Vascular Access for Dialysis

ST5 ASPIRE Course

April 2019

Increasing problem

- 1 in 8 in UK will develop CKD
- 19 a day go on to CKD5
- 64,000 in UK currently CKD5D

- Lack of donor organs generally
  - 80% of transplant list awaiting kidney
  - Average is a 3 yr wait for transplant

Vascular Access for dialysis

Vascular Access for dialysis

- Quinton-Scribner shunt 1960

  Good flows and immediate access BUT

  Prone to infection & thrombosis

Cimino-Brescia 1966 (Appel)

Native A-V fistula

Straightforward to construct

Numerous variations BUT

Failure rate,

Maturation time (bridging access)

Patency (non modifiable)

Factor	Best evidence	Limitation
Age	Meta analysis	RC only
Diabetes	P Series	Distal AVF most affected
Hypotension	P Series	Diastolic most predictive
Vessel diameter	Meta analysis	A + V 2mm @ wrist V 3mm @ ACF
PVD	P Series	ABPI and IMT both increase failure risk
Arterial flow	P Series	Higher RI or red hyperaemic PSV response = lower AVF flow and 2nd patency rates
V distensibility	P Series	Poorly reproducible in vivo

Patency (modifiable)

Factor	Best evidence	Limitation
Smoking	P Series	Negative effect on patency
Obesity	P Series	Effect only with BMI >35
AVF in pre dialysis	R Series	Earlier better – no evid optimal
US mapping	RCT	Routine duplex recommended
Anastomosis type	RCT	End to side – less venous hypertension
Vascular Clips	RCT	Single small trial only
Antiplatelets	RCT	Prevent thrombosis but no overall effect on functional patency

Adjuncts to patency

- Systemic anticoagulation
  - Topical irrigation usual
  - Evidence for improved patency (AVF only) but with significant risk bleeding
- GTN patches post op
  - RCT suggests no effect
- Far Infrared therapy
  - Good RCT evidence of benefit
- Cannulation technique
  - Button hole aids self care but at higher risk of infection (RCT)
  - Cohort studies show benefit to patency from rope ladder puncture
  - US guided improves accuracy (no evidence for patency – yet)

Vascular Access for dialysis

- Planning
  - Arm before leg
  - Non dominant arm first
  - Distal to proximal
  - Create pre-emptively
  - Venous real estate
    - Look many years into the future
    - Avoid arm veins for venepuncture / cannulation
  - Preserve central veins as much as possible

Vascular Access for dialysis

Clinical exam and radiology

Warm room

Palpate cephalic vein

TOO GOOD TO BE TRUE VEINS!

- Shoulder collaterals!

Palpate pulse

Allens test

Duplex +/-Venography

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Suitable artery - Good inflow

