Dual session therapy: Catheter-directed thrombolysis to treat acute iliofemoral DVT

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Disclosure

Speaker name: Christian Erbel

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)

X I do not have any potential conflict of interest
Acute DVT

• 1% of the adult population develop an acute DVT during life.
• Incidence 1.6/1000 per year.
• 0.2/1000 non-lethal and 25,000 lethal pulmonary embolism.
• Up to 50% develop an PTS.

SOX Trial 2014, Lancet
INTERVENTIONAL TREATMENT

Prevention of pulmonary embolism and development of a PTS
Catheter-directed thrombolysis

Advantage:

- Large pulmonary embolus burden
- Below the knee involvement
- Achieves higher local concentrations

Drawbacks:

- Thrombolytic drugs – bleeding risk
- Treatment duration – Coronary Care Unit
Multicentre, randomised clinical trial

209 patients with iliofemoral thrombosis

First thrombosis

Symptom duration < 21 days

Primary endpoint: PTS after 24 months, patency after 6 months
209 patients included

101 allocated additional CDT
- 4 withdrew from study before CDT
- 4 did not meet eligibility criteria
  - 2 with exclusion criteria
  - 2 without inclusion criteria
- 93 started additional CDT procedure
  - 2 technical failures
  - 1 distal femoral DVT at start of CDT did not receive alteplase
- 1 withdrew from study follow-up
  - 2 deceased
  - 1 from cancer

90 included in ITT analysis

108 allocated standard treatment
- 108 received standard treatment
  - 1 received additional systemic thrombolysis due to acute PE
- 4 withdrew from study follow-up
  - 5 deceased
    - 4 from cancer

99 included in ITT analysis
<table>
<thead>
<tr>
<th></th>
<th>Additional catheter-directed thrombolysis (n=90)</th>
<th>Standard treatment only (n=99)</th>
<th>p value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>% (95% CI)</td>
<td>n</td>
</tr>
<tr>
<td>Post-thrombotic syndrome at 24 months†</td>
<td>37</td>
<td>41.1% (31.5–51.4)</td>
<td>55</td>
</tr>
<tr>
<td>Iliofemoral patency at 6 months††</td>
<td>58</td>
<td>65.9% (55.5–75.0)</td>
<td>45</td>
</tr>
<tr>
<td>Post-thrombotic syndrome at 6 months§</td>
<td>27</td>
<td>30.3% (21.8–40.5)</td>
<td>32</td>
</tr>
</tbody>
</table>

Post-thrombotic syndrome defined as Villalta score of 5 points or higher. *χ² test. †Co-primary outcomes. ‡Five patients had inconclusive patency assessments and one was lost to follow-up at 6 months. §Secondary outcome.

Table 2: Short-term and long-term outcomes
CaVent Trial

- Quality of life – no difference between the groups
- Severe PTS – only 1 patient in the study
- Stent rate – only 15%
- Safety: 20 bleeding complications, 3 major bleedings, no death or cerebral bleeding
Case report

• 37-year old woman
• Chest Pain Unit
• Swelling, pain and paresthesia of the left lower limb for 1 day
• No suspected pulmonary embolism
• No relevant additional diseases

• **Ultrasound:** Massive thrombotic burden of the left common and external iliac vein as well as common femoral vein.
Day 1 → CDT → Day 2

Patient lies prone

External Iliac vein

Common femoral vein

Common Iliac vein

Vena cava

May-Thurner Syndrom
May-Thurner Syndrom

frontal section

Cross section

compression

Right common iliac artery

Left common iliac vein

Right Common iliac artery

Left common iliac vein

Spine

ispub

pinterest
Patient lies prone

External Iliac vein

Common femoral vein

Common Iliac vein

May-Thurner Syndrome

Vena cava

CDT

Day 1 → CDT → Day 2

Would you stop the intervention now??
Indication for stent implantation

• No well defined criteria
• IVUS?
• Luminal narrowing of more than 50%
• Absent antegrade flow
• Presence of collateral flow
Ultrasound-Assisted Versus Conventional Catheter-Directed Thrombolysis for Acute Iliofemoral Deep Vein Thrombosis
Kucher N, 2015

- Single centre, randomized, open label
- 48 patients with symptomatic iliofemoral thrombotic occlusion
- Treatment with local lysis or catheter directed thrombolysis
- Stent rate >80%
- Primary patency >96% after 3 months
- Villalta Score 2.5 after 3 months
Safety and Effectiveness of Stent Placement for Iliofemoral Venous Outflow Obstruction

Meta-Analysis – 2869 patients

Razavi et al 2015

AT - indicates acute thrombotic-CDT+PTA+Stent;
CPT - chronic post-thrombotic;
NT - nonthrombotic
Outcome

80% asymptomatic
Ulcer healing in 80%

AT - indicates acute thrombotic;
CPT - chronic post-thrombotic;
NT - nonthrombotic
### Additional studies

<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>Drug</th>
<th>Dosage</th>
<th>Major bleeding</th>
<th>Patency 5y</th>
<th>Patency 1y</th>
<th>Add. proced.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Copenhagen study 2010</td>
<td>103</td>
<td>rt-PA</td>
<td>1.2mg/h</td>
<td>1.5%</td>
<td>80%</td>
<td>70%</td>
<td>55%</td>
</tr>
<tr>
<td>The Maastricht study 2013</td>
<td>37</td>
<td>rt-PA</td>
<td>1mg/h</td>
<td>1 pat.</td>
<td>70%</td>
<td>70%</td>
<td>54%</td>
</tr>
<tr>
<td>The Bern study 2014</td>
<td>87</td>
<td>rt-PA</td>
<td>20mg/15h</td>
<td>1 pat.</td>
<td>87%</td>
<td>87%</td>
<td>83%</td>
</tr>
<tr>
<td>Park/So, 2015</td>
<td>56</td>
<td>urok.</td>
<td>30,000/h</td>
<td>0 pat.</td>
<td>78%</td>
<td>78%</td>
<td>100%</td>
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</table>

Bækgaard et al. Eur J vasc Endovasc Surg 2010  
Strijkers et al., Venous and lymphatic disorders 2013  
Engelberger et al., Thrombosis and haemostasis 2014  
Park C, Vasc Specialist Int., 2015
Conclusion

Dual session therapy: Catheter-directed thrombolysis to treat acute iliofemoral DVT:

• Local lysis alone
  • is effective in resolving the massive thrombotic burden,
  • leave the potential underlying reason behind, and
  • increases bleeding risk with only modest results

• Combination of CDT plus PTA and Stent implantation resulted in a better patency and seem to reduce the risk for a PTS
Venous Intervention Center Heidelberg
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