Transposed Brachiobasilic AVF
vs
Upper arm ePTFE AVG

PRO TBBAVF

Lecturer: Torbjörn Fransson, Consultant Vascular Surgeon, Vascular Centre, Skåne University Hospital
Venue: Swedish Access Meeting 13-14 Nov, 2025, Stockholm, Sweden

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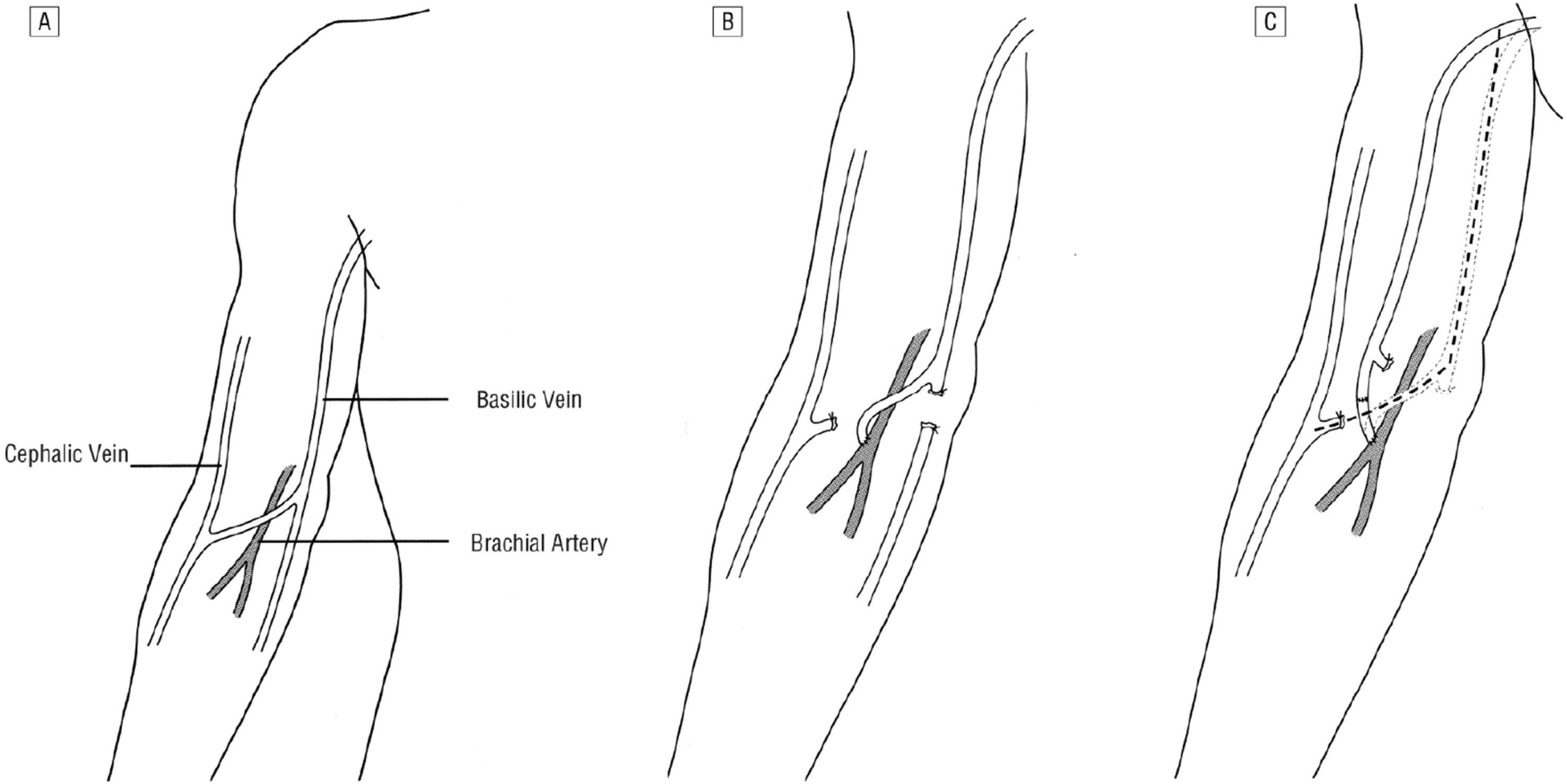

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Eur J Vasc Endovasc Surg (2018) 55, 757–818

Editor's Choice — Vascular Access: 2018 Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS)☆