Suitable vein - Unimpaired outflow

Vascular Access for dialysis

Graft AVFs

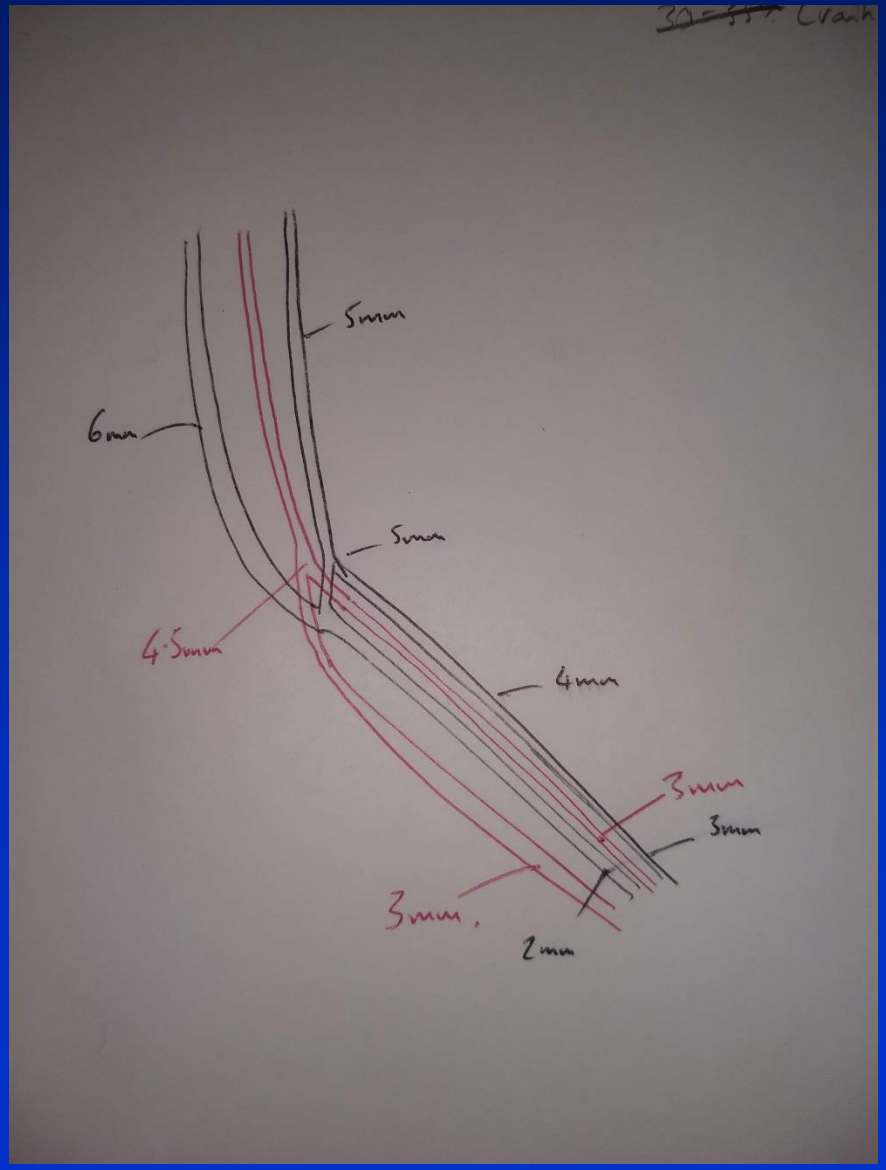
- Arm or leg
- Brachial or Radial
- Cephalic/Basilic/Axillary/Jugular
- Loop or straight
  - INFECTION

Gaining importance

- Consistent quality
- Low early failure (?better in elderly diabetics)
- “Early stick” grafts may replace CVC (early RCT)

