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

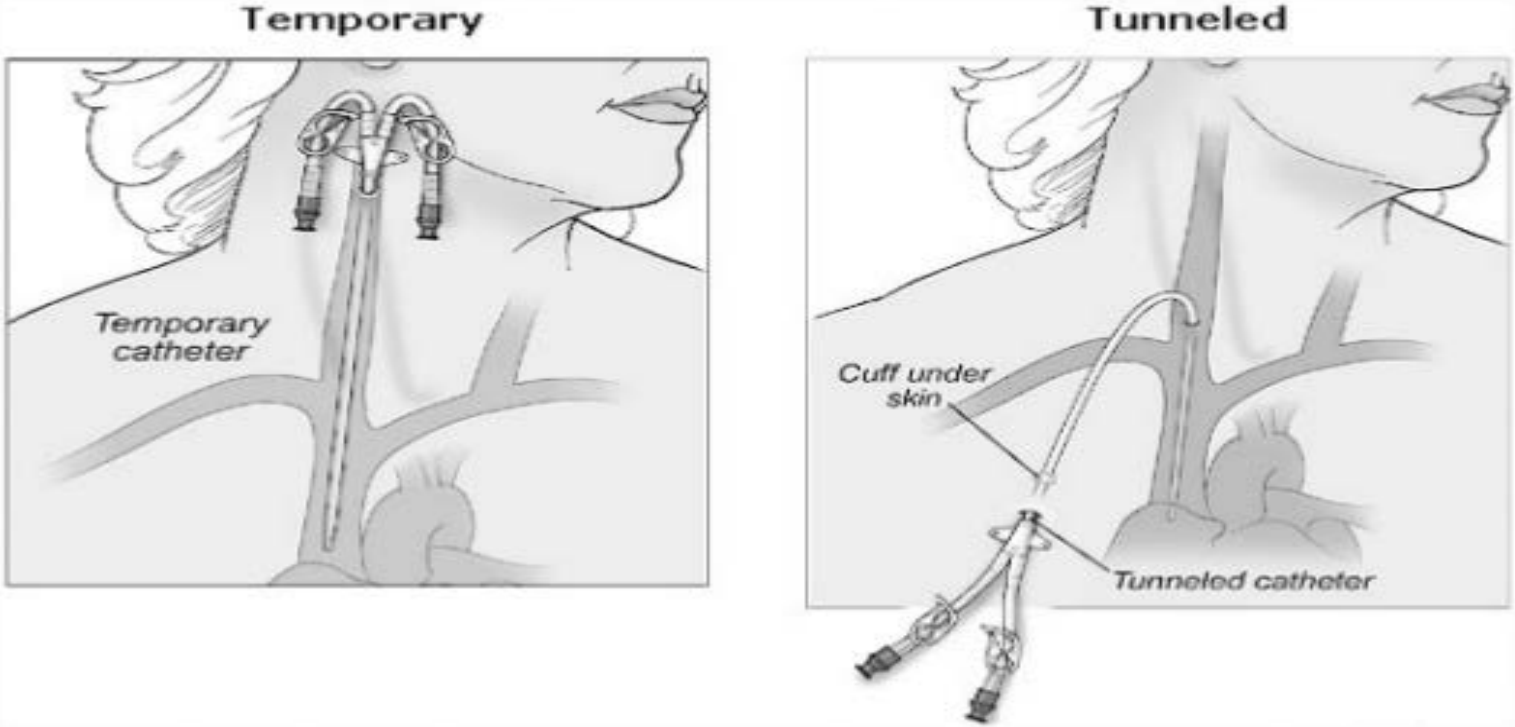
Show pictures of catheter, out of body, in the body. Mark different parts.

kinked catheter, short catheter, long catheter, fibrin sheath.

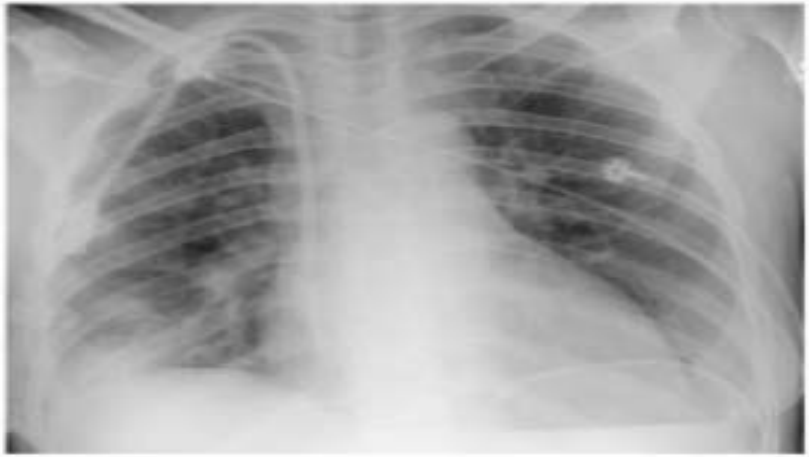
Infection location- Bloodstream infection v/s exit site infection. Treatment strategy.