Jürg Schmidli [a,*], Matthias K. Widmer [a], Carlo Basile [a], Gianmarco de Donato [a], Maurizio Gallieni [a], Christopher P. Gibbons [a], Patrick Haage [a], George Hamilton [a], Ulf Hedin [a], Lars Kamper [a], Miltos K. Lazarides [a], Ben Lindsey [a], Gaspar Mestres [a], Marisa Pegoraro [a], Joy Roy [a], Carlo Setacci [a], David Shemesh [a], Jan H.M. Tordoir [a], Magda van Loon [a],

ESVS Guidelines Committee [b], Philippe Kolh, Gert J. de Borst, Nabil Chakfe, Sebastian Debus, Rob Hinchliffe, Stavros Kakkos, Igor Koncar, Jes Lindholt, Ross Naylor, Melina Vega de Ceniga, Frank Vermassen, Fabio Verzini,

ESVS Guidelines Reviewers [c], Markus Mohaupt, Jean-Baptiste Ricco, Ramon Roca-Tey

Keywords: Guideline, Arteriovenous access, Vascular acc
insufficiency, Haemodialysis, Surveillance, Co

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☆ The ESVS guidelines for Vascular Access are endorsed by the Vascular Ac

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https://doi.org/10.1016/j.ejvs.2018.02.001

KDOQI
KIDNEY DISEASE OUTCOMES QUALITY INITIATIVE
National Kidney Foundation

KDOQI CLINICAL PRACTICE GUIDELINE FOR VASCULAR ACCESS: 2019 UPDATE

*Charmaine E. Lok, Thomas S. Huber, Timmy L
Michael Allon, Arif Asif, Brad C. Astor, Marc H.
Cynthia Roberts, Tushar J.*

The National Kidney Foundation's Kidney Disease
based guidelines for hemodialysis vascular access
great accumulation of new evidence and sophistica
Clinical Practice Guideline for Vascular Access is
practitioners care for chronic kidney disease patien
kidney disease "Life-Plan" and related concepts, gu
access (fistulas and grafts) and central venous ca
approaches to some older topics. Appraisal of the
Grading of Recommendations Assessment, Develo
and application followed the GRADE Evidence to D
accompanied by rationale/background informatio
implementation considerations, special discussion

In citing this document, the following format shou
Access Guideline Work Group. KDOQI clinical
Kidney Dis. 2020;75(4)(suppl 2):S1-S164.

As they are designed to reflect the views and rec
on data from an independent evidence review tea
KDOQI guidelines are not peer reviewed by *AJ*

REVIEW Open Access

UK Kidney Association Clinical Practice Guideline on vascular access for haemodialysis

Emma Aitken[1], Hameed Anijeet[2], Damien Ashby[3*†], Wayne Barrow[4], Francis Calder[5], Brett Dowds[4], Catherine Fielding[6†], James Gilbert[7], Rob Jones[8], Narayan Karunanithy[5], Zaib Khawaja[8], Emma Roberts[9], Mike Robson[5,12], Rukshana Shroff[10], Hannah Stacey[11], Peter Thomson[1] and Dan Waters[4]

Abstract This guideline is written primarily for doctors and nurses working in dialysis centres and related areas of medicine in the UK, and is an update of a previous version written in 2015. It aims to provide guidance on how to provide vascular access care for patients approaching and undergoing haemodialysis, and provides a standard of care which centres should in general aim to achieve. We would not advise patients to interpret the guideline as a rulebook, but perhaps to answer the question: "What does good quality vascular access care look like?". The guideline is split into sections: each begins with a few statements which are graded by strength (1 is a firm recommendation, 2 is more like a sensible suggestion), and the type of research available to back up the statement, ranging from A (good quality trials so we are pretty sure this is right) to D (more like the opinion of experts than known for sure). After the statements there is a short summary explaining why we think this, often including a discussion of some of the most helpful research. There is then a list of the most important medical articles so that you can read further if you want to – most of this is freely available online, at least in summary form.

A few notes on the individual sections:

1. This section covers key concepts relevant to vascular access and focusses on access type selection, including a historical introduction and review of the key literature informing our understanding. This explains why we are moving away from the outdated advice in previous guidelines (e.g. that 'all patients should dialyse with a fistula as first choice') towards a process which treats dialysis access selection as a choice, respecting patient individuality, aiming to provide high quality assessment and advice, so that patients are supported in making informed decisions. The basic concept of the fistula as optimal access is highlighted and remains valid, but it is placed within a more modern concept of care, in which the patient is at the centre of the decision process.

