Advances In The Endovascular Treatment Of ALI: Equipment, Techniques And Results

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Endovascular Treatment of ALI

- Thrombolysis
  - Catheter Directed
  - Ultrasound Assisted (e.g. EKOS)

- Manual Thromboaspiration
  - e.g. Pat-Rat catheter

- Mechanical Thrombectomy
  - e.g. Penumbra Indigo, Angiojet, Rotarex

Manual Thromboaspiration

- Equipment
  - 8F Sheath
    - Removable Valve
  - 8F Aspiration catheter
    - 1 end-hole
  - 6F Aspiration catheter
    - Smooth tip (crural)
  - 50cc Syringe

- Technique
  - Aspiration catheter just above the proximal end of the thrombus
  - Do not cross the thrombus
    - Avoid distal embolisation

Disclosures

- None
Technique

- Continuous aspiration
  - 50cc Syringe
- Catheter withdrawal
- Clot removal

Technique

- Valve disconnection for large thrombus removal

Technique

- Repeat sequence until no more thrombi can be aspirated
- Adjunct PTA/stenting if residual stenosis or remaining clots

Nuremberg Experience

- 2009-2017
  - N = 405
    - Grade I (Viable) 309 (76.3%)
    - Grade II (Threatened) 96 (23.7%)

Early Outcome

- Technical success 370 (91.4%)
  - Additional PTA 127 (31.4%)
  - Additional PTA & Stenting 134 (33.1%)
  - Additional open surgery
    - Embolectomy 19 (5.1%)
    - Bypass 10 (2.5%)
- 30-d Mortality 14 (3.5%)
- 30-d Major amputation 5 (1.2%)

Complications

- Access site Hematoma 21 (5.2%)
  - Surgical revision 8 (2%)
Follow-up
Mean 25.8 ± 17 months

- New onset of symptoms 89 (22%)
- Reintervention 64 (15.8%)
- Major amputation 10 (2.5%)
  - AKA 5
  - BKA 5
- Related death 4 (1%)

Case Example (1)
- 76 YO Female Pt
- ALI 6 h ago
  - Grade I
- Atrial fibrillation
  DSA →

Case Example (2)
- 69 YO Male
- ALI 10 days ago
  - Grade I
- Atrial Fibrillation

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Mechanical Thrombectomy

**INDIGO Penumbra**
- Catheter & separator
- Aspiration pump

*30 pts, Thrombectomy with INDIGO Penumbra*
- Technical Success: 72.7%
  - Above the knee: 53.9%
  - Below the knee: 85.0%, p=0.05
- Additional Stenting: 18.2%
  - Above the knee: 38.5%
  - Below the knee: 5.0%, p=0.015*

→ Safe & effective, further investigation needed...

**Mechanical Thrombectomy**

**Angiojet**
- Catheter
  - e.g. Solent Proxi & Dista
- Control Console + Pump

*283 pts, Thrombectomy with Angiojet*
- Technical Success: 83%
- Additional Thrombolysis: 48%
- Freedom from amputation at 1 year: 96%

→ Angiojet ± Thrombolysis: ↑ Limb salvage rates

**Percutaneous Mechanical Thrombectomy Using Rotarex® S Device in Acute Limb Ischemia in Intrainguinal Occlusions**
- 147 pts, Thrombectomy with Rotarex S
  - 30d mortality: 0.7%
  - Technical success
    - Rotarex only: 68.7%
    - Rotarex + thrombolysis: 90.5%

→ Rotarex + selective thrombolysis: safe alternative

**Conclusions**

- Endovascular treatment of ALI
  - Manual thromboaspiration
    - Simple equipment
  - Mechanical thrombectomy
    - Several devices available (more complex?)
      - Higher costs, limited availability

→ Complimentary PTA/Stenting & Thrombolysis frequently useful