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

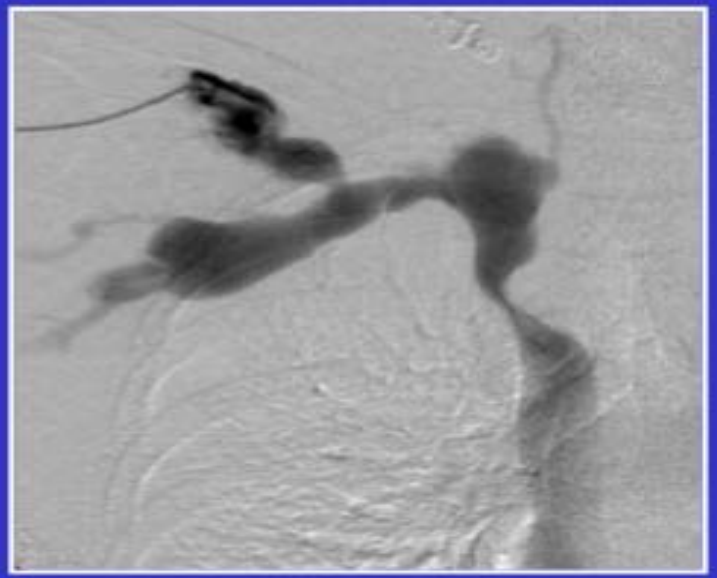

Temporary
Temporary catheter
Tunneled
Cuff under skin
Tunneled catheter

Tunneled Cuffed HD Catheter



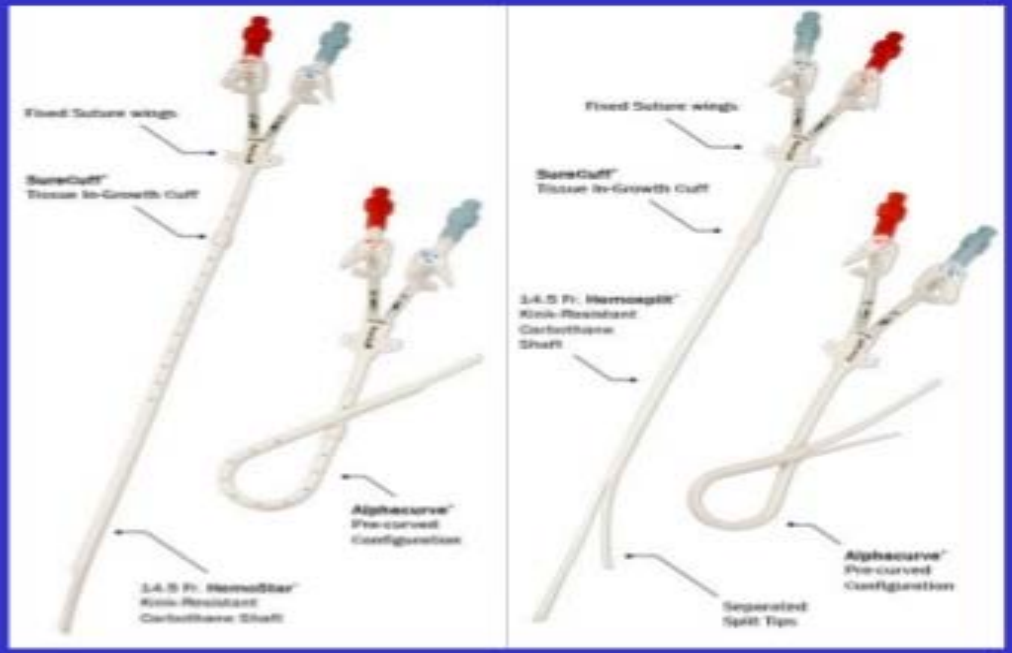
Catheters are benign?

