

Results of *first stage*
brachiobasilic
and brachio brachial
fistula creation:
Implications for single
versus two-stage procedure



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Disclosure

Speaker name: **Mary Ottinger MD**

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- I have the following potential conflicts of interest to report:
- Consulting
- Employment in industry
- Shareholder in a healthcare company
- Owner of a healthcare company
- Other(s)
- I do not have any potential conflict of interest**

Results of First Stage Fistula Creation:

BACKGROUND: Transposed AVF

- **Basilic (and increasingly brachial) vein fistulas are the next step if cephalic vein is not usable**
- **Even the basilic vein is “deep;” both require superficial transposition to be usable.**
- **Basilic vein transposition has traditionally been done in one operation, but increasingly a two-stage process has been suggested as better.**

Results of First Stage Fistula Creation: SINGLE STAGE BBTx RESULTS

Basilic vein transposition fistula: A good option for maintaining hemodialysis access site options?

Rajeev K. Rao, MD, G. Darius Azin, MD, Douglas B. Hood, MD, Vincent L. Rowe, MD, Roy D. Kohl, MD, Steven G. Katz, MD, and Fred A. Weaver, MD, *Los Angeles, Calif*

A Large-Scale Study of the Upper Arm Basilic Transposition for Hemodialysis

Carolyn Glass, John Porter, Michael Singh, David Gillespie, Kate Young, and Karl Illig, Rochester, New York

Results of First Stage Fistula Creation: SINGLE STAGE BBTx RESULTS:

Study	<i>n</i>	Primary patency (1 year)	Assisted/ secondary patency (1 year)	Maturation rate	Mean flow (mL/minute)	Mean vein diameter (mm)	Mean follow-up (months)
Rivers et al. ¹⁰	65	NR	58%	95%	NR	NR	30
Hossny et al. ¹¹	70	80%	87%	NR	NR	NR	26
Taghizadeh et al. ¹²	75	NR	66%	NR	NR	NR	14
Rao et al. ¹³	56	35%	47%	62%	NR	NR	NR
El Sayed et al. ¹⁵	170	52%	58%	NR	NR	NR	15
Yilmaz et al. ¹⁶	42	71%	88%	86%	NR	NR	21
Karakayali et al. ¹⁷	51	72%	92%	98%	272	4.1	NR
Woo et al. ¹⁸	119	71%	76%	NR	NR	4.4	28
Chemla and Morsy ¹⁹	34	73%	93%	NR	NR	>3.0	24
Kakkos et al. ²⁰	41	NR	87%	NR	NR	NR	NR
Casey et al. ²¹	42	50%	50%	74%	NR	4.9	8
Harper et al. ²²	168	59%	66%	66%	NR	NR	16
Current study	217	40%	72%	87%	347	NR	9
Mean		58.6%	72%	80.0%			

Glass et al. Ann Vasc Surg 2010; 24: 85-91

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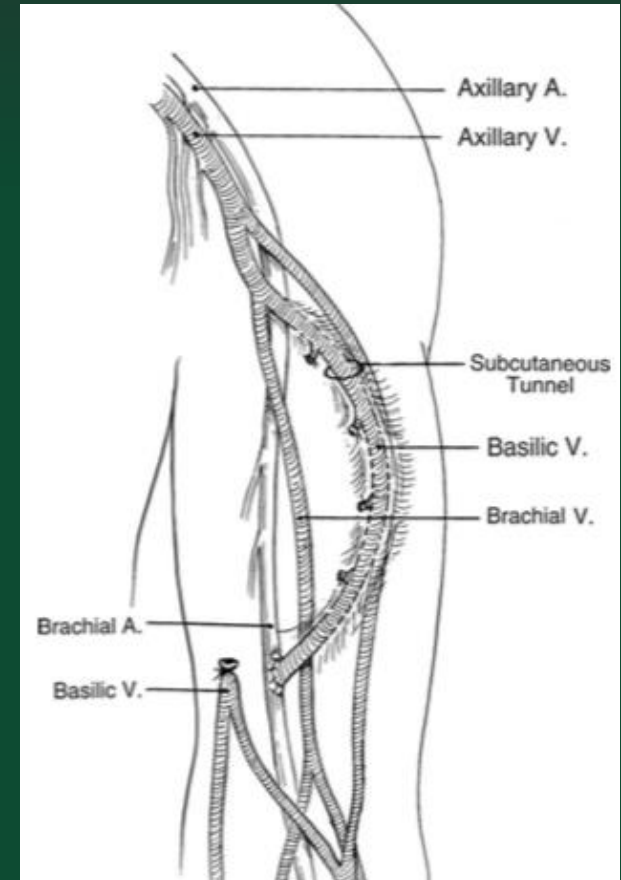
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**Benchmark:
80-87%**

