

Hemodynamical changes after brachiobasilic arteriovenous fistulas in patients with and without previous ipsilateral vascular access

N. Zonnebeld, MD, M.M. van Loon, NP, PhD, J.H.M. Tordoir, MD, PhD
Biomedical Engineering | Vascular Surgery

niek.zonnebeld@mumc.nl

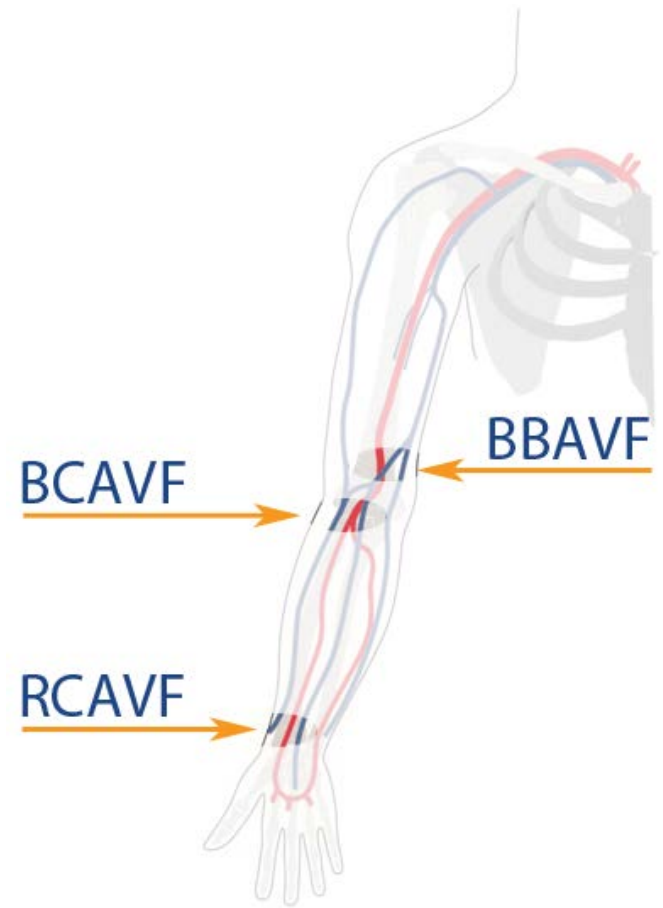
Introduction

AVF order of preference

1. Radiocephalic
2. Brachiocephalic
3. Brachiobasilic

Rationale for preference

- If matured, distally fewer complications
- Preserves proximal accesses



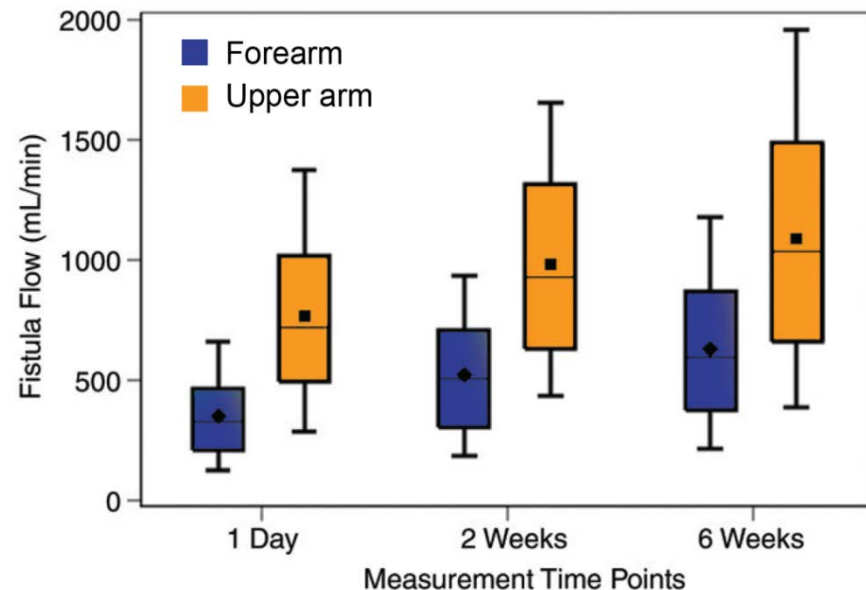
Higher fistula flow in upper arm AVFs

High-flow vascular access

- 1500-2000 mL/min

Associated with deleterious effects

- Increased cardiac burden
- Increased risk distal ischemia



Specific BBAVF information is scarce

Hemodynamical changes after BBAVF creation

- Often previous ipsilateral AVF
- 'Pre-'maturation?

Aim

- Assess natural flow development after BBAVF creation
- Compare BBAVFs with and without previous ipsilateral AVF

Materials and methods

Study design

- Retrospective chart review
- Tertiary referral center
- June 2009 – April 2016

