Vascular Access in the Lower Limb: PTFE Grafts

Abords vasculaires aux membres inférieurs. Le pontage PTFE

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I have **no financial relationships** to disclose.

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je n’ai **aucune relation financière** à déclarer.
Why access in the leg?

Upper limb access preferred but not always possible
Disadvantages of leg AV access

- Increased infection
- Higher incidence of vascular disease
- Previous DVT
- Greater risk of steal
- Less acceptable for patients
Why access in the leg?

- Central venous occlusion or stenosis
Why access in the leg?

- No upper limb access sites remaining
Options

• Autogenous
  – LSV
  – Femoral vein

• Prosthetic
Prosthetic or Autogenous?

- Long saphenous vein not always available and has poor patency
- Femoral vein usually available but has very high flow and greater risk of steal
Prosthetic or Autogenous?

**Against Prosthetic**
- Greater infection risk (18.4% vs 1.6%)
- Increased incidence of stenosis and thrombosis (1yr 1st patency 48% vs 83%; 2nd patency 69% vs 93%)
- More revisions required

**Pro Prosthetic**
- Early Cannulation
- Lower risk of steal (7% vs 21%)

• No suitable leg veins (e.g. previous femoral DVT, LSV small or previously removed)

• Early cannulation is needed because of poor CVC access

• When there is a high risk of steal
  — Diabetics
  — Peripheral vascular disease
Which prosthetic graft?

• PTFE
  – Conventional  e.g. Impra, Goretex
  – Slider  graft  e.g. Atrium
  – Stepped, or tapered grafts
  – Distal expansion  e.g. Venoflo
  – Externally or internally supported  
    e.g. Centerflex, Interring
• PTFE
  – Gelatin impregnated (allowing rifampicin bonding) e.g. Vascutek

  – Heparin bonded e.g. Propaten

  – Self-sealing grafts for early cannulation
    e.g. Flixene, Acuseal
Which prosthetic graft?

- Polyurethane grafts  Vectra

- Biological grafts
  - Bovine mesenteric vein  Procol
  - Bovine carotid artery  Artergraft
  - Bovine ureter  Synergraft
Upper thigh loops

- From the femoral triangle
  - CFA- CFV
  - SFA – SFV/CFV
  - Using branch of CFA (e.g. profunda or lateral circumflex)
Graft Configurations

Mid-thigh loops

- SFA-SFV (allows femoral CVC and more proximal access, but complication similar to upper thigh loops)
Graft Configurations

Straight grafts

• Popliteal artery – CFV/SFV
  – ? Higher incidence of steal

• SFA-popliteal vein
Graft Configurations

- Ext iliac artery – external iliac vein
- Fem-fem crossover AV graft
- Exotic grafts
  - Axillo- femoral
  - Axillo –iliac
  - Axillo-popliteal
Graft Configurations

- Fem-fem arterio-arterial
Complications

• Stenosis
  – PTA
  – Stents
    – Covered stents
  – Surgical revision
• Thrombosis
  – Thrombolysis + PTA/covered stent
  – Thromboaspiration
  – Combined chemical and mechanical thrombectomy
  – Surgical thrombectomy + revision
Complications

• Infection
  – Localised
    • Antibiotics
    • Vacuum dressing
    • Localised bypass + excision
  – Complete
    • Total graft excision
    • Subtotal graft excision
Complications

- Steal
  - Graft ligation
  - Banding
  - DRIL
  - Proximalisation of Arterial Insertion (PAI)
  - Amputation below AVG
• **Venous Hypertension**
  
  – Relatively uncommon
  
  – Usually caused by proximal venous thrombosis or stenosis
  
  – Thrombolysis + stent
Conclusions

• AV leg grafts occasionally necessary
• Allow early cannulation
• Less steal but more infection than femoral vein grafts
• Prosthetic graft preferred for PVD, diabetics and when central access difficult
Conclusions

- Mid thigh loop is probably best configuration
- Complications treated as in upper limb
- PAI possibly best to treat steal