Mechanical/ pharmacomechanical thrombectomy for acute DVT

Jorinde van Laanen
Deep Vein Thrombosis

Life-time incidence of 2.5-5.0%

Development of **Post Thrombotic Syndrome** in 40-60%

Increased risk in iliofemoral thromboses

- Negative impact on Quality of Life
- Increased health care costs

Post Thrombotic Syndrome

Venous hypertension due to
• Venous obstruction
• Valvular reflux

Open vein theory
Treatment potential of early thrombus removal
• Restore patency
• Preserve valve function

# Early thrombus removal

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Complete lysis</th>
<th>Major Bleeding</th>
<th>PTS</th>
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<tbody>
<tr>
<td>Oral anticoagulant therapy</td>
<td>2%</td>
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<td>27-89%</td>
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<td>Mechanical thrombectomy</td>
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CDT and UACDT
CDT and UACDT
**Reduction PTS?!**

- Newer techniques improve lysis
- RCT’s (UA)CDT versus conservative treatment no significant difference PTS
- Successful lysis → reduction severe PTS
- Improvement outcome
  - Patient selection
  - Optimising timing/hospital logistics
  - Reduction complications/ early withdrawal intervention
  - Optimising thrombus removal devices
  - Additional stenting/ long term open vein
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- Combined with CDT

- Mechanical thrombectomy

  - 98%
  - 1-2%

Pharmacomechanical thrombectomy

Rheolytic devices
Mechanical thrombectomy

Aspiration and rotational devices
Multiple runs
No thrombolytics
Case

- F, 49 years
- No medical history
- 3 days pain and swelling left leg
- Duplex iliofemoral DVT
- Intervention versus conservative therapy
- Shared decision
Intervention
Intervention
Intervention
Pharmacomechanical thrombectomy versus thrombolysis

Comparative studies

• Lower risk major bleeding
  ➢ Significant reduction transfused RBC 0.2 vs 1.2

• Less/no thrombolytics
  ➢ Duration urokinase therapy mean 26.3 vs 48 hours
  ➢ Mean urokinase dose 2.7 vs 5.6 million units

• Shorter hospital stay
  ➢ 4.6 vs 8.4 days

• Shorter ICU stay
  ➢ 0.6 vs 2.4 days

• No significant differences venous patency and symptom improvement

Lin et al., Am J Surg 2006
Kim et al., Cardiovasc Intervent Radiol 2006
Mechanical thrombectomy

- Thrombus age less important (collagen)
- When contraindication for thrombolytics
- Often additional CDT needed
- Blood loss during intervention
- Hemolysis- kidney injury
- Device costs
- Experience
Mechanical thrombectomy versus thrombolysis

Systematic review and meta-analysis
17 studies 2001-2019
1417 patients
Heterogeneity!
- Devices
- Outcome measures

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<td>Successful lysis (&gt;50%)</td>
<td>95%</td>
<td>96%</td>
</tr>
<tr>
<td>Primary patency (6m)</td>
<td>94%</td>
<td>68%</td>
</tr>
<tr>
<td>PTS</td>
<td>Not possible</td>
<td>Not possible</td>
</tr>
<tr>
<td>Valvular reflux</td>
<td>53%</td>
<td>61%</td>
</tr>
<tr>
<td>Recurrent DVT</td>
<td>Not possible</td>
<td>Not possible</td>
</tr>
<tr>
<td>Major bleeding</td>
<td>1%</td>
<td>6%</td>
</tr>
<tr>
<td>Hematuria (hemolysis)</td>
<td>93%</td>
<td>2%</td>
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<td>PE</td>
<td>1%</td>
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Conclusion

• Mechanical/ pharmacomechanical thrombectomy safe
• Compared to CDT alone lower risk bleeding complications
• Ongoing device improvement
• Randomised studies
  • Efficacy thrombectomy vs anticoagulation/ thrombolysis
  • Compare different devices
  • Guide future strategies