Endovascular treatment for central venous stenosis in hemodialysis patients

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Disclosure

Speaker name: **Wei Liang**

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

× I do not have any potential conflict of interest
Access is important

- Access is NO. 1 problem in hemodialysis patient
- The patency of vascular access is of vital importance for dialysis patients
Central venous stenosis (CVS)

Varicose Vein

Skin ulcer

CVS Incidence: 8.79% in HD (From 14 Hospitals in China)

BMJ Open 2015, 5
Etiology of CVS

- Central Venous Cannulation
  (temporary / permanent)
  Damage the vein

- Rate of Cannulation
  62.6% in first hemodialysis
  81% waiting for the AVF mature

*BMJ Open 2015, 5*
Etiology of CVS

• High Pressure and flow blood in venous system
  – Intimal injury
  – Hyperplasia
Open surgery for CVS

Surgical Management of Hemodialysis-Related Central Venous Occlusive Disease: A Treatment Algorithm

6M PP 66%
Access function time 9.2M

Ann Vasc Surg 2011; 25
J Vasc Surg 2008;47
Endovascular treatment for CVS

- Endovascular Surgery
  - Mini-invasive
  - Easy to practice
PTA Technique Success rate: 70-90%

At 6m: PP 23-63%  SP 29-100%
At 12m: PP 12-50%  SP 13-100%

With high pressure balloon:
At 6m PP 60%  At 12m PP 30%

Kidney Res Clin Pract 2015,34
Stent is needed:
- Immediately recoil after PTA
- Refractory lesion after PTAs

- Low PP
- High SP
# Our Experience – Renji Hospital


<table>
<thead>
<tr>
<th>25 cases</th>
<th>AVF 20, AVG 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>63.5Y (37-86)</td>
</tr>
<tr>
<td><strong>Male/Female</strong></td>
<td>14/11</td>
</tr>
<tr>
<td><strong>Duration of hemodialysis (M)</strong></td>
<td>38.7 ± 22.2 (6-70)</td>
</tr>
<tr>
<td><strong>Past CV Cannulation</strong></td>
<td>18 (72.0%)</td>
</tr>
</tbody>
</table>
## Our Experience – Renji Hospital

### Clinic Manifestation

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Edema</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Pigment</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Varicose vein</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Skin Ulcer</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
## Our Experience – Renji Hospital

### Lesion Location

<table>
<thead>
<tr>
<th></th>
<th>Right (13)</th>
<th>Left (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ceph-Sub</td>
<td>Sub+ BC</td>
</tr>
<tr>
<td>Steno.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Occl.</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

*Ceph: Cephalic Vein, Sub: Subclavian Vein, BC: brachiocephalic Vein*
## Our Experience – Renji Hospital

### Technique

<table>
<thead>
<tr>
<th>Technique</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Access: upper arm vein puncture OR Femoral vein puncture</td>
<td>7</td>
</tr>
<tr>
<td>Dual Access: Upper arm vein + Femoral vein puncture</td>
<td>18</td>
</tr>
</tbody>
</table>
## Our Experience – Renji Hospital

### Results

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Technique Success</td>
<td>21/25 (84.0%)</td>
</tr>
<tr>
<td>Only PTA</td>
<td>9/21 (42.9%)</td>
</tr>
<tr>
<td>BMS</td>
<td>12/21 (57.1%)</td>
</tr>
<tr>
<td>Length of Stent (mm)</td>
<td>86 (60-130)</td>
</tr>
<tr>
<td>Symptoms Relief</td>
<td>21/21 (100%)</td>
</tr>
<tr>
<td>Complications</td>
<td>0</td>
</tr>
</tbody>
</table>

3 failed cases: 2 involved SVC, 1 Sub+BC long lesion
Our Experience – Renji Hospital

• Medications
  • Anticoagulant during angioplasty
  • Antiplatelet (Plavix 75mg/D) for all life
## Our Experience – Renji Hospital

<table>
<thead>
<tr>
<th>Follow-up</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Period (M)</td>
<td>14.6±9.2 (3-30)</td>
</tr>
<tr>
<td>Follow-up rate</td>
<td>20/21(95.2%)</td>
</tr>
</tbody>
</table>

Angiography: 3, 6, 12M after OP (Restenosis > 50%)
Symptom, function of AV access
## Our Experience – Renji Hospital

### Patency - Angiography Results

<table>
<thead>
<tr>
<th>Time</th>
<th>Primary Patency</th>
<th>Secondary Patency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PTA</td>
<td>PTA+Stent</td>
</tr>
<tr>
<td>3M</td>
<td>62.5%</td>
<td>91.7%</td>
</tr>
<tr>
<td>6M</td>
<td>25.0%</td>
<td>50.0%</td>
</tr>
<tr>
<td>12M</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Time of re-intervention(M): 6.2 (2-12)
Typical Case-1

- Male, 51yrs
- Right upper arm varicose vein and edema for 1 year
- Right AVF for 5 years
Typical Case-1
Typical Case-1
Typical Case-1

- Right cephalic V puncture
- 7F 55cm Cook sheath
- 5F Vertibral Cath & Stiff Terumo wire(0.035)
Typical Case-1

- Admiral 10*40mm
Typical Case-1

- Stent (Cordis 14-60)
Typical Case-1

- P3 (12-40) Post-dilation
Typical Case-1
Typical Case-2
Stent Restenosis( P.O. 8M)
Conclusions

- CVS is a critical problem for HD
- Endovascular is safe and effective
- Stent+PTA may need in difficult cases
- Restenosis is popular after treatment
- Follow-up is important
- Re-intervention is easy and effective
Thank You!

Better Endo, Better Access
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