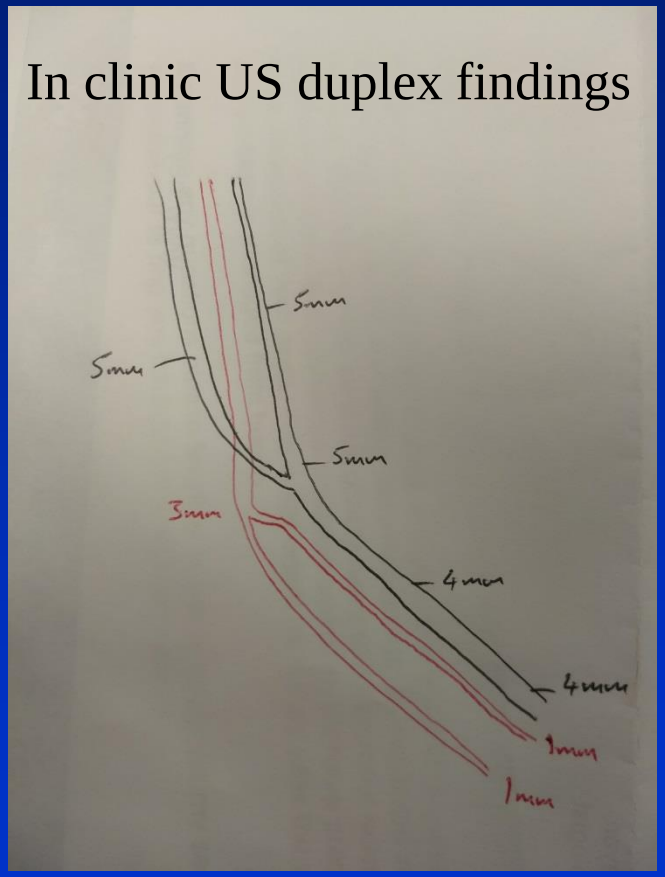
Case

- Planning an AVF
- 55 male builder
- Pre dialysis
- Sites available



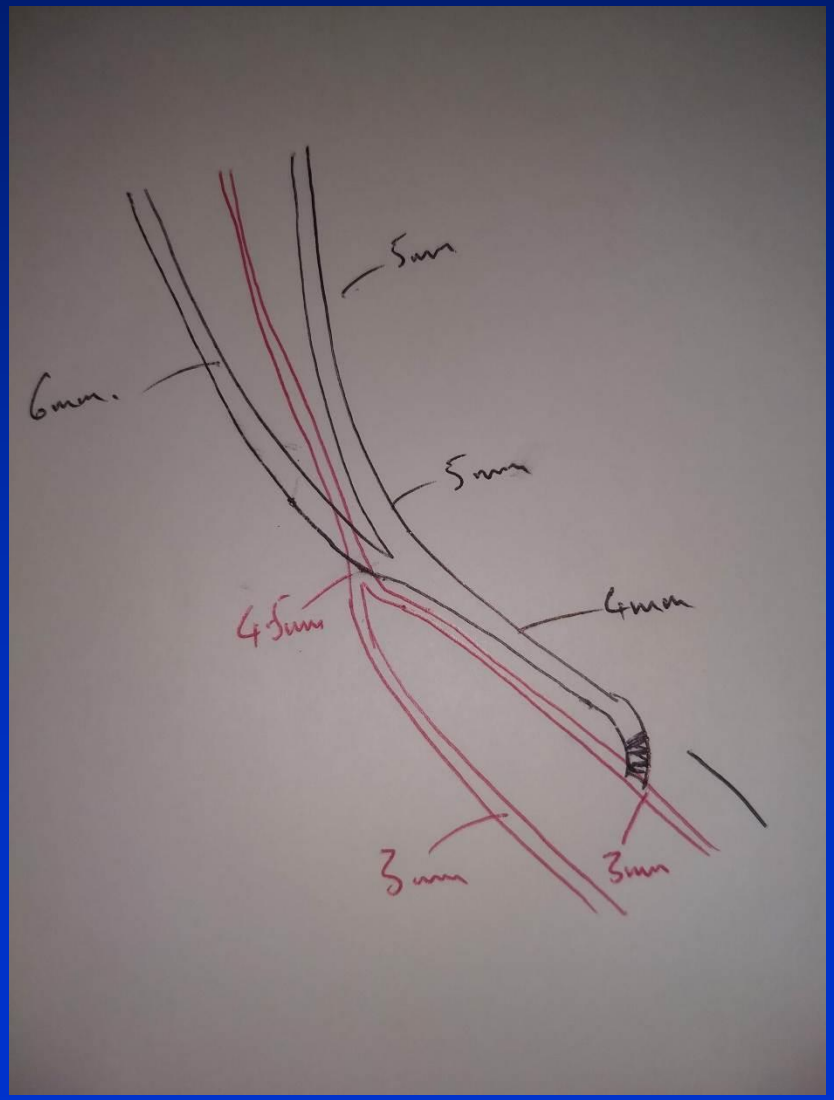
Case

- 34 Female
- IGA nephropathy
- Line in situ
- Assess for AVF



Case

- 45 Male
- pre dialysis but now symptoms
- Failed left RC identified this admission
- ? CVC and new access



