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Patency and Survival of Forearm Versus Upper Arm Arteriovenous Fistula in Elderly Hemodialysis Patients

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Objectives : Arteriovenous fistula (AVF) has been considered as the preferred vascular access for hemodialysis because of its superior patency and better survival outcomes. Radiocephalic AVF is generally recommended the first option; however, upper arm AVF (brachiocephalic or brachio basilic) is frequently chosen in elderly patients with poor vascular conditions. As the mean age of hemodialysis patients has increased, the use of upper arm AVF has also increased. This study aimed to compare patency and patient survival between forearm and upper arm AVF, particularly in elderly patients.

Methods : We conducted a retrospective observational study using the Clinical Data Warehouse of the Catholic Medical Center (CMC-CDW) and included patients who underwent vascular access creation between 2015 and 2024. Patients were classified into forearm and upper arm AVF groups. Primary, primary-assisted, and secondary patency and patient survival were compared. Subgroup analyses were performed according to age (65–69, 70–79, 80–89, and ≥90 years).

Results : Among 2,205 patients, 1,156 (52.4%) were in the forearm AVF group and 1,049 (47.6%) were in the upper arm AVF group. In multivariate Cox regression analyses, upper arm AVF (vs. forearm AVF) showed no significant differences in primary patency (adjusted hazard ratio [HR], 1.056; 95% confidence interval [CI], 0.895–1.245; P=0.519), primary-assisted patency (HR, 1.344; 95% CI, 0.971–1.861; P=0.075), and secondary patency (HR, 1.021; 95% CI, 0.881–1.183; P=0.785). In the subgroup analysis of elderly patients (≥65 years), primary patency was also not significantly different between the two groups (Table 1). In contrast, upper arm AVF was associated with increased risk of mortality in the overall cohort (HR, 1.517; 95% CI, 1.193–1.927; P<0.001). In Kaplan–Meier analyses by age subgroup, a significant survival difference was identified in patients aged 70–79 years (log-rank P=0.025, Figure 1).

Conclusions : Upper arm AVF showed no patency advantage and was associated with higher mortality, particularly in older patients.

Table 1.jpg



Table 1. Cox regression analysis of primary patency according to age groups (≥ 65 years)

Upper arm AVF vs. Forearm AVF (reference)		
Subgroup	HR (95% CI)	P value
Age, yr		
$65 \leq \text{Age} < 70$	1.080 (0.790–1.470)	0.620
$70 \leq \text{Age} < 80$	1.030 (0.830–1.270)	0.790
$80 \leq \text{Age} < 90$	1.110 (0.790–1.550)	0.540
$90 \leq \text{Age}$	1.360 (0.370–5.020)	0.640

HR: hazard ratio; CI: confidence interval; AVF, arteriovenous access

Table 1.jpg

Figure 1. Kaplan-Meier Survival Curves: Upper arm AVF versus Forearm AVF

(A) Age 65-69 years, (B) Age 70-79 years, (C) Age 80-89 years

