Venous Stents in Adolescents & Pregnancy

Mahmood Razavi, MD, FSIR, FSVM
Medical Director
Clinical Trials Center
St Joseph Heart & Vascular Institute

Disclosures

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Pediatric & Adolescent Venous Stent

Etiologies

1. Associated with cong heart dz
   - Indication is mostly for access
   - Require frequent reintervention & re-dilation
2. Post thrombotic
   - Catheter related DVT
   - Hypercoagulability
   - Post operative
   - Anatomic anomalies (IVC interruption/hypoplasia)
3. Traumatic
4. Non-thrombotic (rare ... no literature support for peds)

PTS in Children

- Symptoms & function in pediatric PTS remains poorly characterized
- Tools evaluate signs, symptoms & function (endurance)
  - CAPRSure, modified Villalta, etc

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue</td>
<td>Limb circumference diff</td>
<td>Impaired endurance</td>
</tr>
<tr>
<td>Weakness</td>
<td>Swollen limb</td>
<td>Paresthesia</td>
</tr>
<tr>
<td>Tightness</td>
<td>Skin redness</td>
<td></td>
</tr>
</tbody>
</table>

Sample Literature: Venous Stents in Pediatric Population

- Frazier JR. Cath Cardiovsc Interv 2009
  - 36 central veins in 33 patients
  - Median age 2.6 yrs (0.2-14.2 yrs)
  - 17/36 vessels occluded
  - 7/19 bail f/u catheterization; 7/17 required reintervention @ median f/u 4.1 yrs

- Agnoletti G. Eurointerv 2012
  - Central vein stents in 32 patients (23 with CHD; 9 without)
  - Median age 5 yrs (0.1-16)
  - 4 reocclusion/restenosis at a median f/u 2.9 yrs (~12%)

Sample Literature: Venous Stents in Pediatric Population

- Qureshi A. Cath Cardiovsc Interv 2016
  - Report of thrombectomy in 21 patients
  - 14 with systemic venous thrombosis
  - 4/14 received stents (3 SVC)
  - 1 pt with IPIDVT (10 yrs old)

- Gaballah M. J Vasc Inter V Radiol 2016
  - 64 limbs in 57 pts underwnt lysis for DVT
  - 4 pts received stents in iliac veins (all MT synd)
  - Mean age 18.8 yrs
  - 1/4 stents rethrombosed at median f/u 1.5 yrs
Iliac Vein Compression Syndrome in Adolescents

<table>
<thead>
<tr>
<th>Study</th>
<th>No. of Patients</th>
<th>Mean Age</th>
<th>Primary Patency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murphy et al, JVS 2009</td>
<td>5/7 under 18 years</td>
<td>13 mo</td>
<td>100%</td>
</tr>
<tr>
<td>Goldenberg NA et al, JIR 2011</td>
<td>6/16 with DVT &amp; May-Thurner</td>
<td>16 mo</td>
<td>4/6</td>
</tr>
<tr>
<td>Raffini et al, Ped Blood Cancer 2006</td>
<td>2/3 with DVT &amp; MTS</td>
<td>18</td>
<td>2/3</td>
</tr>
</tbody>
</table>

Goldman R et al. J Vasc Interv Radiol 2017, 28

PTS by Villalta score = 60%

• N = 11 (2006-2018); 10/11 hypercoagulable
  • DVT
    • Chronic occlusion: 4
    • Acute: 2
  • Lost to f/u: 2
  • Re-thrombosis: 5/9
  • 4/5 non-compliant with anticoag regimen
  • 8/9 remain patent at last f/u (median f/u time 38 m)

Post Stent Pregnancy

• Hartung O et al JVS 2009 | 8 women with post stent pregnancies
• 2 rethrombosed; 4 had stent “compression” by 3rd trimester
• Stent compressions resolved post partum

• Dasari M et al | 12 women with post stent pregnancies

Pregnancy after Iliac Vein Stent

| Study | Case No. | Treatment | Pregnancy | Maternal hypertension | Maternal complications | Maternal hypertensive<!-- | Maternal complications
---|---|---|---|---|---|---|
| Dasari M et al, JVS Ven Lymph Dis 2017 | 1 | 9 | Normal | No | No |
| | 2 | 8 | Normal | No | No |
| | 3 | 8 | Normal | No | No |
| | 4 | 8 | Normal | No | No |
| | 5 | 8 | Normal | No | No |
| | 6 | 8 | Normal | No | No |
| | 7 | 8 | Normal | No | No |
| | 8 | 8 | Normal | No | No |

Dasari M et al, JVS Ven Lymph Dis 2017
Conclusion

• Rigorous data on peds/adolescent venous stenting & pregnancy after iliac vein stenting are lacking

• What data exists shows:

• Stent patency likely parallels that of adult population

• Stent compression does occur during pregnancy but there are no sequelae