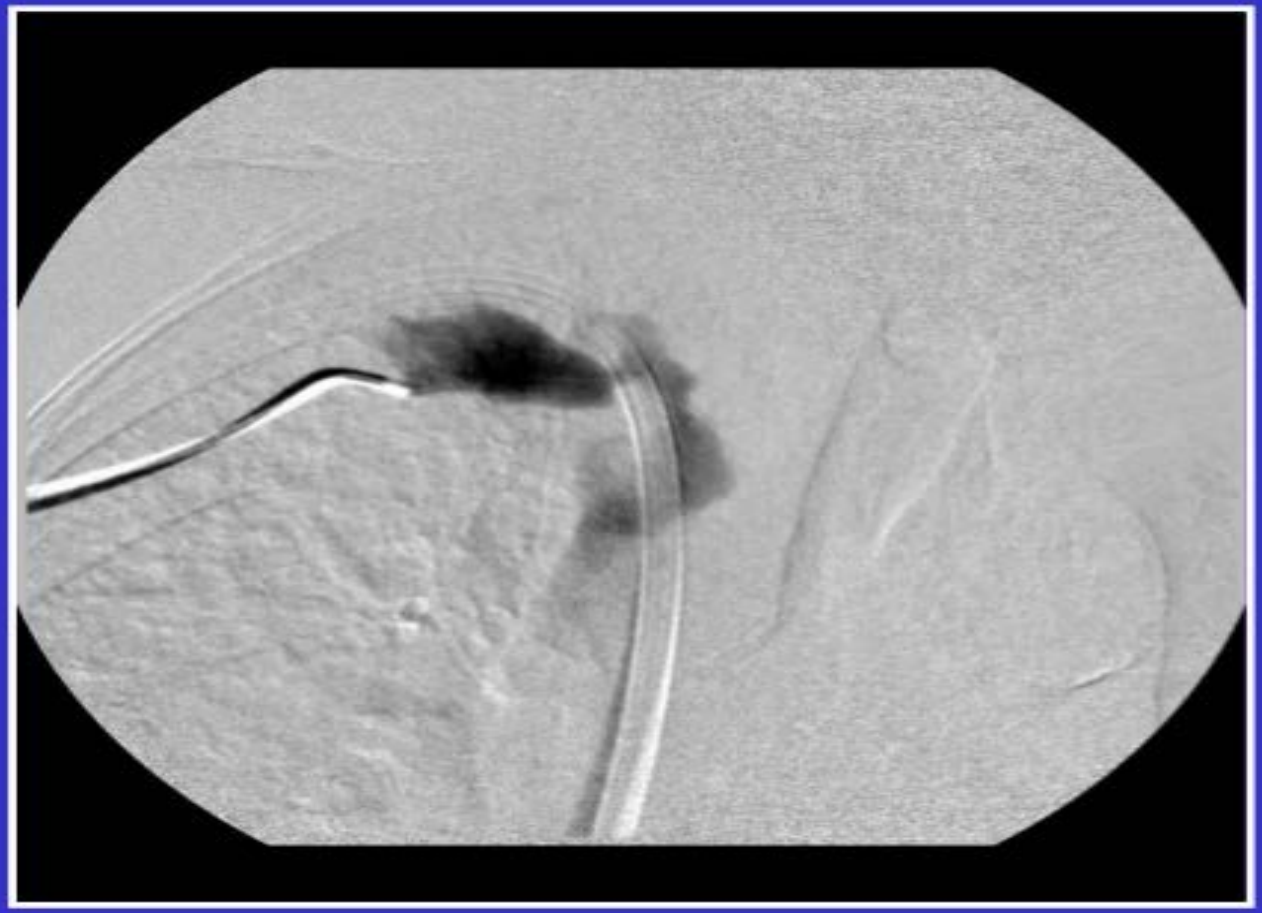
Clinical abnormality



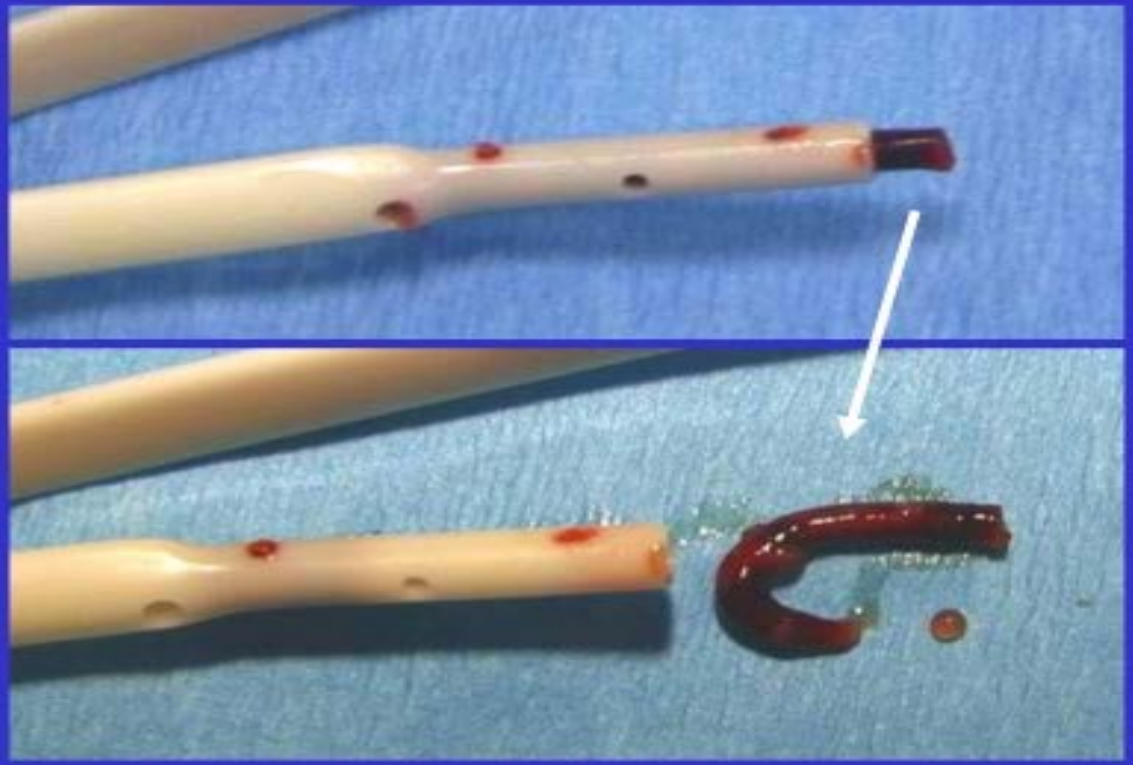
> 50% stenosis

Cuffed Catheters

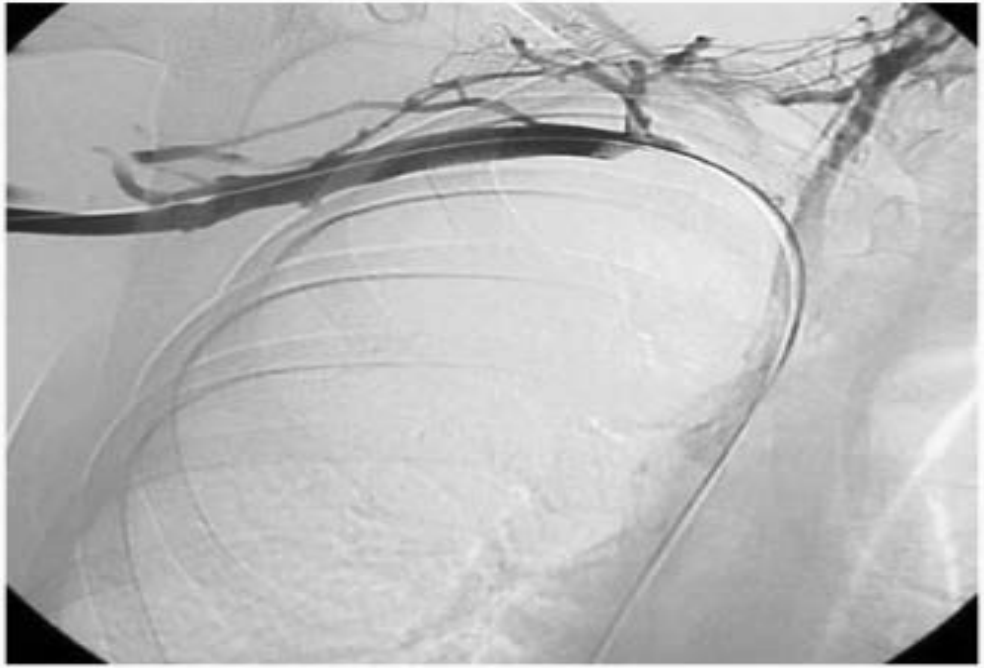