Glass et al. Ann Vasc Surg 2010; 24: 85-91

Results of First Stage Fistula Creation: Transposed AVF

- Single stage
 - “Big operation”
- Two stage
 - Need for two operations
 - More potential morbidity
 - Higher cost
 - Longer time to first use
 - Longer time to catheter removal



Results of First Stage Fistula Creation: THE ISSUE WITH TWO STAGES:

$$\begin{aligned} &\text{OVERALL maturation} = \\ &\text{FIRST stage maturation} \\ &\quad \times \\ &\text{SECOND stage maturation} \end{aligned}$$

Results of First Stage Fistula Creation: THE ISSUE WITH TWO STAGES:

- **Each** operation 90% maturation rate?
 - The **overall** maturation rate of the fistula is 81%

Results of First Stage Fistula Creation: TWO STAGE BBTx RESULTS

A comparison of the outcomes of one-stage and two-stage brachiobasilic arteriovenous fistulas

Georgios Vrakas, MD, MSc,^{a,b} Fatima Defigueiredo,^a Sam Turner, MBBS, MRCS,^{a,b} Chris Jones, PhD,^a John Taylor, MBBS, FRCS,^{a,b} and Francis Calder, MB, FRCS,^{a,b} *London, United Kingdom*

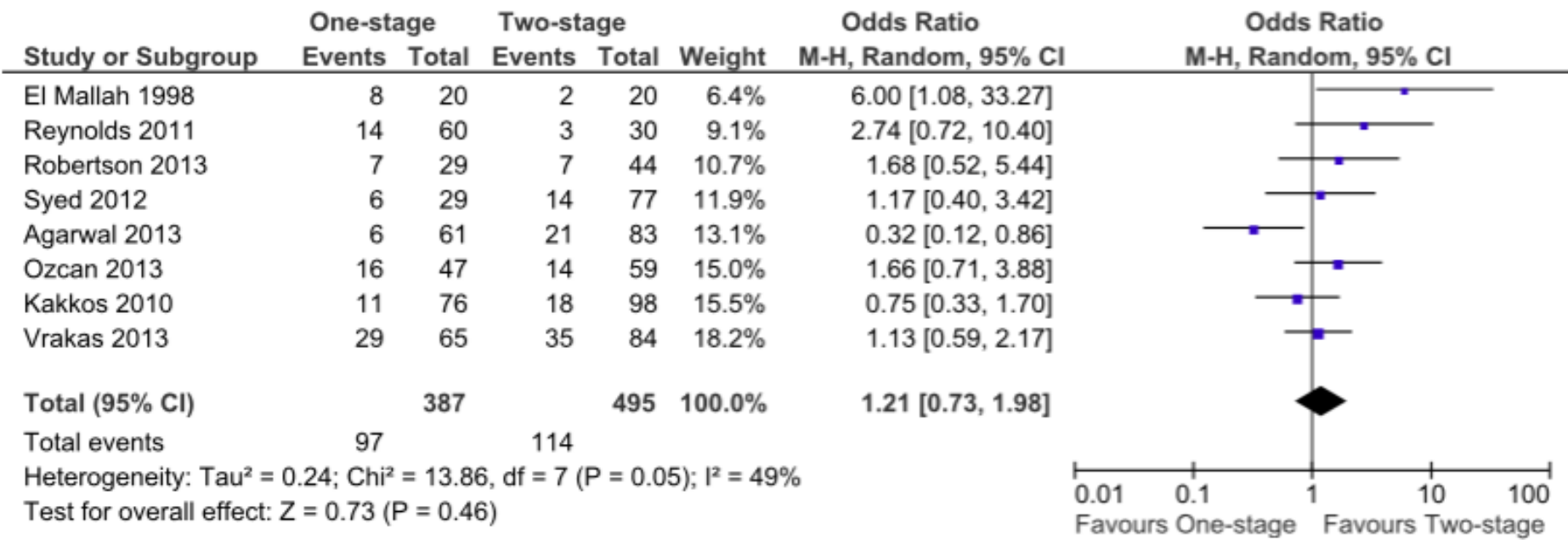
Comparison of Outcomes of One-Stage Basilic Vein Transpositions and Two-Stage Basilic Vein Transpositions

Fahad A. Syed, Christopher J. Smolock, Cassidy Duran, Javier E. Anaya-Ayala, Joseph J. Naoum, Tam T. Hyunh, Eric K. Peden, and Mark G. Davies, Houston, Texas

