Interventional Techniques for Central Vein Stenosis in the Chest

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Disclosures:

In the past 12 months, my spouse or myself have engaged in financial relationships as follows:

- **Consultant:**
  - Boston Scientific, Medtronic, CSI

- **Speakers Bureau:**
  - Medtronic, Abbott, Endologix

- **Research Support**
  - Philips Healthcare, Venite, Bard, BTG, Boston Scientific, Penumbra, Angiodynamics, Medtronic

- **Clinical Events Committee**
  - Shockwave (Disrupt PAD), Intact Vascular (TOBA-2)
Complex Central Vein Reconstruction
The procedure/setup up

• Supine
• Both upper extremities abducted 90 degrees
• +/- groin access
The tool box

- **Access:** Micropuncture kit, 25-40+ cm 7Fr or 8 Fr vascular sheaths

- **Procedural Guidewires:** Hydrophilic wires and 260cm stiff wires

- **Catheters:** Angled (Kumpe, Vertebral or Bernstein), measuring catheters, guide catheters, long sheaths, 6 Fr Goose Neck snare, Re-entry or recanalization catheters

- **Thrombolysis / Thrombectomy devices** (determine amount of fresh clot to decide thrombectomy / lysis vs. rapid stenting)

- **Sharp recanalization:** 65cm 21 gauge Chiba needle (DCHN-21-65.5-U), 9 or 10 Fr Rösch-Uchida introducer sheath, Nitrex .018 guidewire, Gooseneck snare, (coaxial system) microcatheter in a 4fr Glide catheter or slip catheter.

- **Balloons:** 8-14mm diameter 2 or 4cm length

- **Stents:** 8-14mm diameter (Nitinol self expanding and/or covered)
SVC syndrome secondary to HD catheters
Sharp recanalization of chronically occluded Right Brachiocephalic Vein
TECHNICAL NOTE

Sharp Central Venous Recanalization in Hemodialysis Patients: A Single-Institution Experience

Mohammad Arabi¹ · Ishtiaq Ahmed¹ · Abdulaziz Mat’hami¹ · Dildar Ahmed² · Naveed Aslam²

100% technical success
28% major complications

CLINICAL INVESTIGATION

Success Rate and Complications of Sharp Recanalization for Treatment of Central Venous Occlusions

Emil I. Cohen¹ · Christopher Beck¹ · Jesse Garcia² · Ryan Muller² · Hyun J. Bang² · Keith M. Horton² · Farris Hakki²

95% technical success
5% major complications
Sharp Recanalization - Outback
Sharp recanalization - Advanced
After wire was externalized a microcatheter was advanced from the groin and then the wire was pulled into the left subclavian vein.
Sharp recanalization

- Good pre-op imaging paramount to know what you are going to possibly hit/cross
- Use a target on the other end
- Don’t use big needles
- Maybe helpful to use covered stents
Caudal-cranial direction:
(+): Lower risk of cardiac tamponade
(-): Unstable: heart beats

Cranio-caudal direction:
(+): Stable access
(+): Larger target area
(-): > risk of cardiac tamponade
Radiofrequency wire technology

- **Generator:**
  RF energy = vaporizes channel through occlusion but minimal damage to surrounding tissues

- **Grounding Pad**

- **Activated by a pedal or pushing the yellow button**
Central venogram:
- Collaterals
- Length of the occlusion
- Diameter of the venous stumps
In summary

- With compulsive pre-procedure planning and meticulous technique, most central vein occlusions can be crossed and stented.
- Be careful and avoid sharp needle crossing without navigation/guidance.
- Great deal of potential research regarding ideal stent and post-revasc protocol to maintain vessel patency and improve outcomes.