Dialysis Access
Everyday Questions and Evidence for Them

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What we want to cover - Objectives

Dialysis access

Problems we see in dialysis unit or with home patients

Usual causes of those problems

What does research and experience suggest for solutions
Disclosures

- I have nothing to disclose
Catheters - Challenges

Poor flows and Positional flows

Infection

Bleeding

Broken clamps

Pain
Catheter issues - causes

Show pictures of catheter, out of body, in the body. Mark different parts.

Kinked catheter, short catheter, long catheter, fibrin sheath.

Infection location - Bloodstream infection v/s exit site infection. Treatment strategy.
IR Evaluation of HD Catheter

- Catheter imaging w/ contrast can identify and treat various issues
  - Residual lumen thrombus -> pharmacologic or mechanical thrombolysis
  - Malpositioned catheter tip -> reposition or exchange
  - Fibrin sheath at tip -> angioplasty/exchange/stripping
  - SVC thrombosis/stenosis -> thrombolysis/angioplasty/stent
Tunneled Cuffed HD Catheter
Catheters are benign?

Clinical abnormality

> 50% stenosis
Cuffed Catheters
Intraluminal Thrombus
Subclavian Occlusion
Fibrin Sheath
Hero Anatomy
Catheter Infections

Treatment

- Catheter exit-site, no tunnel infection
  - Treat w/ topical and/or oral Abx, not necessary to remove catheter
  - If bacteremic pt is afebrile w/in 48 hrs and stable, catheter salvage might be considered w/ interdialytic Abx lock solution and 3wks of parenteral Abx, f/u Blood Cx in 1 wk
- Abx lock when f/u cultures indicate reinfection w/ same organism in pt w/ limited access
- Short-term catheters should be removed when infected
Stenoses should be treated if:

Clinical or physiologic abnormality + Anatomic abnormality

- decreased access blood flow (<600ml/min, decrease in flow)
- elevated venous pressure
- decreased dialysis dose (Kt/V)
- abnormal physical exam

KDOQI Guideline 4
Treatment of Stenoses
Access Evaluation for Ischemia

- Stage I, pale/blue and/or cold hand without pain
- Stage II, pain during exercise and/or HD
- Stage III, pain at rest
- Stage IV, ulcers/necrosis/gangrene
Fistula and Grafts - Relating to anatomy

Pictures of fistula and graft

On the picture show the lesion and explain how it can cause a problem

Include - venous stenosis, art stenosis, central stenosis, depth

If possible find angiogram for some of these lesions.

Cannulating a loop graft.

Aneurysms and importance of finding more sites to cannulate
Fistula and Grafts - Common issues

Difficulty cannulation
Prolonged bleeding
Pulling clots
Clotted access
High pressures/low flows
Aneurysms
Access Maturation Definition

• Rule of 6’s (Anatomic)
  – 6 mm diameter
  – 600 ml/min flow
  – 6 cm accessible
  – < 6mm depth

• 6 consecutive uses of new dialysis
Discussion Topics

- Barriers to timely access
- When do we cannulate
- When do we abandon a fistula
- How do we monitor the fistula? exam, flows, angio, nihilism
- Alternative sites in the challenging pt
**PTFE** Graft

- usually placed in the nondominant forearm
- requires 3 - 4 weeks for maturation

* Polytetrafluoroethylene
Humacyte: Autologous vein in a bottle
SFA-SFV Grafts

- Comparable patency.
- 21% infection rate.
- Avoids some of the pannus and lymphatics.
- Preserves more proximal access.
- Complications are easier to manage.
ESRD stages of Management

- Cannulation technique: button hole/rope ladder
- Removal of catheter
- Monitoring of access
- Thrombosis of access - 2/month
- Maintenance intervention of access
Nonmaturation vs Unusable

- 6 mm
- 600ml/mm
- 6 mm surface
- At least 6 mm in length
Multiplicity of Lesions

stenoses

stenoses

Diffuse severe stenoses
Angioplasty Procedure

Diagnostic fistulogram

position angioplasty balloon across stenosis

fully inflate balloon

access

vascular sheath

Post-PTA
Selecting the Appropriate Angioplasty Balloon

In general, high pressure balloons are used for angioplasty of neointimal hyperplastic stenoses

Primary selection criteria:
- Length
- Diameter
Endovascular Stents
Questions?

- Thank you for your time!