Technical Aspects for Venous Interventions In the Acute Setting

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Disclosure

Speaker name:

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I have the following potential conflicts of interest to report:

- Consulting: J&J; Bard; Optimed
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest
Access

- Ultrasound
  - Avoid inadvertent arterial puncture
- Ipsilateral popliteal vein, 8-10F
  - Parallel catheter introduction
- Isolated iliac vein: groin/upper leg access
- Consider contralateral access (profunda vein)
  - Optimize inflow
Endovascular therapy

- Pharmaco – Mechanical
  - Trellis
  - Ekos (Internal ultrasound)
Endovascular therapy

- Pharmaco – Mechanical
  - Trellis
  - Ekos (Internal ultrasound)

BERNUTIFUL STUDY

Ultrasound-Assisted Versus Conventional Catheter-Directed Thrombolysis for Acute Iliofemoral Deep Vein Thrombosis

Rolf P. Engelberger, MD; David Spirk, MD; Torsten Willenberg, MD; Adriano Alatri, MD; Dai-Do Do, MD; Iris Baumgartner, MD; Nils Kucher, MD
Endovascular therapy

- Pharmaco – Mechanical
  - Trellis
  - Ekos (Internal ultrasound)

- Mechanical
  - Angiojet
  - Aspirex
Remove residual thrombus

Postthrombotic morbidity correlates with residual thrombus following catheter-directed thrombolysis for iliofemoral deep vein thrombosis

Anthony J. Comerota, MD,\textsuperscript{a} Nina Grewal, MD,\textsuperscript{a} Jorge Trabal Martinez, MD,\textsuperscript{a} John Tahao Chen, PhD,\textsuperscript{b} Robert DiSalle, MD,\textsuperscript{a} Linda Andrews, RN,\textsuperscript{a} Deb Sepanski, RT(R),\textsuperscript{a} and Zakaria Assi, MD,\textsuperscript{a} Toledo and Bowling Green, Ohio

\textit{Background:} Iliofemoral deep vein thrombosis (DVT) is associated with severe postthrombotic morbidity when treated with anticoagulation alone. Catheter-directed thrombolysis (CDT), with or without the addition of mechanical techniques, is increasingly recommended for patients with iliofemoral DVT, although its effect on postthrombotic syndrome is not established. This study examined the correlation of residual thrombus with postthrombotic syndrome after catheter-based attempts at thrombus removal in patients with iliofemoral DVT.

- Residual thrombosis correlates to complaints
- 83\% of pts with <10\% thrombosis -> no PTS
- Lineair correlation % thrombus lysis and clinical score
Remove residual thrombus

Quantity of Residual Thrombus after Successful Catheter-directed Thrombolysis for Iliofemoral Deep Venous Thrombosis Correlates with Recurrence

F. Aziz\textsuperscript{a}, A.J. Comerota\textsuperscript{a,b,*}

- Residual thrombosis correlates to recurrent DVT
- >50% residual thrombosis: 38% recurrent DVT
- <50% residual thrombosis: 5% recurrent DVT
Removing clot in real life

• Thrombectomy devices work brilliantly in models
  • Silicone tubes
  • Different consistency (sludge)

• Residual clot in thrombosed veins
  • Advanced thrombus organization
  • Thrombus attachment to vein wall
  • Thrombus age is critical
Imaging DVT

- Duplex US
- CT-flebografie
- MR-Flebografie
Thrombus age on MR venography

Arnoldussen et al, Phlebology 2014
How to remove more?

- Interventional techniques
  - Curved guiding sheaths
  - Macerate clot
    - Specific devices or balloon dilation

- Do not stent too early

- Make use of natural filters
  - May-Thurner and other obstructions
Causes of obstruction

• Outside compression
  • May-Thurner syndrome: overriding common iliac artery
  • Arterial aneurysm
  • Osseous: spondylophyt

• Intraluminal pre-existent disease
  • Post-thrombotic
  • Webs and spurs (long-term compression; radiation therapy)

• Congenital
  • Vena cava atresia
% of underlying obstruction

• Literature: underlying cause of DVT estimated at 50%

• Maastricht experience
  • 77% received additional stenting for underlying compression
  • Initial under-diagnosis of obstruction

• Bern experience (Bernutiful trial)
  • 80% received additional stenting for underlying obstruction
  • Not all patients were imaged with IVUS
DVT due to CIV compression (MTS)
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DVT due to IVC obstruction
DVT due to IVC obstruction
DVT due to IVC obstruction
DVT due to IVC obstruction
Alternative route for thrombolysis
Profunda vein thrombolysis
Profunda vein thrombolysis
Profunda vein thrombolysis
Conclusions

• Get as much thrombus out as you can
  • With limited damage to wall and valves

• Treat for optimal inflow AND outflow
  • Profunda vein might be best

• High number of underlying obstructions
  • First use it and then lose it!
European Venous Centre; Aachen-Maastricht

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