Case

- 63 Male
- Pre dialysis
- BC AVF 4/12 ago
- Pain in hand
- Minor injury to index finger – non healing

Tordoir Scores

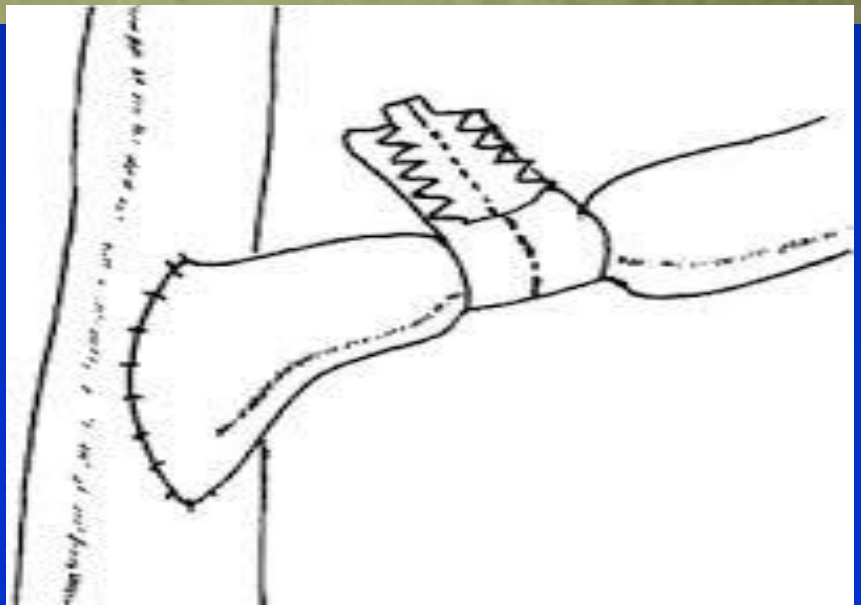
- 0 - no symptoms
- 1 – cyanosis, no symptoms
- 2 – claudication
- 3 – rest pain
- 4 – gangrene.

Investigation

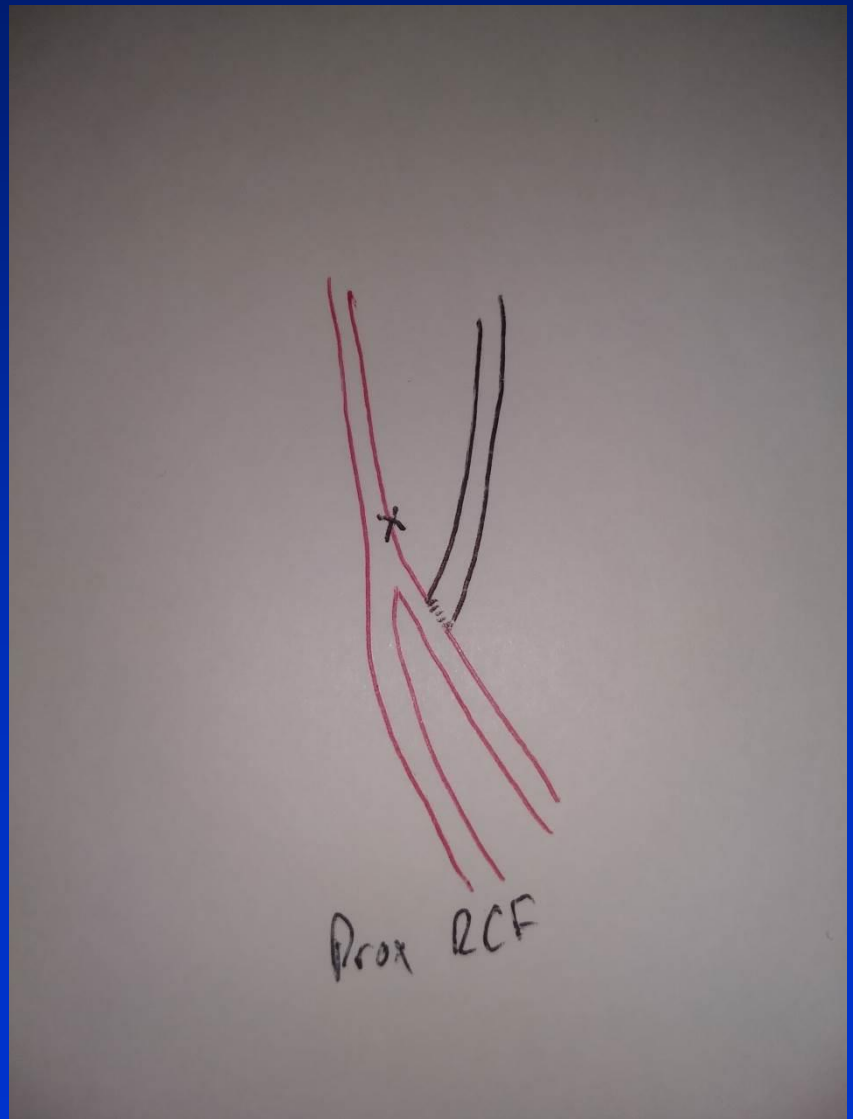
- Digital pressures
  - With AVF open
  - With AVF occluded
- Arteriogram with runoff views