A comparison between one- and two-stage brachiobasilic arteriovenous fistulas

Tyler S. Reynolds, MD,^a Mohamed Zayed, MD, PhD,^c Karen M. Kim, MD,^a Jason T. Lee, MD,^c Brandon Ishaque, BA,^a Ramanath B. Dukkipati, MD,^{b,d} Amy H. Kaji, MD, PhD,^c and Christian de Virgilio, MD,^{a,d} *Torrance, Calif*

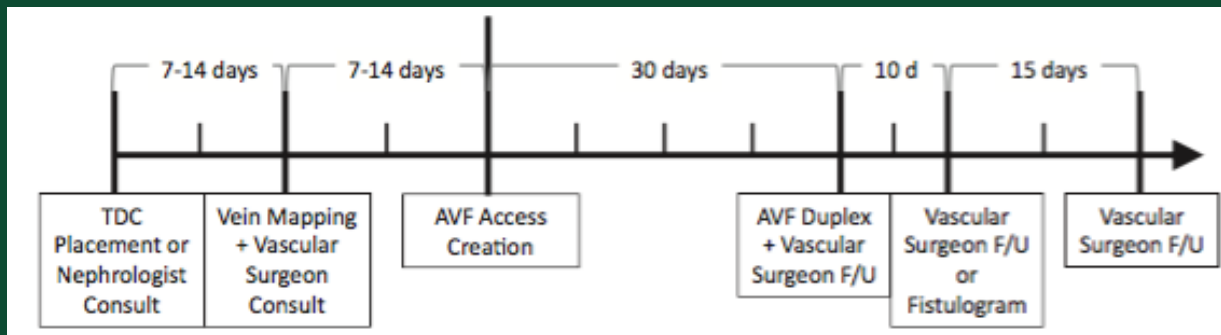
Results of First Stage Fistula Creation: RETROSPECTIVE ANALYSES:



Cooper et al. J Vasc Surg 2015;61:809-816

Results of First Stage Fistula Creation: PATIENT FOLLOW UP

- Compliance
- Access to care
- Adherence to follow-up visits
 - 48% first appointment (post-op)
 - 23% second appointment (clearance for use)



¹Lynch et al. J Vasc Surg 2015;61:184-91

Results of First Stage Fistula Creation: PURPOSE OF THIS STUDY:

OVERALL maturation=

FIRST stage maturation X SECOND stage maturation

- **This study is designed to measure the first term of this equation.**

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Results of First Stage Fistula Creation: PURPOSE OF THIS STUDY:

OVERALL maturation=

FIRST stage maturation X SECOND stage maturation

- This study is designed to define the maturation rate for the first stage fistula.

Results of First Stage Fistula Creation:

METHODS:

- **Retrospective review, prospective database**
 - **October 2012 to November 2015**

- **All patients undergoing staged upper arm “deep” vein fistula creation**
 - **Brachio-basilic (Br-Bas)**
 - **Brachio-brachial (Br-Br)**

Results of First Stage Fistula Creation:

METHODS:

- **Maturation of FIRST stage:**
 - Clinically patent after first stage
 - Completion of second stage

- **Failure:**
 - Failure to mature
 - Non-patent or unusable at second stage
 - Lost to follow-up

Results of First Stage Fistula Creation:

RESULTS:

	N	Failure after Stage 1	Lost to follow up	Unusable at Stage 2	Completed Stage 2
Br-Bas	40	3 (7.5%)	5 (12.5%)	1	31 (78%)
Br-Br	23	2 (8%)	1 (4%)	0	20 (87%)
TOTAL	63	5 (8%)	6 (9.5%)	1	51 (81%)

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RESULTS: Overall Results

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P~0.99

Results of First Stage Fistula Creation:

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- 80% of first stage procedures matured
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Results of First Stage Fistula Creation: INTERPRETATION

- 80% of first stage procedures matured
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- *10% of patients were lost to follow-up*
- If all those lost to follow-up actually matured, already no better than 90% after the first stage – little room for error during the second stage to meet the 80-87% benchmark

Results of First Stage Fistula Creation: INTERPRETATION

- 80% of first stage procedures matured
- 10% of first stage procedures failed
- *10% of patients were lost to follow-up*
- If all those lost to follow-up actually failed, even perfection at the second stage yields an overall maturation that will be *less* than the 80-87% benchmark

Results of First Stage Fistula Creation:

CONCLUSIONS

- **First stage maturation rates were approximately 80% (and equivalent) for brachio-brachial and brachio-basilic fistulas**
- **However, 10% of patients were lost to follow-up between stages**
- **Very little margin for error at the second stage to achieve the 80-87% success rates reported for the single stage procedure**

Results of First Stage Fistula Creation:

CONCLUSIONS

- A prospective, randomized trial is necessary to confirm the superiority of the single or staged fistula creation
- *All* patients who initiate staged procedures *must* be included when interpreting the success of staged fistula creation

