Chronic Ilio-caval Obstruction – Stenting the Venous Outflow

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Faculty Disclosure

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Member of SAB, AngioDynamics

Wallstents and nitenol stents are used “off-label,” e.g., the use for iliac venous stenting is not described on the product’s label.
Chronic venous disease - Obstruction or reflux?

CVI (C₃-C₆) – think obstruction
The femoro-ilio-caval vein is the final pathway for the lower extremity venous outflow.
Why think ilio-femoral obstruction?

- Venous outflow obstruction plays an important role in clinical expression of CVD, particularly pain.
- Ulcerated limbs have a high rate of obstruction (~40%).
- In limbs with obstruction, ulcers occur rarely with isolated obstruction (4%), more often in association with reflux (30%).
- Treatment results in impressive clinical relief of pain, swelling, VCSS, VDS and QoL, even when associated reflux is left untreated.
- Treatment results in healing of ulcers, despite untreated reflux, in 58-65% of the patients.

Postthrombotic iliac veins
Non-thrombotic Iliac Vein Lesion (NIVL)

- **May-Thurner or Cockett’s Syndrome** –
  - Iliac vein compression
  - Intraluminal lesions, e.g., webs, spurs, chords

- **Non-thrombotic iliac vein lesions**
  - Left/right = 3/1
  - Female/male = 4/1
  - Median age 54 years (range: 18-90)
  - Proximal and distal lesion

- **Clinical impact without previous DVT.**

Non-thrombotic Iliac Vein Lesion
The impact of iliac vein compression on acute DVT and postthrombotic obstruction

- Often underlying compression-type lesions found (left 84%, right 66%)
  

- Poor recanalization with external compression of the iliac vein (70-80% remains obstructed)
  

- Stenting of the stenosis after clot removal improves patency from 27-44% to 86-93%
  
Deleterious effects by residual postthrombotic ilio-femoral (IF) vein obstruction

- Recurrence rate of IF DVT x 2.4 higher than limited to FV
  

- 100% contralateral DVT with conservative tx of unilateral ilio-caval thrombus (if removed 7%)
  

- Proximal obstruction may lead to distal valve incompetence
  

- More severe symptoms than femoro-popliteal disease after conservative treatment, poor collateralization
  
  – 90% venous hypertension, ulcer in 15% within 5 years, decreased quality of life
  
  – Venous claudication in 15-44%, with IF stenting symptoms were eliminated

The clinical response to stenting of the IF obstruction

- Ilio-femoral venous outflow obstruction plays an important role in clinical expression of CVD, particularly pain.
  - Pain – complete relief 65% (improved 74%) @ 5 y
  - Swelling – complete relief 32% (improved 62%) @ 5 y
  - The impressive clinical relief of pain and swelling even when associated reflux is left untreated.

- Stent placement results in sustained healing of ulcers despite untreated reflux (~60% @ 5y)

# QoL-Scores (CIVIQ)

<table>
<thead>
<tr>
<th>Total score (mean±SD)</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leg pain</strong></td>
<td>3.5±1.1</td>
<td>2.6±1.2***</td>
</tr>
<tr>
<td><strong>Work</strong></td>
<td>3.5±1.1</td>
<td>2.7±1.3***</td>
</tr>
<tr>
<td><strong>Sleep</strong></td>
<td>3.2±1.3</td>
<td>2.5±1.3***</td>
</tr>
<tr>
<td><strong>Social activity</strong></td>
<td>25.1±8.4</td>
<td>21.4±9.0***</td>
</tr>
<tr>
<td><strong>Morale</strong></td>
<td>26.0±9.8</td>
<td>22.1±9.7***</td>
</tr>
</tbody>
</table>

VCSS 8.5 (range: 4-18) **↓** 2 (range: 2-3)

VDS 2 (range:0-9) **↓** 0 (range:0-2)


The response to stenting of the IF obstruction alone in combined obstructive and reflux disease
Non-thrombotic iliac vein lesion (NIVL) and primary reflux

<table>
<thead>
<tr>
<th>Cumulative outcome at 2.5 years after stenting</th>
<th>NIVL with reflux (n=151)</th>
<th>NIVL without reflux (n=181)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No pain</td>
<td>82%</td>
<td>77%</td>
</tr>
<tr>
<td>No swelling</td>
<td>47%</td>
<td>53%</td>
</tr>
<tr>
<td>Ulcer healed</td>
<td>67%</td>
<td>76%</td>
</tr>
<tr>
<td>Good/excellent outcome</td>
<td>75%</td>
<td>79%</td>
</tr>
</tbody>
</table>

Clinical Outcome after Ilio-femoral Stenting Alone in Combined Chronic Venous Disease (NIVL 37%, PTS 63%)

<table>
<thead>
<tr>
<th>Number of limbs</th>
<th>528</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4-6</td>
<td>275 (52%)</td>
</tr>
<tr>
<td>Deep reflux</td>
<td>172 (33%)</td>
</tr>
<tr>
<td>+ superficial</td>
<td>343 (65%)</td>
</tr>
<tr>
<td>+ perforator</td>
<td>100 (24%)</td>
</tr>
<tr>
<td>Axial deep reflux</td>
<td>224 (42%)</td>
</tr>
<tr>
<td>Segmental reflux score ≥3/7</td>
<td>59%</td>
</tr>
</tbody>
</table>

Cumulative rate @ 5 y

- Healed ulcer of C6: 54%
- Recurrent of C5: 12%
- Healed dermatitis: 81%
- Complete relief of Pain: 71%
- Swelling: 36%
- QoL (CIVIQ 68-53): ↑ 20%

24 limbs (5%) had valve repair

Raju & Neglén, J Vasc Surg 2010;51:401-9
## Ilio-femoral Venous Stenting

### Thrombotic Events

(982 stented limbs)

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postop (&lt;30 days)</td>
<td>1.5%</td>
</tr>
<tr>
<td>Late (median 13m, range 2-77)</td>
<td>3%</td>
</tr>
<tr>
<td>Ipsilateral stented iliac vein (n=31)</td>
<td>3%</td>
</tr>
<tr>
<td>Contralateral iliac thrombotic event (n=11)</td>
<td>1%</td>
</tr>
</tbody>
</table>

### Stent patency rates and etiology

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Patency rate</th>
<th>Duration of f/u</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary</td>
<td>Assist – Prim</td>
</tr>
<tr>
<td>All</td>
<td>67-83%</td>
<td>89%</td>
</tr>
<tr>
<td>Primary (NIVL)</td>
<td>79%</td>
<td>100%</td>
</tr>
<tr>
<td>Postthrombotic - non-occlusive</td>
<td>38-57%</td>
<td>63-80%</td>
</tr>
<tr>
<td>Postthrombotic - occlusion</td>
<td>30-70%</td>
<td>56-73%</td>
</tr>
</tbody>
</table>
Rate of In-stent Restenosis (>50%)

Stenting of the iliac venous outflow

- Is a safe procedure with low morbidity and no mortality
- Is durable long-term
- Substantially relieves symptoms
Practical Implications for Management of Chronic venous Disease

- CVD – think obstruction!
- Non-thrombotic iliac vein lesion (NIVL) is a frequent finding.
- Complement ultrasound scanning of the lower extremity with transfemoral venography, MRV, CT-V or IVUS
- **Venous stenting** - primary choice in the treatment of ilio-caval obstruction
- Venous stenting is the **initial procedure** when an iliofemoral venous obstruction is present whether or not it is associated with reflux