Post Transplant AV access
To keep or to ligate?

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Disclosures

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None related to current presentation



74 yr. old male dialysis start Feb. 2003
2 stage functional AVF since Jan. 2004
Working Kidney transplant Dec. 2005
Pain in and redness of 1 week on AV
History of bilateral failed AVGs
Creatinine 2.1 BUN 38

US thrombus near inflow sluggish flow

1. **Non-surgical management**
2. **Excision of AVF**
3. **AVF salvage**
4. **Interventional thrombolysis**







1. Non-surgical management
2. Excision of AVF
3. **AVF salvage**
4. Interventional thrombolysis

Excision of infected thrombus
Repair outflow vein
Skin flap reconstruction

78 yr. old female transplanted on August 2013seen in clinic in 2016
H/O mild arm pain and shoulder discomfort. Worried about AVG complications

- P/H: AVG placed in 3 yr ago ; thrombectomy and revision 7 days later
- 20 angioplasties to keep it open till Kidney transplant on Aug, 2013
- No angioplasties since
- BUN - 19, Creatinine - 1.9

Clinical eval: Evidence of chest and shoulder collaterals, No arm edema, Patent AV Graft
Access flow volume 958ml/min (brachial artery)

a. **Ligate and excise the AVG**
b. **Ligate AVG**
c. **Angiography and venoplasty**
d. **Counselling and no active intervention**

Reassurance, education about natural history of access behavior following transplant, information on to expect and when to call - No active intervention

Approaches to the transplant patient with an AV access

Outline

- Prevalence of the problem
- State of transplantation for ESKD in the US
- Transplant graft survival
- Natural history of AVA after transplant
- Utility of patent access in a transplant patient
- Recommendation
- Management options

Kidney transplantation in US

- Over 91,000 adults and children are currently waiting for a kidney in the U.S.
- In 2023, ~47,800 new candidates were added and ~28,100 kidney transplants were performed.
- Patients who lose their graft may re-enter the same supply-demand mismatch.
- OPTN/SRTR 2023 ADR: 10.8% of adult waitlisted candidates had a prior kidney transplant.
- ~ 50 -60% patients losing an allograft are candidates for relisting

http://optn.transplant.hrsa.gov/converge/latestData/rptStrat.asp

Kidney grafts do not last forever

- Median graft survival (SRTR data) for decease donor kidney ~11.7 years in the 2014-2017
- Living-donor kidney: median ~19.2 years in 2014-2017.
- Many patients transplanted today will outlive their graft.
- Median wait time on the list is 3-5 years
- Planning for the possibility of graft loss is not pessimism; it is actuarial reality.
- If the original access was preserved, they often have immediate, durable access.
- If it was ligated, they need a new access — and the venous anatomy is not always cooperative

Natural history VA after transplant

	Good access	Access with problems
AVF	Stays open May present with complications	Presents with complications May thrombose
AVG	Often clots	Always clots
Catheter	Removed	Removed

Causes for hypocoagulability in ESRD

- Uremic platelet dysfunction
- Anemia
- Uremic toxins
- HD induced
- Anticoagulants induced

Wattanakit K. JASN 08: 135

Normal functional AV access

AVFs are difficult to establish. High failure rates.
Once functional last for along periods
AVG Small percentage ~ 20-30 function well for long periods

A normally functioning AV access has known ill effects on longevity

Other than Patient's preference there are no justifiable reasons to ligate aail normally functional AV access

Patient preference – needs honest counselling to drive the decision to ligate

Advantages of a functioning access

- **Access available in case of urgent need**
  - **delayed graft function**
  - **acute rejection**
  - **Allograft failure**
- **May delay allograft loss**

Creating new access after kidney loss could be influenced by central interventions for transplant, age and immune suppression related vascular disease, prior TDC, prior AVF/AVG attempts, pacemaker leads etc.

Disadvantage

High output cardiac complications??

Distal limb ischemia

Non thrombotic access complications

Cosmetic concern

Benard V et.al. BMC Nephrol 2019; 20: 420

Recommendations

Routine access monitoring in post-transplant phase
Clinical exam &Ultra sound evaluation

Asymptomatic functioning access

no intervention

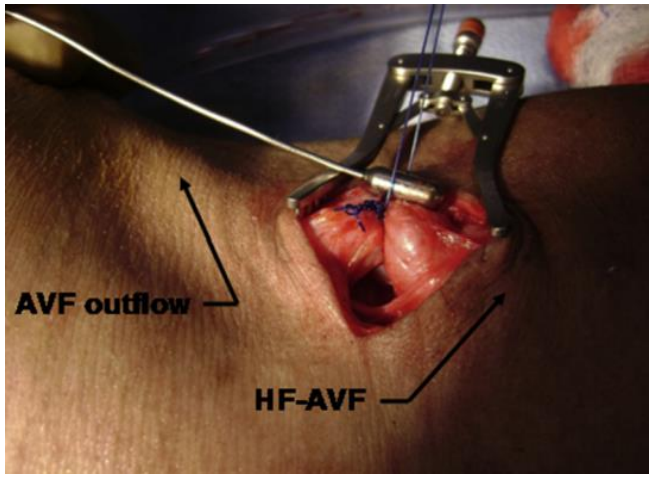
Symptomatic Dysfunctional access

tailored approach

Management decisions based on transplant kidney function and the expected outcome and magnitude of the intervention

Cardiac concerns

- **First RCT of AVF ligation vs. no intervention in stable KTRs >12 months post-transplant. Ligation: significant reduction in LV mass, volumes, atrial areas, and NT-proBNP.**
- **No definiitive evidence to prove flow >1500ml/min in AVA to cardiopulmonary disease, CHF or pulmonary hypertension**



- **Precision flow reduction is a simple procedure**

Martinez-Gallardo R et.al. Nefrol 2012;32:206-12;
Reddy NVY et.al. Eu Heart J 2017;38:1913-1923;
Basile C et.al.Nephrol Dial Tx 2008; 23:282-287;
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Voorzaat BM, et al. J Vasc Access 2016.

Interventions to consider in post-transplant patients

Flow reduction → **Symptomatic**

Flow reduction → **Extreme high flow**

Aneurysm repair → **Symptomatic**

Aneurysm repair → **At risk**

Aneurysm repair → **Cosmetic?**

Stent/angioplasty → **Only for access that need be used in a finite time**

Common presentations and questions

Acute thrombosis presents with pain, swelling over AVF, redness and associated with all signs of inflammation

Most patients need reassurance and

symptomatic management

antibiotics are rarely necessary

short course of oral antibiotics causes no harm

Excision of access is rarely indicated

Advantage: outflow vein stays open beyond the entry of a tributary inflow for future use

Common presentations and questions

Acute access thrombosis
Does the patient need anticoagulation?

Thrombosis often is a result of stasis
Stasis is a result of outflow stenosis
Stenotic outflow does not permit clot migration

Anticoagulation prevents clot propagation
does not help clot dissolution

Summary

Transplant provides efficient renal replacement for a finite period

HD remains is the mainstay for renal replacement therapy

Vascular access is the life-line for an ESRD patient

Most AVG thrombose after transplantation

Few AVF with significant outflow problems thrombose after transplantation

Following transplant all access need monitoring

Decision to intervene on VA problems should be based on transplant function and results of intervention