5-year follow up for acute DVT patients treated with EKOS™: experience from Aachen University Hospital

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Disclosure

I have the following potential conflicts of interest to report:

▪ Receipt of grants/research support
  Medtronic, BD BARD, Cook, Ab medica, Bentley, Optimed, BTG

▪ Receipt of honoraria and travel support
  Medtronic, BD BARD, Cook, Ab medica, Bentley, Optimed, BTG
Introduction

- 20-55% of pt’s develop PTS after DVT
- PTS due to deep venous Thrombosis:
  - Calf: rare
  - Popliteal: rare
  - Femoral: common
  - Iliac/caval: common
- only 20 % of thrombosed iliac veins completely recanalize with anticoagulant therapy
- 44% claudication 5 years post iliac DVT
- 15% ulcers 5 years post iliac DVT
- the presence of residual thrombus in the iliofemoral distribution is a strong predictor of recurrent thrombosis and development of PTS
Introduction

• Reasons for early clot removal:

  • Relief of acute symptoms
    • Swelling
    • Pain
    • Edema

  • Risk reduction for rethrombosis and postthrombotic syndrome (PTS)
    • residual thrombus
    • residual venous obstruction
    • valve incompetence
Indication

• Acute proximal iliofemoral and caval DVT without high risk of bleeding
Anatomy

- Com. iliac vein
- External iliac vein
- Ing. lig.
- Com. fem. vein
- G. saph. vein
- Deep fem. vein
- Femoral vein
Anatomy

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Device

- **EkoSonic® Endovascular System**: ultrasound-accelerated catheter-directed thrombolysis (UACDT)

- **Mechanical**: high frequency, low energy ultrasound

- **Drug**: recombinant tissue plasminogen activator
  - Bolus 5mg, 1mg per hour
  - Heparin PTT 40-60 seconds
Case 1

Initial angiogram

Day 1
Case 1

Day 2

completion angiogram
Case 2

After ca. 24 h lysis

Predilatation
Case 2

Stenting
Case 3
Case 3
Case 3

24 h lysis
Case 3

48 h lysis
Case 3

Stenting
## Demographics

<table>
<thead>
<tr>
<th>No. of patients</th>
<th>107</th>
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</thead>
<tbody>
<tr>
<td>Sex</td>
<td>72 (68%) female</td>
</tr>
<tr>
<td>Age</td>
<td>31 (16-73)</td>
</tr>
<tr>
<td>Thrombophilia</td>
<td>(39) 36,5%</td>
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<tr>
<td>MTS (assessed without IVUS)</td>
<td>40 (37,4%)</td>
</tr>
<tr>
<td>Oral contraceptiva</td>
<td>12 (11,2%)</td>
</tr>
<tr>
<td>Prolonged Immobilization</td>
<td>9 (8,4%)</td>
</tr>
<tr>
<td>Recurrent DVT</td>
<td>8 (7,5%)</td>
</tr>
<tr>
<td>Involvement of IVC</td>
<td>20 (18,7%)</td>
</tr>
<tr>
<td>Idiopathic</td>
<td>16 (15%)</td>
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</tbody>
</table>
### Treatment aspects

<table>
<thead>
<tr>
<th>Duration of lysis (h)</th>
<th>54 ±18</th>
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<tbody>
<tr>
<td>Successful lysis</td>
<td>93 (86.9%)</td>
</tr>
<tr>
<td>Patients stented</td>
<td>82 out of 92 (88.2%)</td>
</tr>
<tr>
<td>Number of stents / patient</td>
<td>1.3</td>
</tr>
<tr>
<td>Follow up (m)</td>
<td>31.8 ±15.7</td>
</tr>
</tbody>
</table>
| Type of anticoagulation | Vitamin K antagonist (28.3%)  
Rivaroxaban 67 (67.7%)  
Apixaban 4 (4%) |
Patency rates
Complications

- Major bleeding: 2 (1.9%)
- Minor bleeding (puncture side): 15 (14%)
Incidence of PTS (Villalta score)

- Successful treatment group (93) 71 (80%) free of PTS
- Unsuccessful group (14) 6 (42%) free of PTS

- 0–4: No PTS
- 5–9: Mild PTS
- 10–14: Moderate PTS
- 15–33: Severe PTS
Conclusion

- UACDT is safe, feasible, and shows good patency rates
- Stentangioplasty is necessary in > 80% of cases
- UACDT does reduce the occurrence of PTS in patients with acute proximal DVT
- UACDT does reduce the severity of PTS in patients with acute proximal DVT
- Major bleeding still is a problem
Conclusion

As physicians we must continue to advance the field of venous intervention and not accept a 55% rate of PTS for our patients with acute proximal DVT.
Thank you very much

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