determine degree of stenosis compared to anatomic normals

NOT ADJACENT SEGMENTS!

CIV:  16 mm  ->  200 mm²

EIV:  14 mm  ->  150 mm²

CFV:  12 mm  ->  125 mm²
Intravascular Ultrasound

Normal CIV: 200mm²
CIV (PTS): 67 mm²
Degree of Stenosis: 67%

Normal CIV: 200mm²
CIV (PTS): 50 mm²
Degree of Stenosis: 75%
In rare cases lesions may be missed by IVUS (15%)

Usually at bifurcations – probe not coaxial to lumen

Often appears as missing border

Occasionally will miss webs

Low pressure compliant balloon will identify missed stenoses
IVUS Determination of landing zones

Must stent to healthy vein!

- Cannot be determined by venogram
- Proximally: Identify iliac confluence
- Distally: Ok to cross the inguinal ligament

• Understenting is most common cause of re-occlusion!!
Pre-Dilate

Large 18 mm balloons

High pressure inflation – 14 – 16 mmHg pressure

Same balloon all segments

If wasting – hold 1-2 minutes
Stenting

- Self expanding braided stainless steel stents
  - Large stents – 18 mm
  - Must stent to healthy vein!
  - Ok to cross inguinal ligament
  - Understenting causes occlusion!
Almost impossible to correct!

Normal CIV: diameter 16 mm = area 200 sq mm ($\pi r^2$).

14 mm stent = 24% stenosis

12 mm stent = 34% stenosis

10 mm stent = 60% stenosis

These are much worse if the stent develops some degree of ISR—up to 25% is common.
Z-stents: Anchor wall-stents
Z-Stents – Facilitate future contralateral stenting
Z-Stents – Prevent contralateral Jailing/DVT
Post IVUS and Venogram

Post - Dilate

Final IVUS

Final Venogram
Post-operative Anticoagulation

Aspirin for stent maintenance

Long-term anticoagulation

- Unprovoked DVT
- Recurrent DVT
- Thrombophilia
Results

Pre-Area EIV 66

Pre-Area CIV 76
Results

Post-Area EIV 178

Post-Area CIV 205
Patency – Recanalized thrombotic occlusion

- Primary
- Assisted-primary
- Secondary

Patency Rates (%)
- 74%
- 68%
- 54%

Months
- 0 6 12 18 24 30 36 42 48
Cumulative Relief of Pain and Swelling

After Stenting with Uncorrected Reflux

- Pain - Complete and partial relief (Reduction ≥ 3 on VAS)
- Pain - Complete relief
- Swelling - Complete and partial relief (improvement ≥1 degree)
- Swelling - Complete relief

Months
Cumulative Symptom Relief (%)
Results
Conclusions

Happy Patients!