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Predialysis Vascular Access Surgery in Patients With Failing Kidney Transplants

Dalia Dawoud, MD, James Harms, MD, Timothy Williams, MD, and Vineeta Kumar, MD
Michael Allon, MD University of Alabama at Birmingham, Birmingham, AL

To the Editor:

Despite ongoing national initiatives to maximize arteriovenous fistula (AVF) use and minimize central vein catheter (CVC) use in HD patients ¹, 82% of US CKD patients initiate HD with a CVC ². Substantial research has addressed the potential hurdles to enhancing predialysis vascular access management in patients with advanced CKD ^{3,4}. New AVFs frequently require surgical or percutaneous interventions to promote maturation, leading to long delays before they are suitable for HD. Thus, it is recommended that AVF be placed in CKD patients at least 6 months prior to the expected date of HD initiation ¹. Not surprisingly, patients with longer predialysis nephrology follow-up are more likely to initiate HD with a mature AVF.

Many patients with failing kidney transplants eventually require HD, but there is surprisingly little literature on vascular access management in this population. We compared vascular access management in patients with failing kidney transplants to that in patients with failing native kidneys, focusing on the subset of patients with close nephrology follow-up prior to initiating HD. Using our institutional registries, we identified 767 patients with failing native kidneys and 340 patients with failing transplants followed at the University of Alabama at Birmingham (UAB) who initiated HD during the 5-year period beginning January 1, 2006. After applying several exclusion criteria (Fig 1), the final study population included 218 patients with failing native kidneys and 96 with failing transplants.

Consent for review of patients' medical records for research purposes was obtained from the UAB Institutional Review Board. Two full-time vascular access coordinators maintained a prospective, computerized database of the vascular access procedures. We ascertained for each patient whether vascular access surgery was performed before initiation of HD and the type of vascular access (fistula or graft) placed. We also extracted demographic and comorbidity information from the electronic medical record.

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Corresponding author: mdallon@uab.edu.

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Predialysis vascular access surgery was less common among patients with failing transplants than those with failing native kidneys (25% vs 60%; HR, 0.42; 95% CI, 0.29-0.60; $p<0.001$; Fig 1). Among those patients with predialysis access surgery, a similar proportion received an AVF (67% vs 75%, $p=0.4$). As compared to patients with failing native kidneys, those with failing transplants were younger, less likely to be black, and had a lower frequency of CHF (Table 1). The two groups were similar in gender, diabetes, PVD, CAD, CBVD, and eGFR at initiation of HD. Three months prior to HD initiation, eGFR was higher in those with failing transplants versus those with failing native kidneys (median, 17 vs 14 ml/min/1.73 m²; $p=0.02$)

Patients with failing transplants are more likely than those with failing native kidneys to have suboptimal management of hypertension, proteinuria, anemia, and hyperlipidemia⁵. A preliminary report suggested suboptimal vascular access management in patients with failing transplants, with 47% still catheter-dependent one month after initiating HD, but did not provide comparable data from patients with failing native kidneys⁶. The current study extends these findings by demonstrating that patients with failing transplants are substantially less likely than those with failing native kidneys to have vascular access surgery prior to initiation of HD, despite prolonged nephrology follow-up. This discrepancy is particularly notable because the patients with failing transplants had a lower prevalence of factors associated with AVF failure (older age, black race, and heart failure)⁷.

Our study has some limitations. First, the analysis was retrospective. The existence of dialysis and transplant registries, as well as the prospective data collection on vascular access procedures, provides confidence that the information was accurate and complete. Second, our observations represents the experience of a single medical center, and may not be generalizable. Third, many of the patients with failing transplants initiated HD at centers outside of UAB, so it was not possible to reliably establish whether their access could be used upon initiation of HD.

Why might vascular access management differ in patients with failing transplants than in those with failing native kidneys? Both patients and nephrologists are reluctant to acknowledge allograft failure⁸. As a consequence, medical management focuses on salvage of the allograft by manipulating the immunosuppressive regimen. This may lead to excessive delays in initiating dialysis in this population⁹. If these patients were viewed as having advanced CKD, there might be a heightened emphasis on consensus guidelines for medical management of patients with failing native kidneys¹⁰. Other potential explanations for the discrepancy in predialysis access placement include ambiguity about whether the transplant nephrologist or clinical nephrologist is responsible for scheduling access surgery, and the possibility of faster CKD progression in patients with failing kidney transplants (as suggested by the higher eGFR 3 months prior to HD).

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Figure 1. Patient selection

Exclusions: patients who started peritoneal dialysis (PD), those with less than 1 year of nephrology follow-up or fewer than 3 nephrology clinic visits, or (for those with failing kidney transplants (KTx)), patients who initiated HD with an AVF placed prior to transplantation.

Table 1

Demographic and clinic features

Variable	Failing kidney transplant	Failing native kidney	P-value
No. of patients	96	218	
Age, y	45±14	60±14	<0.001
Age ≥ 65 y	9 (9%)	84 (38%)	<0.001
Male sex	50 (52%)	109 (50%)	0.7
Black race	51 (53%)	170 (78%)	<0.001
Diabetes	46 (48%)	130 (59%)	0.05
CHF	7 (7%)	41 (19%)	0.009
CAD	14 (14%)	49 (22%)	0.1
PVD	8 (8%)	17 (8%)	0.9
CBVD	10 (10%)	34 (16%)	0.2
eGFR at HD initiation (ml/min/1.73 m ²)	10.4±4.6	10.8±3.7	0.5

All patient characteristics are at the time of dialysis initiation. Values given as count, mean $\pm$ SD, or number (percentage).

CHF, congestive heart failure; CAD, coronary artery disease; PVD, peripheral vascular disease; CBVD, cerebrovascular disease; HD, hemodialysis; eGFR, estimated glomerular filtration rate