Improved Maturation of Two-Stage Over One-Stage Basilic Vein Transposition: A Multivariate Model

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OBJECTIVES

To compare maturation and reintervention rates of 1- vs 2-stage brachiobasilic arteriovenous fistulas (BBAVF) accounting for individual surgeon practice patterns.

METHODS

Retrospective review of VQI patients who underwent BBAVF creation (2011-2022) with random effects model for surgeon.

Surgeon Practice Patterns

Surgeon 1: Majority 2-stage procedures

Surgeon 2: Majority 1-stage procedures

1° endpoint: BBAVF maturation
2° endpoint: 1-year reintervention-free fistula survival

CONCLUSIONS

2-stage BBAVFs had superior maturation and 1-year intervention-free fistula survival compared to 1-stage. Surgeon effects significantly impacted these findings.

RESULTS

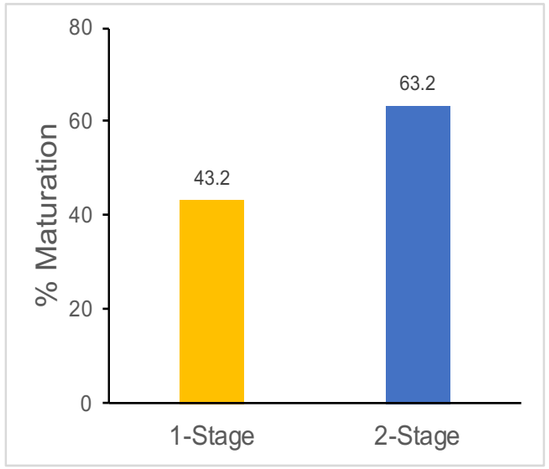

Figure 1. Maturation rates at last follow-up.

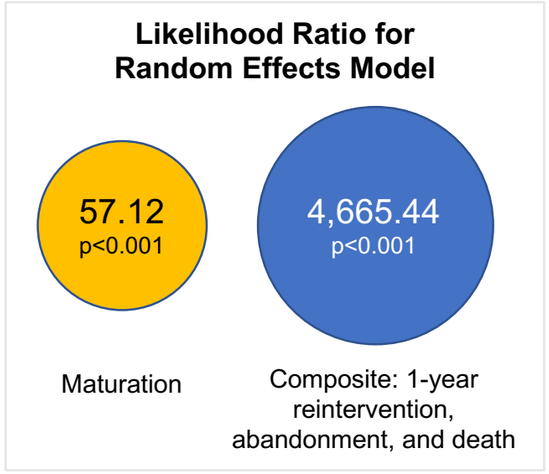

Figure 2. Random effects analysis.

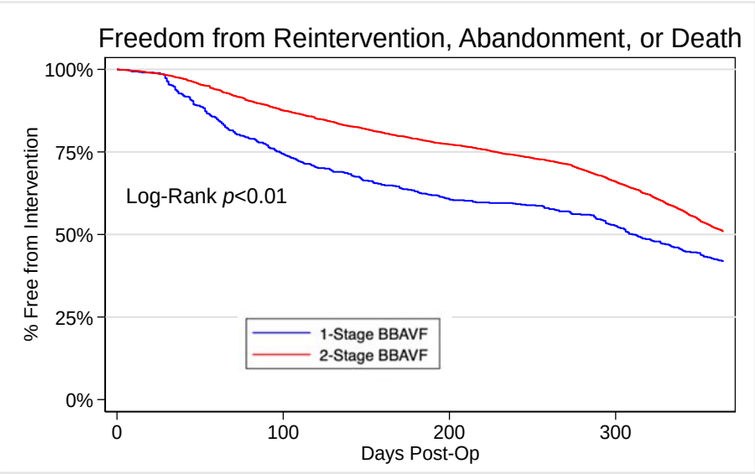

Figure 3. KM survival analysis of composite outcome.

Covariate	1-Stage	2-Stage	p
Age (years, mean ± SD)	62.1 ± 15.2	63.4 ± 14.5	**0.022**
Race			
White	340 (53.9%)	3085 (54%)	**0.039**
Black	206 (32.7%)	2033 (35.6%)	
Other	85 (13.5%)	593 (10.4%)	
Hispanic Ethnicity	63 (10.1%)	402 (7.1%)	**0.006**
ADI percentile			
1-20	111 (17.6%)	783 (13.8%)	**0.001**
21-40	137 (21.7%)	997 (17.6%)	
41-60	133 (21.1%)	1226 (21.6%)	
61-80	127 (20.1%)	1270 (22.4%)	
81-100	123 (19.5%)	1400 (24.7%)	
Follow-Up Days (mean ± SD)	296.7 ± 185.4	418.8 ± 249.5	**<0.001**
CAD	180 (28.4%)	1317 (23.1%)	**0.003**
PAD	32 (5.2%)	430 (7.6%)	**0.03**
Catheter Prior to Fistula	370 (58.4%)	2788 (48.8%)	**<0.001**
Preoperative Vein Imaging	557 (87.9%)	5184 (90.7%)	**0.020**

Table 1. Select demographics and comorbidities.

Covariate	OR	95% CI	p
2-Stage Procedure	2.3	1.9-2.9	**<0.001**
Age (years)	0.99	0.99-1.0	**<0.001**
Female sex	0.73	0.63-0.84	**<0.001**
Race (ref. white)			
Black	0.81	0.68-0.96	**0.014**
Other	1.1	0.89-1.5	0.278
ADI percentile (ref. 1-20)			
21-40	0.90	0.68-1.2	0.454
41-60	0.90	0.68-1.2	0.491
61-80	0.73	0.54-0.97	**0.033**
81-100	0.82	0.61-1.1	0.205
BMI (kg/m^2)	0.98	0.97-0.99	**0.002**
Diabetes (ref. none)			
Diet/Med controlled	1.2	0.96-1.4	0.114
Insulin-dependent	1.2	1.0-1.4	**0.030**
CKD stage ≤3 (ref. stage 4 or 5)	2.0	1.2-3.3	**0.007**
Vein Diameter (mm)	1.1	1.0-1.1	**0.020**

Table 2. Maturation logistic regression with surgeon effect.

DISCUSSION

- Social factors, comorbidities, and urgency for dialysis access may impact the decision for 1- vs 2-stage BBAVF
- Random effects improved model fit and supports maturation and intervention-free survival benefit of 2-stage procedures
- Biased towards VQI-reported outcomes
- Future directions:
  - Outcomes for primary, primary-assisted, and secondary patency
  - Randomized control trial