DASS

- Options for Mmt
  - DRIL
  - RUDI
  - BANDING
    - Xmas tree
    - PPG



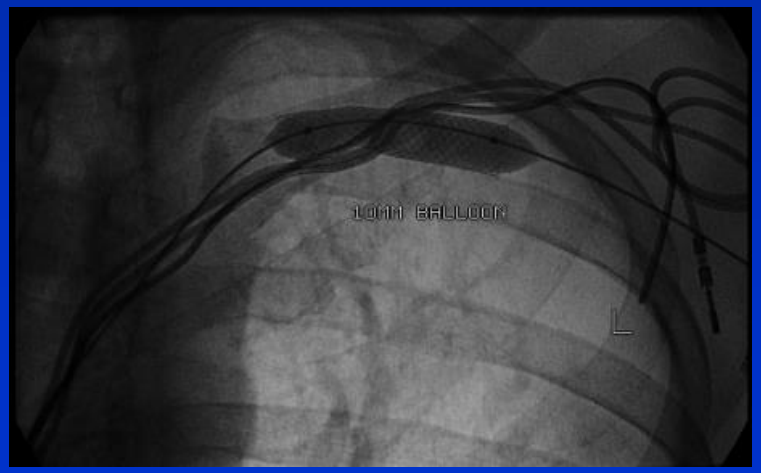
Preventing DASS

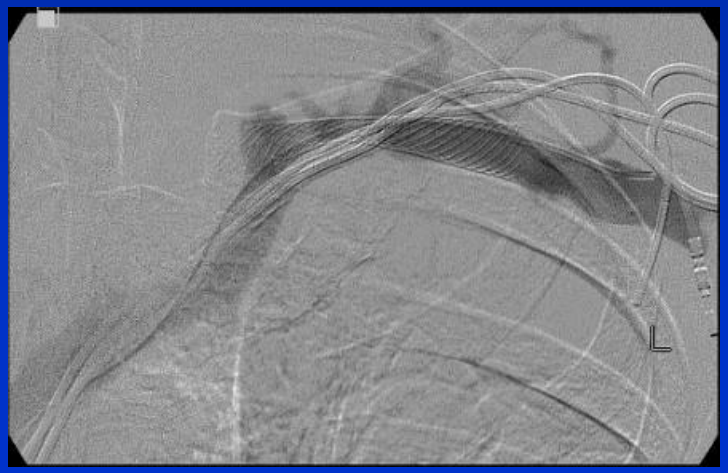


Case

- 67 male
- PPM L side 5 yrs ago, infected box removed unable to remove wires
- CKD5D
- L radiocephalic fistula
- 1st dialysis – venous needle to AVF 5 weeks later
- L arm swollen ++