Intraluminal Thrombus



Subclavian Occlusion



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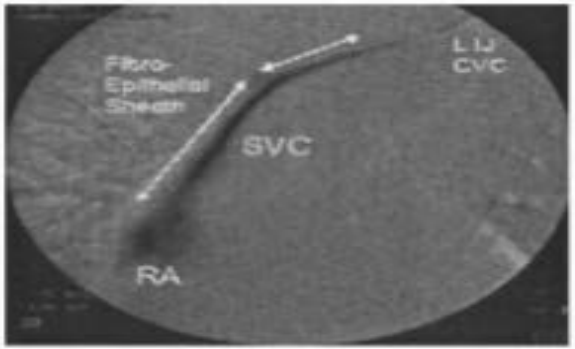
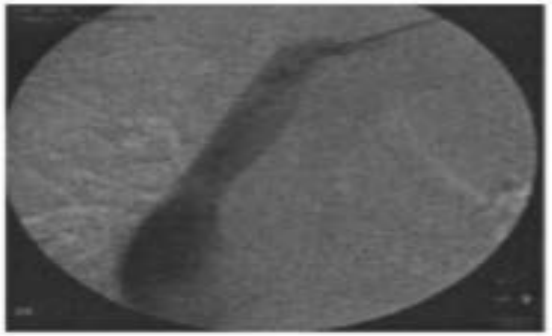
Fibrin Sheath

