

Is an Arteriovenous Fistula or Graft the Better Access in Older Adults Who Have Initiated Hemodialysis With a Catheter?

Robert S. Brown

*"In theory, there is no difference between theory and practice. In practice, there is."*¹

Controversy over vascular access, the Achilles heel of hemodialysis (HD) patients,^{2,3} has continued since

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the initiation of the "Fistula First" initiative in 2003.⁴ However, this initiative resulted in the unintended consequences of increasing the proportion of central venous catheters (CVCs) as the percentage of arteriovenous (AV) grafts (AVGs) markedly decreased.⁵ Thus, Fistula First became "Fistula First, Catheter Last" in 2007.⁶ And as the end-stage kidney disease (ESKD) population changed to include more older and sicker patients, with those older than 65 years making up 52% of incident HD patients in the United States,⁷ the paradigm changed to "Patient First: ESKD Life-Plan" by the latest 2019 National Kidney Foundation Kidney Disease Outcomes Quality Initiative (KDOQI) guidelines.⁸ KDOQI now espouses that "attainment of the 'right access, in the right patient, at the right time, for the right reasons' is a more patient-centered approach to care, where population measures, such as percentage with arteriovenous fistulas (AVFs) created or used, or the percentage with hemodialysis CVCs may be unhelpful and counterproductive for patient-centered goals."⁸(p 536) Also, it has been noted that the elderly were less likely to have an AVF⁶ and have an AVF mature for HD use,^{9,10} and many AVFs were never used because of death or slower-than-expected progression to ESKD.^{11,12} With observational data showing that an AVG had a similar mortality rate as an AVF in elderly HD patients,¹³ it was reported that AVGs were being placed more frequently in elderly than in younger patients.⁷

Because prospective randomized clinical trials comparing an AVF to an AVG have not been done and observational studies may be influenced by patient selection bias, it remains uncertain whether placement of an AVF is superior to an AVG in older patients with ESKD. As described in this issue of *Kidney Medicine*, Robinson et al¹⁴ performed a randomized, parallel-group, open-label trial in patients 65 years and older to compare outcomes of creation of an AVF with an AVG. Older adults with no prior vascular access receiving maintenance HD through a CVC who were referred for access placement by their nephrologist were screened for the study. Clearly, as a prospective controlled trial to delineate the superiority of either an AVF or an AVG in the elderly with ESKD, this study was a failure.

But the authors are to be commended for their efforts because although the study failed to achieve useful results in that comparison, it showed how incredibly difficult it is to perform a randomized controlled trial in this population. Moreover, their results provide the nephrologist and surgeon with important descriptive data that will help with decisions in the management of older patients with ESKD.

Why did this study not meet its goal? What did its data tell us? During an 18-month period, 156 potential study patients 65 years and older were started on HD through a CVC. Of the 122 patients with no prior AV access surgery, 9% had a short survival expectancy and were not referred for AV access placement, 15% died before being referred to vascular surgery, 11% had vasculature considered unsuitable for an AVF, 8% opted for peritoneal dialysis, 7% refused study participation, and other causes left only 36 eligible patients evaluated by vascular surgery for AV access placement who consented and were randomly assigned. Then, of the 18 participants in each group, only 16 AVF patients received an AVF and 13 AVG patients received an AVG. Only 8 (50%) of the 16 AVF patients compared with 8 (62%) of the 13 AVG patients had their access successfully cannulated for HD. The median time to successful cannulation was 114 days for the AVF patients compared with a shorter median time of 75 days for the AVG patients, though other reports have suggested safe cannulation times of AVGs of less than 2 weeks.¹⁵ Endovascular procedures were performed on 44% of AVF accesses and 38% of AVG accesses, with surgical interventions performed in 25% and 23%, respectively. Access infections occurred in 2 (13%) AVF patients and 3 (23%) AVG patients, though were more serious in the AVG group, in which bacteremia led to removal of 2 AVGs.

None of these results were statistically significant due to the small sample size. However, their prospective findings confirmed much of what we expected from observational reports comparing AVF versus AVG placement in older adults; there may be little reason to choose one over the other before evaluating an elderly patient.^{8,16} Moreover, that only 23% of screened patients were able to be enrolled in this study has prompted the authors to propose that "well-powered multicenter clinical trials are necessary to guide decision makers in this area."¹⁴ My opinion is that such studies will not produce results useful enough to warrant their effort and expense.

First, the number of patients screened would have to be enlarged by 10 times because presumably 1,560 elderly patients receiving HD with a catheter would be needed to end up randomly assigning about 360 participants. And



at best, reasonably expected data from that number (using 62% vs 50% success rates) might show a marginal advantage of successfully using an AVG over an AVF at a borderline significant $P < 0.05$ (but not $P < 0.01$). More importantly, whatever significant advantage of either access was found in such a study, the strategy preference will pertain to only a small percentage of uncomplicated older adults with ESKD who are similar to the 23% enrolled in this study.

For the remaining three-quarters, this trial has documented what we already should know. The elderly come to us with the baggage of advancing age; comorbid conditions, arterial disease, poor veins, short expected survival time, or strong life preferences, which should lead the wise nephrologist and vascular access surgeon to create the “right access” for that specific patient. And in a minority, that may even be staying with a tunneled CVC because it appears that patient selection factors account for most of the better survival of an AVF.^{17,18} That is what this trial really showed; for now, we must do our best to tailor the particular shortcomings of the suboptimal vascular accesses available³ to the needs and preferences of older adults with ESKD choosing HD. That is what a good physician practicing personalized medicine does!

ARTICLE INFORMATION

Authors' Full Names and Academic Degrees: Robert S. Brown, MD.

Author's Affiliation: Beth Israel Deaconess Medical Center, Boston, MA.

Address for Correspondence: Robert S. Brown, MD, Beth Israel Deaconess Medical Center, Renal Division, Department of Internal Medicine, 330 Brookline Ave, Boston, MA 02215. E-mail: rbrown@bidmc.harvard.edu

Financial Disclosure: The author declares that he has no relevant financial interests.

Peer Review: Received January 26, 2021, in response to an invitation from the journal. Direct editorial input by the Editor-in-Chief. Accepted in revised form January 31, 2021.

Publication Information: © 2021 The Author. Published by Elsevier Inc. on behalf of the National Kidney Foundation, Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Published online March 5, 2021 with doi [10.1016/j.xkme.2021.03.001](https://doi.org/10.1016/j.xkme.2021.03.001)

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