Novel approach to percutaneous thrombolysis in large caliber clotted vascular access using ultrasound accelerated thrombolysis technology

Jessica A. Zagory MD, Paul E. Perkowski MD, London Guidry MD, Jon V. Schellack MD

Department of Surgery
Louisiana State University
Health Sciences Center
New Orleans LA
Disclosures

• The speaker and the authors have no financial relationships to disclose.
End stage renal disease (ESRD) incidence and cost continue to increase:

- 616,000 patients on hemodialysis (HD)
- 60% with arteriovenous fistula
- Thrombosis rate: 0.8 episodes per year
- Complications of HD access total $2.9 billion per year
Background

• Thrombosis Interventions
  – Catheter thrombectomy
  – Rheolytic thrombectomy
  – Catheter directed thrombolysis

• Risks
  – Incomplete thrombolysis
  – Propagation of pulmonary embolism
  – Bleeding
Background

USAT: Ultrasound Accelerated Thrombolysis

• Previous indications
  – Deep venous thromboembolism
  – Pulmonary embolus
  – Embolic stroke
  – Arterial occlusion

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Aims

• Application of USAT technology in large caliber clotted vascular access

• Determination of USAT safety in ESRD patients

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Methods

• Prospective Trial
• July 1, 2013-October 31, 2013
• Consecutive patient enrollment
Enrollment Criteria

- Thrombosis of dialysis vascular access extending to large and/or central veins
- Included both fistulas and grafts
- Excluded if thrombolysis contraindicated
## Results - Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>6</td>
</tr>
<tr>
<td>Age (mean)</td>
<td>43.8</td>
</tr>
<tr>
<td>Sex (male)</td>
<td>2</td>
</tr>
<tr>
<td>Native vein</td>
<td>5</td>
</tr>
<tr>
<td>Graft</td>
<td>1</td>
</tr>
<tr>
<td>Days to thrombosis (mean, range)</td>
<td>475 (25-1762)</td>
</tr>
</tbody>
</table>
# Results

<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Hours from thrombosis to USAT:</td>
<td></td>
<td>4-24</td>
</tr>
<tr>
<td>range (mean)</td>
<td></td>
<td>(9.2)</td>
</tr>
<tr>
<td>Hours of infusion:</td>
<td></td>
<td>8-20</td>
</tr>
<tr>
<td>range (mean)</td>
<td></td>
<td>(16.5)</td>
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<tr>
<td>Resolution after USAT</td>
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<td>83%</td>
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<tr>
<td>Adjunct therapy</td>
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<tr>
<td>Complications</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>
Patient #1
Initial Fistulogram
Post-USAT Fistulogram
Post-USAT Fistulogram
Post-USAT Fistulogram
PTA of Stenosis
Final Fistulogram
Patient #2
Initial Fistulogram
Fistulogram - USAT
Post-USAT Fistulogram
Post-USAT Fistulogram
PTA of Stenosis
PTA of Stenosis
Completion Fistulogram
Conclusions

• USAT can be safely and effectively applied to large caliber thrombosis in dialysis access

• Can be used to maintain patency in both fistulas and grafts
References