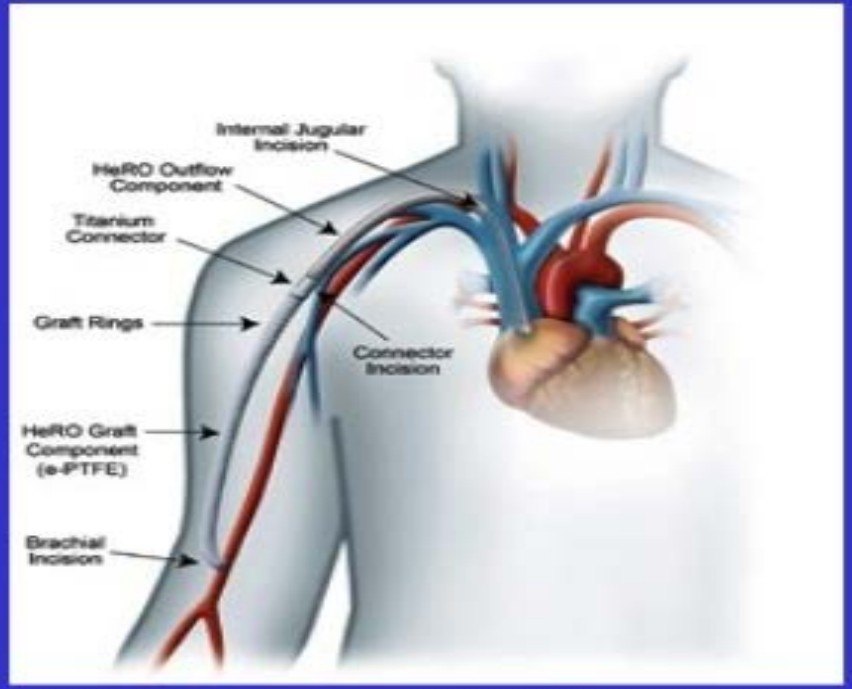


A

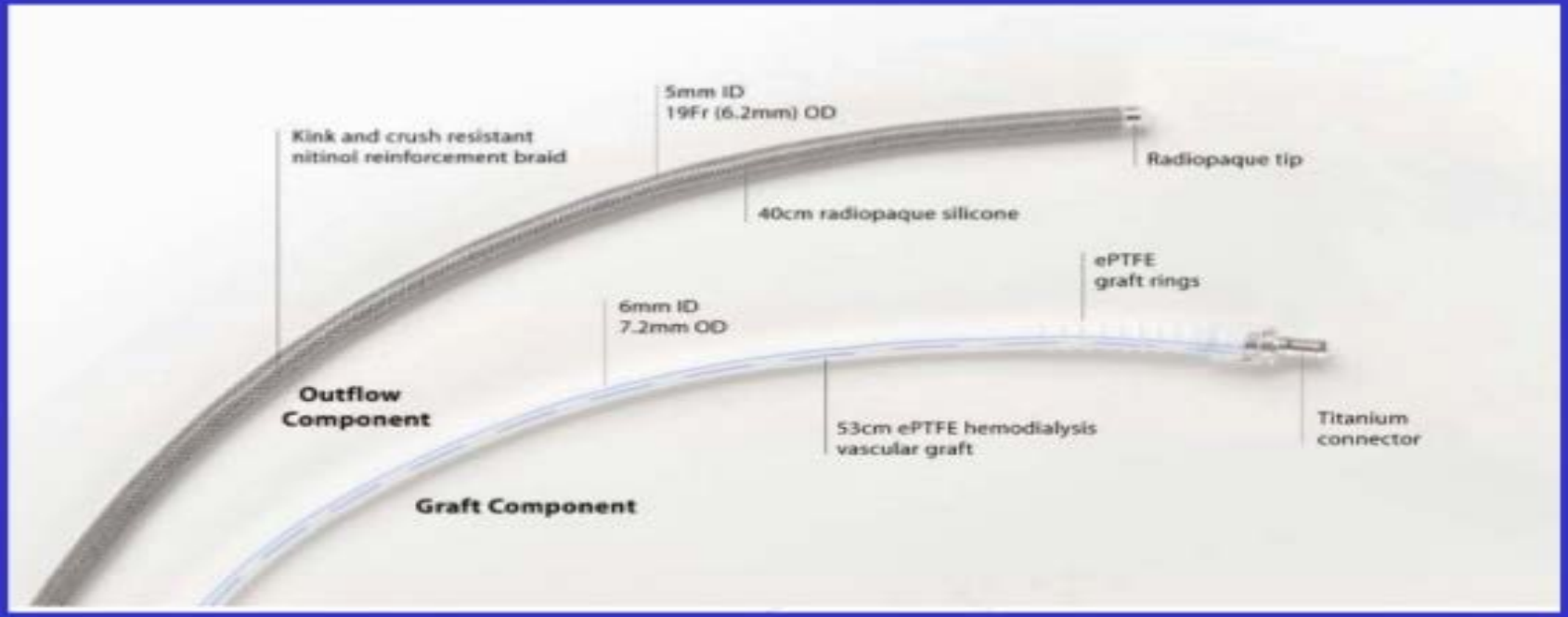


B

Hero Anatomy

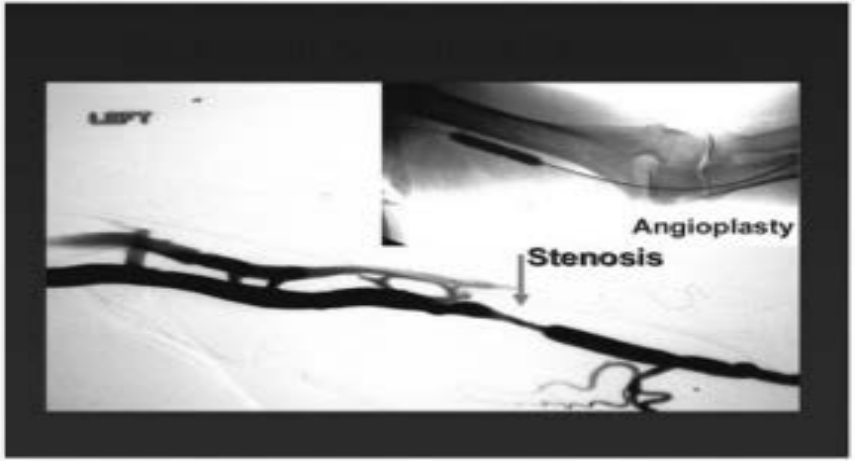


HERO Catheter



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



KDOQI Guideline 4
Treatment of Stenoses

Stenoses should be treated if:

