Use of Right Atrial Bypasses for Permanent AV Access in ESRD Patients with Central Venous Occlusions: Indications, Technical Tips, and Precautions

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No disclosures

Central Venous Anatomy

Central Venogram

- Described technique in 9 patients
- 30-day outcomes
  - 8 of the 9 patients had significant resolution of symptoms
  - No deaths
- Long-term outcomes (1.5 to 53 month follow-up)
  - 6 patients patent bypasses with continued relief of symptoms
  - 1 recurrent edema at 38 months
  - 2 patients AV access removal for infection at 4.5 and 6 months
  - 7 deaths

Subclavian Vein-to-Right Atrial Bypass for Symptomatic Venous Hypertension

- Right atrial bypass grafting for central venous obstruction associated with dialysis access: Another treatment option

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What happened?

1. Medically unfit for large open surgery
2. Endovascular techniques
3. Hemodialysis Reliable Outflow (HeRO) graft (Merit Medical, South Jordan, Utah)
4. Lower extremity arteriovenous (AV) access
5. Catheter dependence
6. Peritoneal dialysis
7. Kidney transplant

Endovascular Techniques

- 47 patients with 49 central stenosis treated with primary angioplasty (PTA)
- 26 patients with 26 central stenosis treated with primary stenting (PTS)
- Outcomes (Primary Patency)
  - 30-day 76% both groups
  - 12-month 29% PTA vs. 21% PTS (p=.48)
- Outcomes (Primary Assisted Patency)
  - 30-day 71% both groups
  - 12-month 73% PTA vs. 68% PTS (p=.08)
- Procedures
  - PTA 66 interventions/stenosis (avg 2.0)
  - PTS 54 interventions/stenosis (avg 2.7)

Hemodialysis Reliable Outflow (HeRO)

- 60 HeRO graft placements
- 22 lower extremity AV access placements
- Outcomes (HeRO graft-6 months)
  - 77% secondary patency
- Outcomes (lower extremity AV access-6 months)
  - 85% secondary patency
- Comparison
  - Number of interventions to maintain patency significantly higher in HeRO graft (2.23 vs. 1.7 per year, p < 0.001)
  - Similar infection rates (0.61 vs. 0.71/1000 days)
  - Similar mortality rates (22% vs. 19%)

Lower extremity arteriovenous (AV) access

- Right atrial bypass should still be considered as an option!
**Technical tips**

- **Inflow**
  - Need appropriate imaging, usually venogram, pre-surgery to assure appropriate site selected
  - Dilate/unroof arterial site, proceed with subclavicular incision
  - End-to-side anastomosis between inferior vein and conduit

- **Conduit**
  - 10-16 mm external reinforced PTFE graft

- **Tunnel**
  - Made bluntly through the second intercostal space

- **Outflow**
  - Median sternotomy
  - End-to-end anastomosis between conduit and right atrial appendage

- **Arteriovenous (AV) Access**
  - Important to keep venous bypass open
  - If cannot salvage, need to perform a new AV access at time of bypass

**Precautions**

- **Best precaution is prevention**
  - Avoid central venous catheters
  - Autogenous AV access is at all possible for longest patency rates
  - Avoid central venous stents if at all possible
  - Early transplant referrals and patient/family education

- **If unable to prevent**
  - Patient selection is critical
  - Fit to undergo a large surgery
  - Avoid central venous stents if at all possible
  - Autogenous AV access is at all possible for longest patency rates
  - Not good candidates for lower extremity (PVD) or peritoneal (history of abdominal surgeries/peritonitis) dialysis
  - Are not candidates or do not have donor available for kidney transplant

**Surgical Options – Subclavian Occlusions**

- Internal Jugular to Axillary Vein Turndown
- Axillary Vein to Internal Jugular Bypass