Strategies for Management of Prosthetic Dialysis Graft Infections

Mitchell L Henry
The Ohio State University Wexner Medical Center

No Disclosures Given

Inflammation in ESRD patients
- Dialysate quality, membrane compatibility, access issues
- Increased oxidative stress
- Retention of solutes
- Proinflammatory comorbidities: DM, obesity, atherosclerosis, insulin resistance
- Increased proinflammatory cytokines with decreased clearance
- Malnutrition, anemia, of chronic disease

Graft Infections
CVC - High infection rates:
- 2.5-5.5 cases / 100 patient days
- .9-2.0 episodes / patient-year
- The question is not if, but when, bacteremia will occur
- Underlying immune dysfunction
- Hematogenous spread – can lead to graft infection, endocarditis, osteomyelitis, septic pulmonary emboli, meningitis

Graft Infections
Additional risks:
- Age
- Diabetes
- Obesity
- ANCA + ESRD diseases
- Lower extremity grafts

Graft Infections
Incidence – 8-35%
Approximately 80% are gram (+)

Types of Prosthetics:
- In general, most studies have not shown differences between prosthetic grafts
- Recent studies have not shown differences in “immediate stick” grafts
- One study described significant increase in infection with early accessed polyurethane grafts (not in multicenter trial)
Complications of infected graft

- Thrombosis
- Progressive tunnel infection
- Progressive skin infection/necrosis
- Pseudoaneurysm formation (mycotic)
- Systemic issues, i.e. endocarditis
- Massive hemorrhage

Associated Considerations

Evaluate for infection pre-placement
Details in OR
- Appropriate preparation
- Prophylactic antibiotics
- Keep graft off of skin
- Meticulous hemostasis

Associated Considerations

Dialysis details
- Attention to skin preparation
- Needle rotation
- Avoid infiltration!
- Aggressive CVC discontinuation

Surgical Management

- Early infections often associated with wound hematoma
- Puncture infiltrations particularly problematic
- 63% of infections could be associate with a puncture site or an infected central venous catheter

Graft Infections

Immediate - erythema
- arm swelling

Early - superficial cellulitis

Later - localized
- generalized

Surgical Management

Most important decision:

Is this a local infection or is the entire graft infected?
Surgical Management

Surgical options:
- Partial graft excision (PGE)
- Subtotal graft excision (SGE)
- Total graft excision (TGE)

Local – exposed graft vs surrounding infections
- Simply exposed graft, minimal debridement +
  1) mobilizing wound edges and closure
  2) V-Y advancement skin flap
  3) negative pressure dressing

Local infection – local resection and bypass in uninfected plane (PGE)

“More than local” – frequently don’t know extent of infection until the operative field is exposed

Key – lack of incorporation of graft
- Sub-total resection (SGE) – remove graft which is determined to be involved to outflow
- Leave small cuff of graft on artery - patch artery if anastomosis is concerning (TGE) - brachial artery ligation is another option

My biases:
- Use betadine in wound
- Rarely need to do TGE and artery repair
- Iodine soaked packs in tunnel, remove in 24 hours

Conclusion
- Graft infection management requires a balance to achieve eradication of infection and continued means to provide hemodialysis
- Careful decision making can achieve successful management primarily with PGE and SGE with minimal morbidity and allow salvage of access sites

Other Options
- Depending on patient’s dialysis options
  - create secondary AV fistula
  - Immediate use of Cryopreserved vein