Clinical or physiologic abnormality

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

+

Anatomic abnormality

- > 50% 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

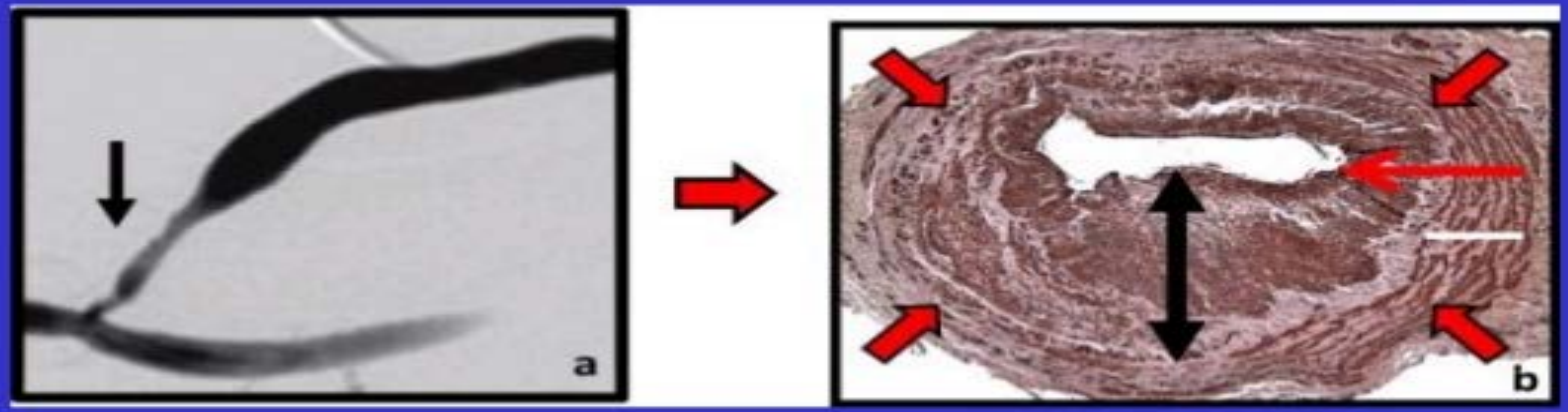
Access Maturation Definition

- **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


a
b

PTFE* Graft

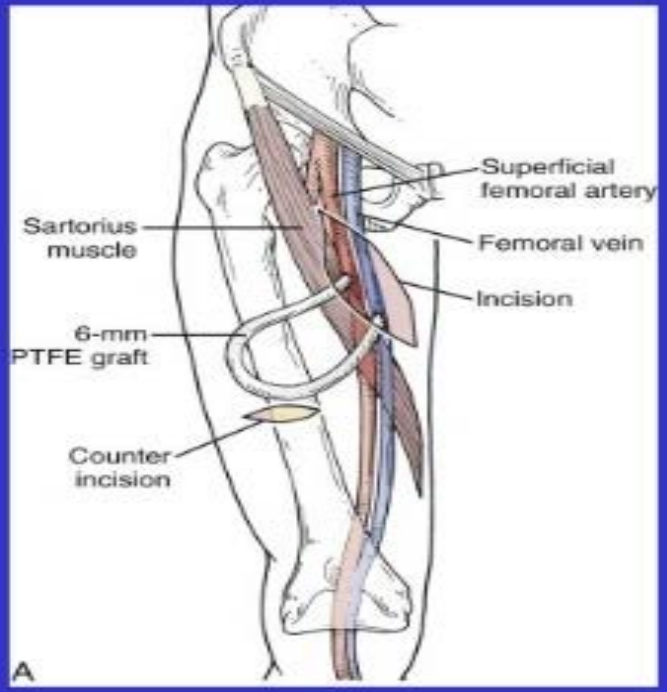
- usually placed in the nondominant forearm

- 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.

