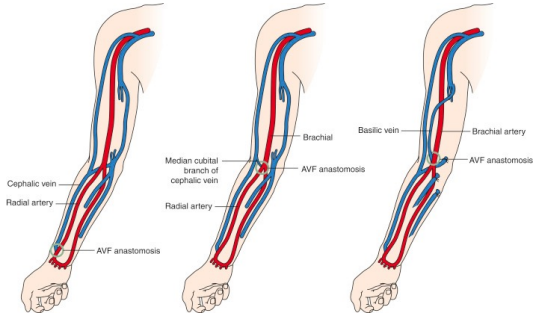
Long-Term Patency Between Brachiocephalic And Brachiobasilic Fistulas: A Single Institution Review

Rohini J. Patel, MD, MPH; Sina Zarrintan MD, MS, MPH, Claire Janssen MD, Sabrina Straus BS, Mahmoud B. Malas, MD, MHS; Omar Al-Nouri DO
Division of Vascular Surgery, University of California San Diego School of Medicine, San Diego, CA, USA

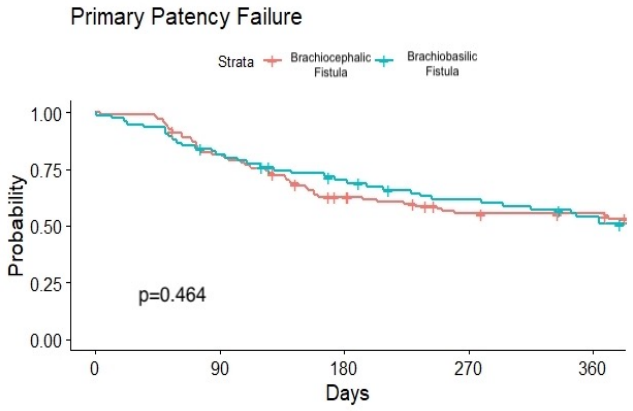
Background

- When forearm vessels are not suitable for AVF creation or when previous access attempts have failed, the options for vascular access move to the upper arm
- The basilic vein is a deeper vein, protected from venipuncture damage, and has a wide diameter which contributes to fistula maturation. However, the basilic vein must be mobilized and superficialized during fistula formation
- Cephalic vein is superficial making the surgical technique simpler but also increasing the risk of previous venipuncture damage.
- There is no consensus in the literature on which AV access produces better outcomes



Methods

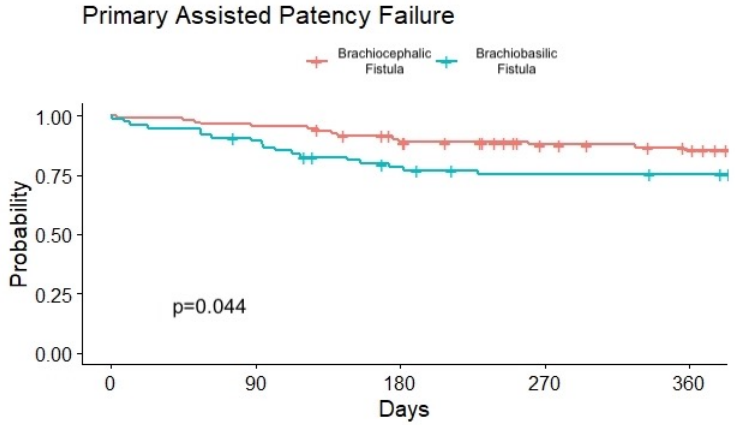
- Retrospective review
- 2019-2022
- Single institution
- Patients were split by procedure: BCF and BBF
- Primary outcomes
  - Primary patency (PP)
  - Primary assisted patency (PAP)
  - Secondary patency (SP)
- Secondary outcomes
  - 30-day complications
  - Access abandonment
  - Interventions
  - Mortality



Regression

	Coefficient*	95% CI	P Value	Adjusted R-Squared
Operative Time (minutes)	44.2	35.0,53.5	<0.0001	0.371
IVF (cc)	103.0	40.8,165.2	0.001	0.128
Estimated Blood Loss (cc)	23.0	13.1,32.9	<0.0001	0.268

Adjusted for age, sex, body mass index, smoking status, preoperative vein size, history of surgical access, procedure type (BCF vs BBF), and anesthesia type
Each model compares individuals who underwent a brachiocephalic fistula (BCF) compared to brachiobasilic fistula (BBF)
*Increase in covariate in BBF



Secondary Outcomes

Variable	Brachiobasilic Fistula N=75 (40.8)	Brachiocephalic fistula N=109 (59.2)	P-Value
30-Day Outcomes			
Hematoma			0.155
Non-Operative Management	4 (5.3)	2 (1.8)	
Operative Management	0	3 (2.8)	
Pseudoaneurysm	1 (1.3)	0	0.227
Embolus	0	0	n/a
Stroke	0	0	n/a
Myocardial Infarction	0	0	n/a
Infection	1 (1.3)	0	0. 227
Deep Venous Thrombosis	0	1 (0.9)	0.406
30-Day Death	0	0	n/a
Long-Term Outcomes			
Access Abandonment	25 (33.3)	28 (25.7)	0.261
Steal Syndrome	3 (4.0)	6 (5.5)	0.642
Time to Cannulation	136.4 ± 143.3	176.6 ± 168.8	0.109
Total # Interventions	1.1 ± 1.7	1.1 ± 1.8	0.868
Death	14 (18.7)	6 (5.5)	0.005

Conclusion

- No difference was seen between BBF and BCF in terms of primary patency or secondary patency
- Even with larger vein size, BBF did not confer a benefit in long term patency or access abandonment
- BBF did not confer decreased procedures to maintain patency and BBF had greater operative length and blood loss, as well as mortality
- We believe this study demonstrates that for patients who must use an upper extremity location, using the cephalic vein is preferred as it does not negatively impact long-term patency