Counterpoint
Place a Tapered Graft in Patient with History of PVD or Steal

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Questions
• Can we predict or prevent steal syndrome?
• How do we evaluate patients with significant PVD who require vascular access?
• Are tapered AV grafts useful in preventing steal?
• Is proximalization of arterial inflow a better strategy to treat or prevent steal syndrome?

Steal syndrome complicating hemodialysis access procedures: Can it be predicted?

• Digital / Brachial Index < 0.6 predicts patients at risk for severe steal
• All patients with severe steal had DBI < 0.6
  – Average 0.44 (Range 0.24 – 0.58)
• Sensitivity 100% Specificity 59%
• Pos Predict Value 18% Neg Predict Value 100%
• No access revision at initial operation if DBI < 0.6
• If revising access 2nd to steal, must raise DBI to > 0.6

Do preoperative finger pressures predict early arterial steal in hemodialysis access patients? A prospective analysis.
Valentine, et al., JVS 36:351,2002

• 72 brachial artery based access procedures studied prospectively - 12 AVF, 60 PTFE (10 taper)
• 9 (64%) of patients with steal had DBI < 1.0
• 18 (31%) of patients without steal had DBI < 1.0
• Preop FP lower (131 vs 151) (p<0.3) in patients with steal
• No absolute FP or DBI below which steal was inevitable

Relationship of hemodialysis access to finger gangrene in patients with ESRD
Yeager, et al, JVS 2002

• 23 patients with finger gangrene with ipsilateral AVF
• Young diabetic patients with diffuse atherosclerosis
• Bilateral gangrene in 61% of patients
• Finger gangrene result of distal atherosclerosis and not primarily related to dialysis access

Strategies to Prevent Arterial Steal Following Hemodialysis Access in Patients with History of PVD or Steal

• Preoperative testing to identify proximal arterial lesions (duplex, angiogram)
• Stepped or tapered grafts to limit flow
• Proximalization of arterial inflow
Proximal arterial lesion

- Uncommon but important cause of distal ischemia after hemodialysis access
- Subclavian lesions more common on left
- Most patient right hand dominant with left sided access

Do tapered grafts reduce the incidence of arterial steal?

Yes: Krueger U: Effect of tapered grafts on hemodynamics and flow rate in dialysis access grafts
- Experimental study demonstrating up to 28% flow reduction at identical pressures with graft taper to 4 mm

Yes: Hines: 4-7 mm tapered PTFE grafts: Techniques of construction and preservation of graft life
- 278 grafts - reduced inflow with tapered grafts reduces risk of steal syndrome

Do tapered grafts reduce the incidence of arterial steal?

Yes: Sabanayagam P: 15 year experience with tapered and straight PTFE angioaccess in the ESRD patient
- 1256 grafts, no patency difference, significant reduction in the incidence of steal syndrome

Maybe: Hiranaka, T: Prospective, randomized trial of tapered and straight grafts for hemodialysis access
- 60 grafts (2/20 straight 6mm., 0/40 tapered 4-6mm.)

Do tapered grafts reduce the incidence of arterial steal?

No: Schaffer, D: Prospective randomized trial of 6 mm v 4-7 mm PTFE grafts for hemodialysis access in diabetic patients
- 59 patients – no difference ischemic complications but significant increase in thrombosis risk for tapered grafts

No: Dammers, R: Evaluation of 4-7 mm. v 6 mm. brachial-antecubital grafts for hemodialysis
- 109 grafts - no significant difference in graft flow rates or patency

Additional strategies to minimize risk of dialysis access steal syndrome

- Radiocephalic fistula when feasible
- Proximal radial artery inflow when feasible
- Minimize use of brachial artery inflow
- When brachial inflow necessary, limit size of anastomosis
- Axillary artery inflow in high risk patients
• 5 patients with debilitating ischemia after forearm fistula construction requiring ligation

• Proximal bridge fistula with arterial inflow from axillary artery branch without recurrent ischemia

• Centrally localized arteriovenous anastomosis and reduction of fistula flow significantly increase distal arterial pressure and perfusion.

Proximalization of the arterial inflow: A new technique to treat access-related ischemia
J Zanow, U Kruger, H Scholz

• Effective in treating access related ischemia

• Does not sacrifice natural arterial continuity

• Alternative to DRIL

Primary arteriovenous fistula inflow proximalization for patients at high risk for dialysis access-associated ischemic steal syndrome
William C. Jennings, MD, Scott E. Brown, MD, and Carmen E. Rosi, MD
J Vasc Surg 2011

Clinical Outcomes (37 patients)
Access strategies in patients with history of PVD or steal

- Equal numbers of 4-7 mm tapered and 6 mm straight (WL Gore) placed despite lack of objective evidence that taper reduces steal
- Use of tapered grafts may treat surgeon more than patient
- Proximalization may be more effective strategy to deal with potential or real ischemic complications
- Proximalization feasible with AV fistulas (Jennings) or grafts