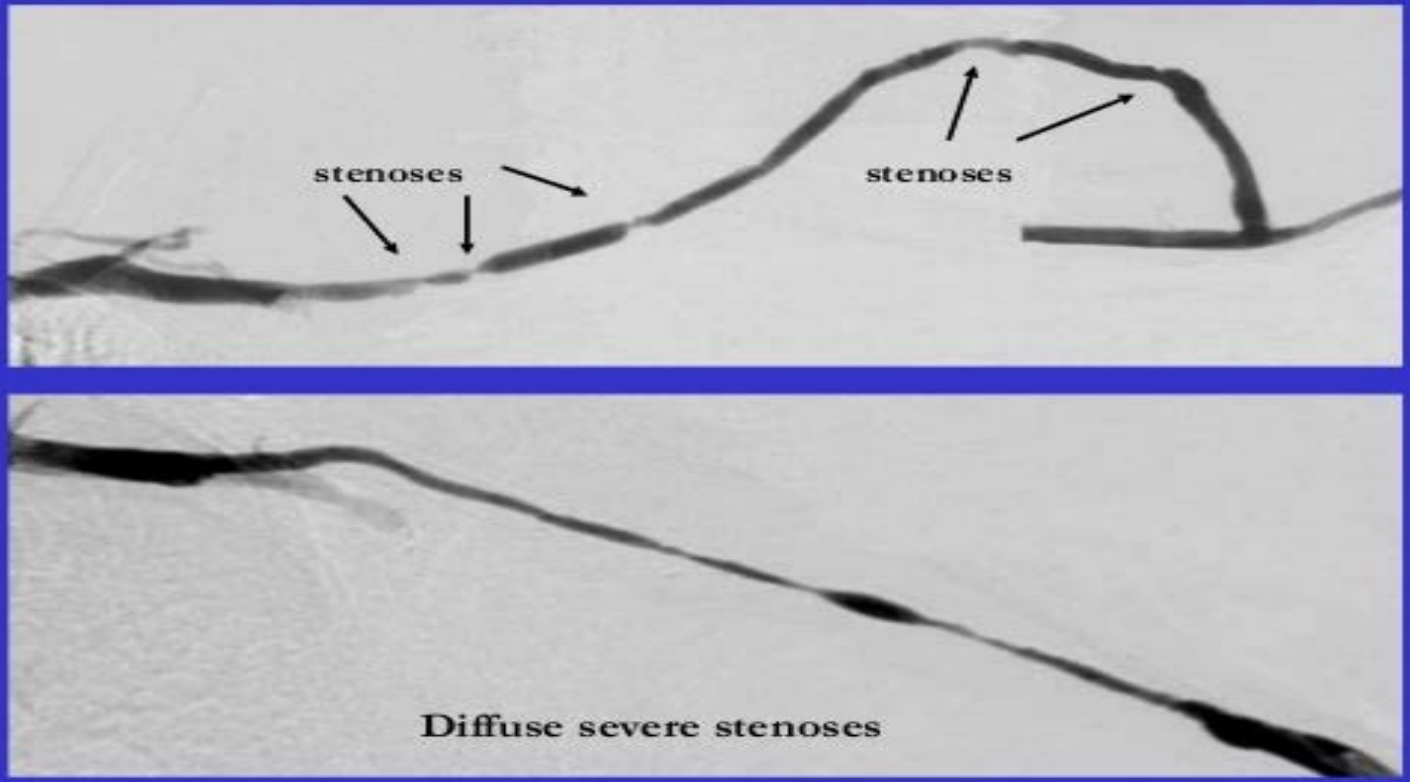
ESRD stages of Management

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

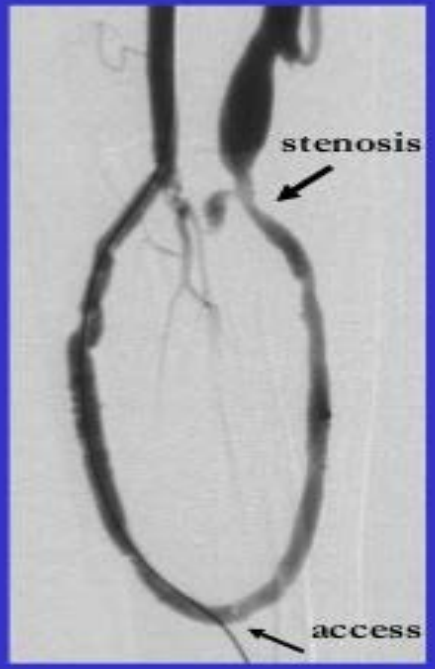
Nonmaturation vs Unusable

- 6 mm
- 600ml/mm
- 6 mm surface
- At least 6 mm in length

Multiplicity of Lesions



Angioplasty Procedure



Diagnostic fistulogram

vascular sheath

position angioplasty balloon across stenosis

