INTIMAL HYPERPLASIA AND STENOSIS IN ARTERIOVENOUS FISTULA MATURATION FAILURE

IN HEMODIALYSIS FISTULA MATURATION STUDY

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SUPPLEMENTAL MATERIALS

Supplemental Table 1. Maturation outcomes by sex and AVF location.

		Upper Arm (159 females, 300 males)			Forearm (20 females, 123 males)		
Sex	Maturation Outcome	Failed	Matured	Indeterminate	Failed	Matured	Indeterminate
Female	Unassisted	96 (60.4%)	59 (37.1%)	4 (2.2%)	15 (75.0%)	4 (20.0%)	1 (5.0z%)
Female	Overall	58 (36.5%)	93 (58.5%)	8 (5.0%)	9 (45.0%)	9 (45.0%)	2 (10.0%)
Male	Unassisted	141 (47.0%)	147 (49.0%)	12 (4.0%)	61 (49.6%)	53 (43.1%)	9 (7.3%)
Male	Overall	68 (22.7%)	214 (71.3%)	18 (6.0%)	31 (25.2%)	80 (65.0%)	12 (9.8%)

Supplemental Table 2. Prevalence of juxta-anastomotic and distal stenosis on three post-operative ultrasounds.						
	Upper arm			Forearm		
Post-operative ultrasound time	n	Juxta-anastomotic stenosis	Distal stenosis	n	Juxta-anastomotic stenosis	Distal stenosis
Week 6[3]	430	14.2%	19.5%	126	20.8%	12.3%
Week 2	441	18.3%	13.1%	129	14.0%	11.0%
Day 1	450	11.8%	3.6%	137	10.2%	6.1%

Supplemental Table 3. Associations of preexisting venous intimal hyperplasia index with AVF stenosis stratified by stenosis location.[1]

Post-op ultrasound time	Juxta-anastomotic stenosis			Distal stenosis		
	OR[2]	95% CI	p[3]	OR[2]	95% CI	p[3]
Week 6[4]	1.01	0.92-1.10	0.90	1.09	1.00-1.20	0.06
Week 2	0.95	0.86-1.06	0.38	1.06	0.94-1.20	0.33
Day 1	1.01	0.89-1.13	0.92	1.09	0.91-1.30	0.33

[1]All analyses involved multiply imputed data.

[2]OR, odds ratio of developing stenosis, per 10% increase in intimal hyperplasia index, adjusted for age, sex, African-American race, chronic dialysis status at time of AVF creation, AVF location (upper arm vs. forearm), as well as inflow-artery diameter, mean vein diameter and brachial artery blood flow rate on pre-operative ultrasound, with clinical center modeled as a random variable.

[3]$p \leq 0.05$ is nominally considered to be statistically significant.

[4]Week-6 results were identified *a priori* as the primary ultrasound outcomes among the three time points.

Supplemental Table 4. Associations of juxta-anastomotic stenosis and distal stenosis on ultrasound at three post-operative time points with clinical maturation failure outcomes.[1]

	Post-operative ultrasound time point	Juxta-anastomotic stenosis			Distal stenosis			Ratio (juxta-anastomotic OR/distal OR)		
		OR[2]	95% CI	p[3]	OR[2]	95% CI	p[3]	OR[2]	95% CI	p[3]
Unassisted maturation failure	Week 6[3]	1.28	0.73-2.25	0.39	2.39	1.35-4.24	<0.0001	0.58	0.27-1.24	0.16
	Week 2	0.94	0.58-1.52	0.80	2.34	1.21-4.54	0.01	0.44	0.21-0.95	0.04
	Day 1	1.52	0.86-2.70	0.15	2.65	0.89-7.91	0.08	0.57	0.17-1.93	0.37
Overall maturation failure	Week 6[4]	1.64	0.92-3.26	0.10	1.74	0.92-3.26	0.09	0.96	0.40-2.26	0.92
	Week 2	1.42	0.84-2.42	0.19	1.52	0.81-2.82	0.19	0.93	0.48-1.88	0.86
	Day 1	2.49	1.35-4.58	<0.0001	1.48	0.56-3.91	0.43	1.63	0.53-5.04	0.40

[1]All analyses involved multiply imputed data.

[2]Models adjusting for pre-operative ultrasound measures included inflow-artery diameter, mean vein diameter and brachial artery blood flow rate. Models adjusting for concurrent ultrasound measures instead included mean AVF venous diameter, blood flow rate and depth obtained from the same ultrasound as the stenosis assessment. All models included additive adjustments for age, sex, African-American race, chronic dialysis status at time of AVF creation, and AVF location (upper arm vs. forearm), and Gaussian clinical center random effects.

[3]$p \leq 0.05$ is nominally considered to be statistically significant.

[4]Week-6 results were identified *a priori* as the primary ultrasound outcomes among the three time points.

Supplemental Table 5. Associations of stenosis on ultrasound at three post-operative time points with clinical maturation failure outcomes, adjusting for concurrent vein diameter.[1,2]

		Unassisted maturation failure			Overall maturation failure		
Ultrasound time point	Adjustment[2]	OR[3]	95% CI	p[4]	OR[3]	95% CI	p[4]
Week 6[5]	Concurrent ultrasound measures	1.17	0.66-2.06	0.58	1.21	0.71-2.06	0.48
Week 2	Concurrent ultrasound measures	0.88	0.54-1.43	0.61	1.09	0.65-1.84	0.74
Day 1	Concurrent ultrasound measures	1.13	0.64-1.99	0.67	1.42	0.78-2.58	0.25

[1]All analyses involved multiply imputed data.

[2]Adjustment for AVF venous blood flow rate, depth, and minimum instead of mean diameter obtained from the same ultrasound as the stenosis assessment, with additive adjustments for age, sex, African-American race, chronic dialysis status at time of AVF creation, and AVF location (upper arm vs. forearm), and Gaussian clinical center random effects.

[3]OR, odds ratio of developing stenosis, per 10% increase in intimal hyperplasia index.

[4]$p \leq 0.05$ is nominally considered to be statistically significant.

[5]Week-6 results were identified *a priori* as the primary ultrasound outcomes among the three time points.