Can You Predict Venous Severity Based On Reflux Time?

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Disclosures

• Scientific Consultant
  – Veniti/Boston Scientific
  – Inari Medical
  – Tactile Medical

• Clinical Trial Investigator
  – Factor Therapeutics, Avadam

What are the determinants of venous severity?

• Reflux Volume
  – Time
  – Velocity
  – Diameter of vein in which reflux occurs

• Obstruction
  – How critical is the vein that is obstructed?
  – How severe is the obstruction?

Measured VFT using air plethysmography
Compared times to reflux time in GSV
Correlation between VFT and RT:
  \[ R^2 = 0.72 \]

Does Venous filling index depend on vein size?

• Lattimer et al
• Correlated VFI on APG to GSV diameter and CEAP clinical class
• Larger GSV diameter significantly associated with worsening VFI
  \[ R = 0.623 \]
  \[ P < 0.0005 \]
• Compared saphenous diameter, reflux velocity and time as predictors of CEAP clinical classification
• N = 300 patients
• Correlation between RT and clinical severity WEAK
• Reflux time good parameter for ID of reflux
  – NOT for quantifying severity of reflux
• Velocity and peak flow correlated better with disease severity

Case: Mixed venous disease
53 YO female
H/o severe edema
Previous ulceration
Induration, pain
CEAP clinical class 5

Vein segment mapping with reflux studies: example 2

<table>
<thead>
<tr>
<th>VEIN EXAMINED</th>
<th>RIGHT</th>
<th>LEFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Femoral Vein</td>
<td>2.5 sec</td>
<td></td>
</tr>
<tr>
<td>Femoral Vein</td>
<td>0.3 sec</td>
<td></td>
</tr>
<tr>
<td>Popliteal Vein</td>
<td>2.2 sec</td>
<td></td>
</tr>
<tr>
<td>Great Saphenous (femoral junction)</td>
<td>4.5 sec</td>
<td></td>
</tr>
<tr>
<td>Great Saphenous (knee)</td>
<td>5.0 sec</td>
<td></td>
</tr>
<tr>
<td>Small Saphenous</td>
<td>0.1 sec</td>
<td></td>
</tr>
</tbody>
</table>

Deep and superficial venous insufficiency

All reflux is not equal

The importance of Deep Venous Reflux Velocity as a Determinant of Outcome in Patients with Combined Superficial and Deep Venous Insufficiency Treated with Endovenous Saphenous Ablation

William Marston MD, Wells Brabham MD, Daniel Berndt BS, Robert Mendes MD, Blair Keagy MD


Improvement in VFI and VCSS dependent on MRV in deep veins
Is this saphenous vein really the cause of symptoms?

- Reflux velocity at 0.5 sec = 2 cm/sec

Can You Predict Venous Severity Based on Reflux Time?

- Not by itself
  - Reflux Time
  - Reflux velocity
  - Vein size
- It's all about the flow