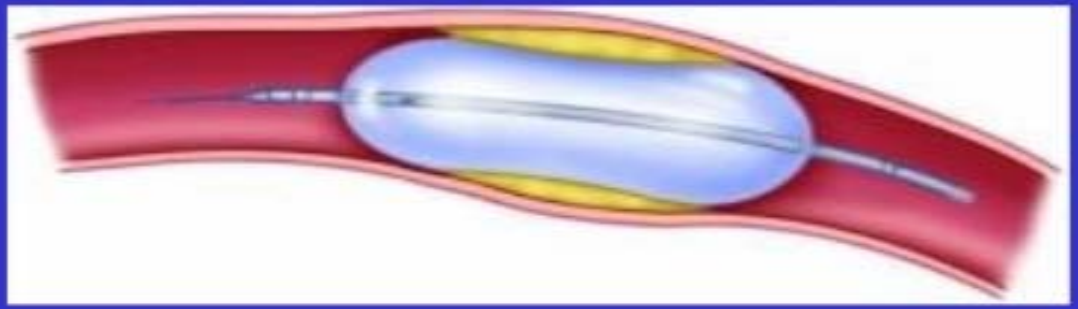
fully inflate balloon

Selecting the Appropriate Angioplasty Balloon

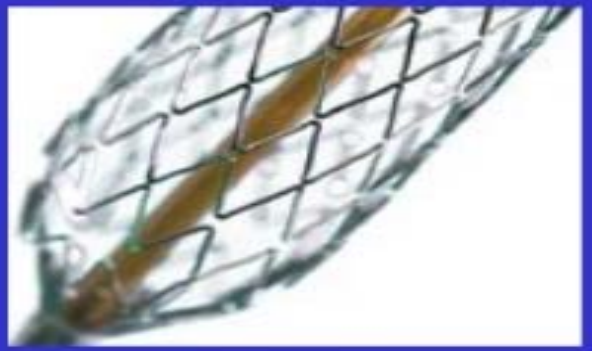
In general, high pressure balloons are used for angioplasty of neointimal hyperplastic stenoses

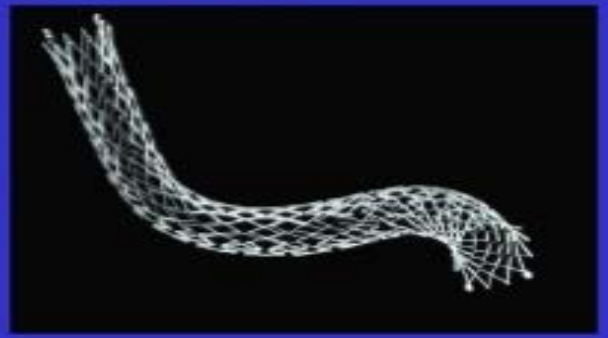
Primary selection criteria :

- Length
- Diameter



Endovascular Stents





Questions?

- Thank you for your time!