Venogram & stent





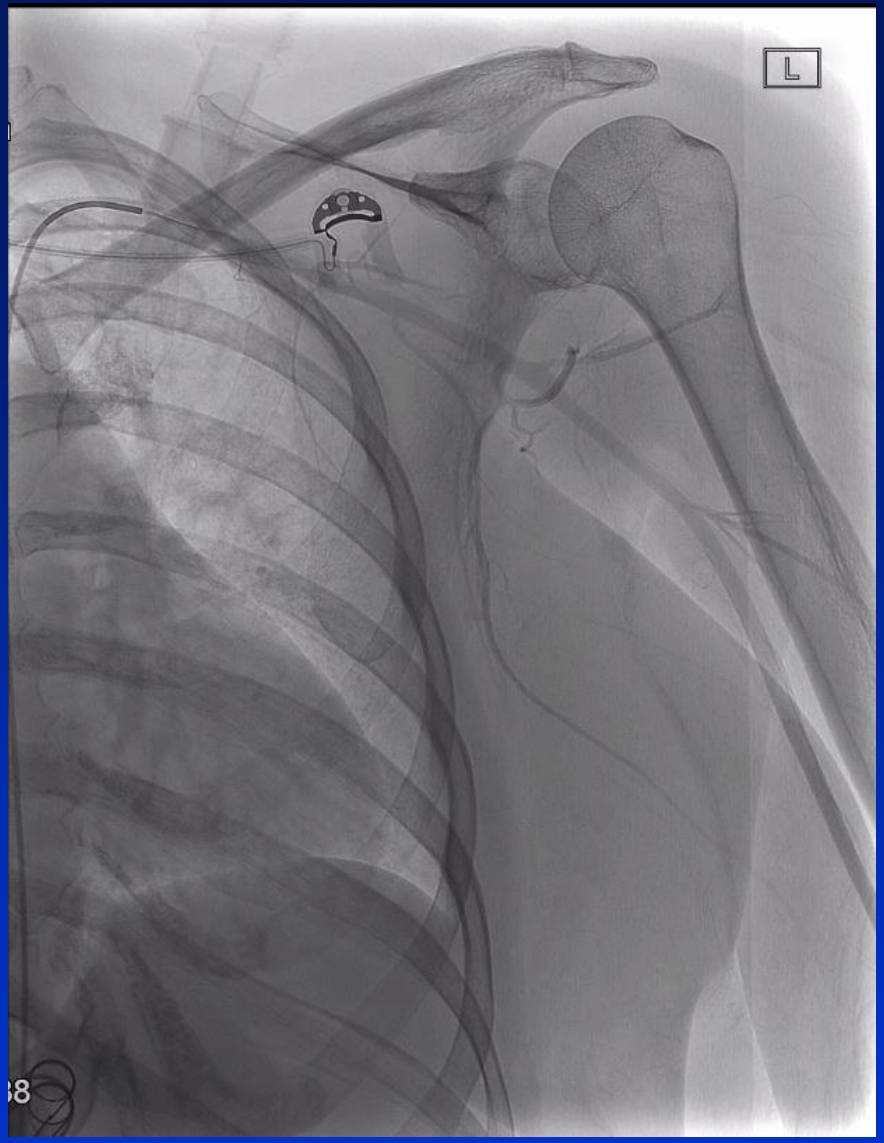
Post stent

Case

- 58 Male
- AVF 3 years ago
- Good dialysis
- Referral to clinic by concerned GP
- Patient asymptomatic

Case

- 48 Female
- PCKD currently on PD but moving to HD
- AVF 8 weeks ago
- Not maturing
- Duplex abnormal radial flow at wrist.
- Fistulogram arranged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