DVT — Case planning, Technique, Clinical outcome

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Tien-Yu Wu
Interventional Cardiologist
Chief, Peripheral Vascular Department and Center of Shin Kong Wu Ho-Su Memorial Hospital
Disclosure

Speaker name: Tien-Yu Wu

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
Incidence: 1/1000 ~ 350,000 to 600,000/year

Virchow’s triad
Mechanism

Ir-reversible

Treatment
Increasing Awareness


Definition

Thrombus transformed with the times

- Acute: < 14 days
- Sub acute: 14 days to 3 months
- Chronic: > 3 months
**Venous Pressure at Foot Level**

Evidence for impaired ability of calf pump to reduce ambulatory venous pressure in CVI

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<th>Supine</th>
<th>Standing</th>
<th>Ambulatory</th>
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<tbody>
<tr>
<td>Controls</td>
<td>7 ± 1</td>
<td>90 ± 7</td>
<td>35 ± 9</td>
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<tr>
<td>Saph venous</td>
<td>7 ± 1</td>
<td>87 ± 5</td>
<td>56 ± 11</td>
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<tr>
<td>incompetence</td>
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<tr>
<td>Acute thrombosis</td>
<td>17 ± 7</td>
<td>93 ± 4</td>
<td>90 ± 18</td>
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<td>PTS</td>
<td>12 ± 5</td>
<td>90 ± 4</td>
<td>84 ± 16</td>
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Ambulation induces greater drop in venous pressure in controls than in pts with chronic venous insufficiency. Impaired ability of calf pump to reduce

No drop in venous pressure if there is obstruction in addition to reflux

Husni EA et al. JAMA 1970;214:1456
Valve incompetence and Outflow obstruction
Outflow obstruction

Incompetence valve

Venous Hypertension

Chronic Venous Disease
Acute DVT

• Open vein theory
  • Remove the clot, save the valves and decompression
  • Correct possible morphological problem (IVUS)
Type of CDT and PMT

- Infusion catheter
- EKOS system
- Aspirex
The 87 y/o lady with symptomatic extensive left DVT
Chronic DVT

• Decompression
L’t CFV to iliac vein occlusion

Final Result
F/U 6 months later
Current stent in iliac vein

Right common iliac artery

Left common iliac vein

Spine

Wall stent

Nitinol stent
Wall stent vs Nitinol stent
Wall stent vs Nitinol stent
Artery Nitinol Stent
VENOVO Venous Stent

BD Venous stent
Radial Force, Crush Resistance and Flexibility

- **Radial Resistive Force**
  - Bard Venovo 14x160 (N=20)
  - Optimized Sinus Venous 14x80 (N=3)
  - Cook Zilver Vena 14x100 (N=2)

- **Crush Resistance**
  - Bard Venovo 14x160 (N=20)
  - Optimized Sinus Venous 14x80 (N=3)
  - Cook Zilver Vena 14x100 (N=3)

- **3 Point Bending Stiffness**
  - Bard Venovo 14x160
  - Optimized Sinus Venous 14x80
  - Cook Zilver Vena 14x100
VENOVO Stent
Total 38 patient 62 VENOVO stents. The patient remain symptom free and no signs of venous hypertension.

### Table

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IVUS Guide Iliac Vein Stenting
(2012-2016, 22+ months mean follow-up)

Procedure successful rate 100 %

Tien-Yu Wu et al. paper submitted
Numbers of Stent Occlusion

OBSTRUCTION OR NOT

N(68) 91%

Y(7) 9%

Obstruction Time (month)

Average = 2.26 month, Standard Deviation = 2.29 month
Primary Patency

Patency Rate

Patency = Duplex study + free from clinical symptom

Tien-Yu Wu et al. paper submitted
## Risk factor vs stent occlusion

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<tr>
<th>Risk Factor</th>
<th>(A) Obstruction</th>
<th>(B) Not Obstruction</th>
<th>T Statistic (One tailed T test)</th>
<th>P-value (One tailed T test)</th>
<th>Significant (α=0.05)</th>
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<td>Height</td>
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<td>Weight</td>
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<td>CRP</td>
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<td>2.222</td>
<td>-0.341</td>
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<td>Protein C</td>
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</table>

Tien-Yu Wu et al. paper submitted
Symptom improvement

Average CEAP reduction: 2.66
Conclusion

• Treating venous disease is really different to artery disease.

• Venous hypertension is the treatment target
  • Acute: Clot removal, vessel and valve preserve
  • Chronic: Decompression
Thank You!
DVT — Case planning, Technique, Clinical outcome

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Chief, Peripheral Vascular Department and Center of Shin Kong Wu Ho-Su Memorial Hospital

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