Patient selection and Follow-up

- Brachiobasilic AVFs, completely autogenous
- Excluded patients with incomplete FU or any intervention before 6 weeks
- FU completed at 12 weeks, any intervention or loss to follow-up

Materials and methods

Duplex ultrasonography

- Routinely performed by trained vascular technicians
- Venous and arterial measurements halfway upperarm
- Time averaged mean velocity for flow determination

Procedure

- One-stage BBAVF with basilic vein transposition

Results: patient selection

92 patients received BBAVF, 17 excluded

	Previous VA	No previous VA	Unkown
Thrombosed	2	3	-
No follow-up	3	3	3
Banding	1	-	-
Graft interposition	2	-	-

Results: follow-up

75 patients analyzed, all completed 6 weeks, at 12 weeks:

	Previous VA	No previous VA
Thrombosed	-	1
Loss to follow-up	3	7
Banding	1	1
PTA	1	5
PTFE interposition	-	1

Results: patient characteristics

	Previous VA (n=27)	No previous VA (n=48)	
Age	61±13	63±15	NS
Male	9 (33%)	28 (58%)	NS
Left sided AVF	15 (56%)	36 (75%)	NS
Diabetes	7 (26%)	16 (33%)	NS
Hypertension	16 (60%)	31 (65%)	NS
Hypercholesterolemia	7 (26%)	20 (42%)	NS

