Technical aspects for endovascular reconstruction of chronic venous stenosis

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Disclosures

Speaker name:

Michael Lichtenberg

I have the following potential conflicts of interest to report:

- Consulting (CR Bard, Biotronik, COOK, Optimed, Straub Medical, Terumo, Volcano, Boston)
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest
What is important

A VEIN IS NOT AN ARTERY

Totally different hemodynamic
Influencing clotting defects
Influencing compression syndromes
Requires understanding of venous disease
Mechanism of re-occlusion is totally different
Venous outflow obstruction

webs, spurs, chords
May-Thurner Syndrome

It causes between two and five percent of lower-extremity venous disorders. May–Thurner syndrome is often unrecognized; however, current estimates are that this condition is three times more common in women than in men. The classical syndrome typically presents in the second to fourth decades of life. In the 21st century in a broader disease profile, the syndrome acts as a permissive lesion and becomes symptomatic when something else happens such as, following trauma, a change in functional status such as swelling following orthopaedic joint replacement.

Diagnostic approach

- Duplex ultrasound (aliasing, fibrotic tissue, CTO)
- Venous plethysmography and phlebodynamic analysis (on treadmill) could be helpful
- Venous CT angiography
- Venous MRI angiography
Intravascular Ultrasound

- Evaluation of lumen diameter and stenosis
- Evaluation of thrombus, fibrotic tissue and scar tissue
- Evaluation of compression
- Intervention without contrast dye

Peter Neglen 2002 Journal of Vascular Surgery:
„In comparison to standard venography IVUS appears to be superior for identify morphologic changes of iliac venous outflow obstruction“
IVUS vs. Angio: May-Thurner Syndrome
Recanalization tips

- Long sheaths (telescopic principle)
- Terumo stiff or half stiff guide wire
- Sometimes even exchange for superstiff guidewire
- PTA predilatation balloons (10, 12, 14, 16, 18 mm)
- Predilatation is eminent
- Standard inflation pressure is 6 – 12 atm (could be PAINFULL !!!!)
- No rupture risk!
Stent options

- Off label use in venous system
- Good radial force
- Expensive
- High flexibility
- Low radial force
- Expensive
- High flexibility

Boston, Wallstent
Optimed
Cook, Zilver
Veniti, Vici
Radial force in May-Thurner syndrome

Sinus Venous Stent

Zilver Venous Stent
First Patients Treated in Germany with VENITI(TM) VICI VENOUS STENT® System

Subtotal stenosis iliac vein

Veniti Stent 16 mm
Stent selection for different diameter

- **Inferior Vena cava (> 18 mm)**
  - Sinus XL stent (Optimed)
  - (Sinus Venous stent 18 mm)

- **Iliac veins (14 – 18 mm)**
  - Zilver Venous stent (Cook)
  - Sinus Venous stent (Optimed)
  - Veniti Vici Venous stent (max. 16 mm) (Veniti)

- **Femoral veins (< 14 mm)**
  - Zilver Venous stent (Cook)
  - Sinus Venous stent (from 10 mm) (Optimed)
Efficacy analysis of venous stents

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Stent</th>
<th>N = Patients</th>
<th>Primary Patency</th>
<th>Sec. Patency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ye</td>
<td>2012</td>
<td>Wallstent</td>
<td>205</td>
<td>98 % 48 mo.</td>
<td>100 % 48 mo.</td>
</tr>
<tr>
<td>Hartung</td>
<td>2009</td>
<td>Wallstent</td>
<td>89</td>
<td>83 % 120 mo.</td>
<td>93 % 120 mo.</td>
</tr>
<tr>
<td>Neglen</td>
<td>2008</td>
<td>Wallstent</td>
<td>177</td>
<td>86 % 72 mo.</td>
<td>93 % 72 mo.</td>
</tr>
<tr>
<td>Knipp</td>
<td>2007</td>
<td>Wallstent</td>
<td>54</td>
<td>38 % 60 mo.</td>
<td>73 % 60 mo.</td>
</tr>
<tr>
<td>Nazarin</td>
<td>1996</td>
<td>Wallstent, Palmaz</td>
<td>55</td>
<td>59-72 % 48 mo.</td>
<td>75 % 48 mo.</td>
</tr>
</tbody>
</table>

Ye K et al. J Vasc Interv Radiol 2012;23: 497-502
Hartung O et al. J Vasc Endovasc Surg 2009;38: 118-24
What to use for venous stenting

• **New stents – new design:** lack of data for efficacy, long term patency and safety

• **Wallstent** is the best documented
  
  • Proven long – term patency
  
  • Needs to protrude into the IVC, risk of contralateral thrombosis
  
  • Exact placement could be difficult because of foreshortening
Stent strategy – stent selection

DVT type

- Persistent swelling (C3)
- No PTS
- Collaterals

Compression type

- Compression syndrome
  - May-Thurner
  - Cancer, lymphocele, scar tissue, cysts
- Clinical situation
  - Persistent swelling (C3)
  - No PTS
  - Collaterals

Stent implantation in compression with high radial force
Postimplantation Treatment

• Different regimes for thrombotic and non thrombotic lesions

• No evidence data available – it is individual
  – Most recommended in CTO: 3 months anticoagulation plus Aspirin 100 mg

• Acute DVT: Duration of anticoagulation depends on guidelines for DVT

• What about new oral anticoagulation – no data!

• What about thrombophilia? – No answer!
Conclusion

• Look for proximal vein obstruction, find it and treat it
• Symptoms - CT/MRI angio and IVUS are enough tools for diagnostic approach
• Endovascular therapies are safe and effective – no more indications for open surgeries in acute DVT
• Significant improvement of QoL
• Finish your stent implantation regardless of the inguinal ligament
LIVE WEB SYMPOSIUM
www.incathlab.com
4. Februar 2015

Prof. Nils Kucher  Dr. Michael Lichtenberg  Dr. Wilhelm Stahlhoff  Dr. Narayan Karunanithy
THANK YOU FOR YOUR ATTENTION
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- Vascular Center, Arnsberg Clinic, Arnsberg, Germany

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