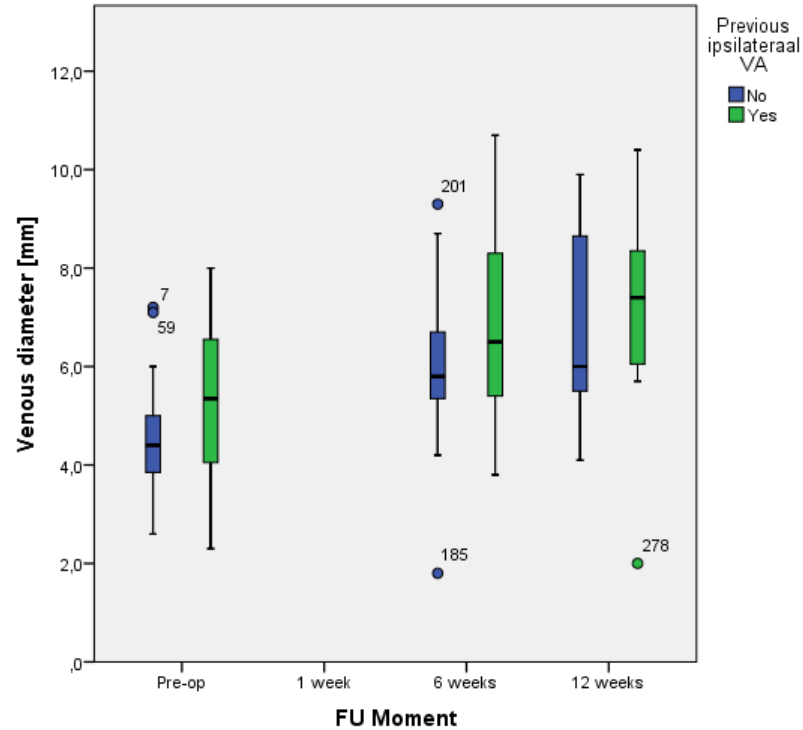
Results: previous vascular accesses

	Previous VA
RCAVF	13
BCAVF	5
Gracze	3
Forearm AVG	1
Multiple VAs	5
Total	27

Results: basilic vein diameters

	Previous VA	No previous VA	p-value
Pre-op	5.3±1.5	4.5±1.0	0.015
1 week	-	-	-
6 weeks	6.8±2.1	5.9±1.4	NS
12 weeks	7.1±2.3	6.8±1.9	NS

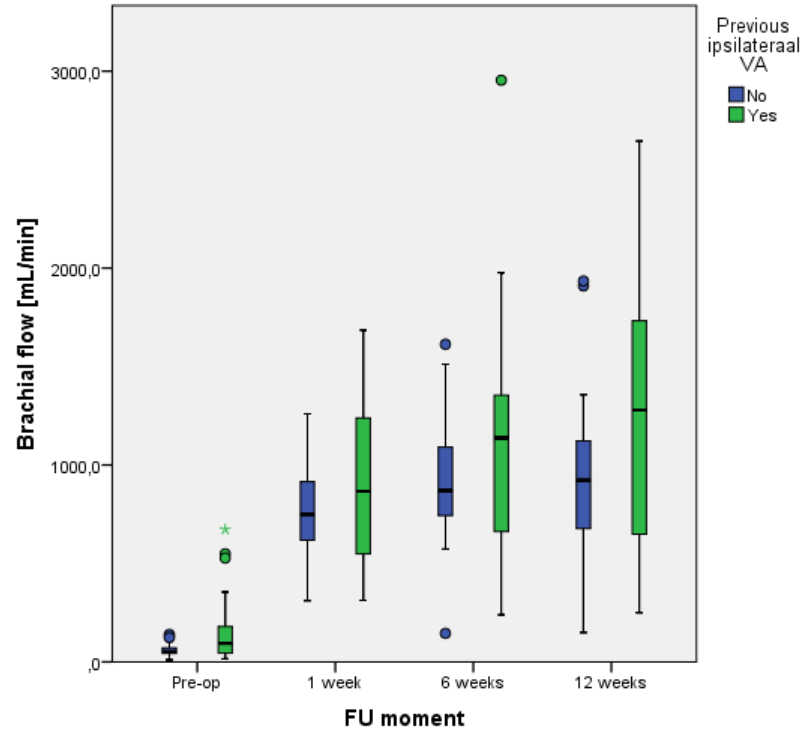
Results: basilic vein diameters



Results: brachial artery flow

	Previous VA	No previous VA	p-value
Pre-op	160±183	58±27	0.012
1 week	920±505	779±230	NS
6 weeks	1098±591	931±296	NS
12 weeks	1315±770	931±397	NS

Results: brachial artery flow



Conclusion

Previous ipsilateral VAs are associated with 'pre-'maturation

- Greater venous diameters and brachial volume flow

Preoperative differences disappeared after BBAVF creation

- Adequate vessel adaptation in both
- Previous ipsilateral VAs show wider ranges

Discussion

Strength

- Unique set on hemodynamical changes after BBAVF creation
- Intervention free, natural flow development

Limitation

- No clinical outcomes on high flow complications

Hemodynamical changes after brachiobasilic arteriovenous fistulas in patients with and without previous ipsilateral vascular access

N. Zonnebeld, MD, M.M. van Loon, NP, PhD, J.H.M. Tordoir, MD, PhD
Biomedical Engineering | Vascular Surgery

niek.zonnebeld@mumc.nl

**We invite you to
Rotterdam, The Netherlands**

11-13 April 2019



**11TH CONGRESS OF
THE VASCULAR
ACCESS SOCIETY**
11-13 APRIL 2019, DE DOELEN ICC
ROTTERDAM, THE NETHERLANDS
SAVE THE DATE