Guidlines advice us about the advantages with autologous AVF

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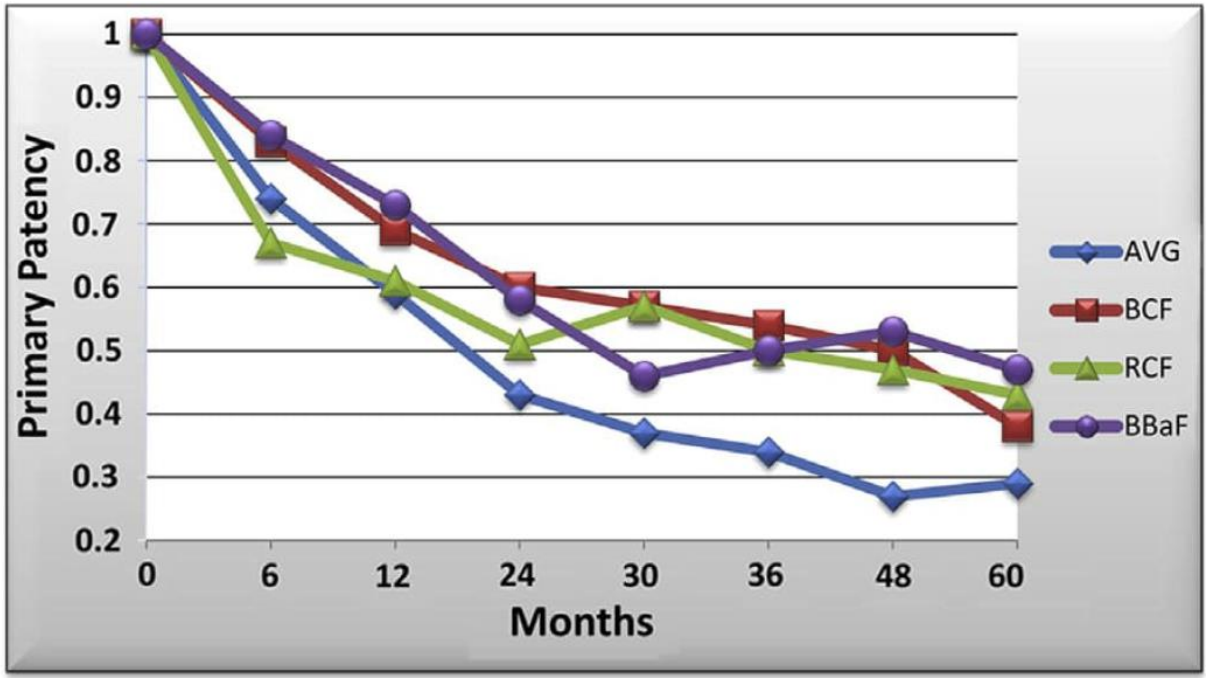
Patency of autogenous and polytetrafluoroethylene upper extremity arteriovenous hemodialysis accesses: A systematic review

Thomas S. Huber, MD, PhD,[a] Jeffrey W. Carter, BS,[b] Randy L. Carter, PhD,[b] and James M. Seeger, MD,[a] *Gainesville, Fla*

Objective: Patency rates for autogenous accesses are presumed to be better than for polytetrafluoroethylene (PTFE) accesses, although the strength of the supporting evidence is limited. We undertook this study to test the hypothesis that patency rates for upper extremity autogenous hemodialysis arteriovenous accesses in adults are superior to those for PTFE counterparts.
Methods: A systematic review of relevant literature and meta-analysis of the patency data were performed. Studies were considered acceptable if patency data were reported by either life table or Kaplan-Meier method, including number of patients at risk.
Results: The thirty-four studies that satisfied the inclusion criteria were composed predominantly of case series or nonrandomized controlled studies; no randomized, controlled studies comparing autogenous and PTFE accesses were included. The primary patency rate for autogenous accesses was 72% (95% confidence interval [CI], 70%-74%) at 6 months and 51% (95% CI, 48%-53%) at 18 months, and the corresponding primary patency rate for PTFE accesses was 58% (95% CI, 56%-61%) and 33% (95% CI, 31%-36%), respectively. The secondary patency rate for autogenous accesses was 86% (95% CI, 84%-88%) at 6 months and 77% (95% CI, 74%-79%) at 18 months, and the corresponding secondary patency rate for PTFE accesses was 76% (95% CI, 73%-79%) and 55% (95% CI, 51%-59%), respectively.
Conclusions: The patency rate for autogenous upper extremity arteriovenous hemodialysis accesses in adults is superior to that for PTFE counterparts, although the overall quality of the studies in the meta-analysis was less than ideal. Randomized, controlled studies to further examine the differences in outcome between these two access types are necessary. (J Vasc Surg 2003;38:1005-11.)



Outcomes of vascular access for hemodialysis: A systematic review and meta-analysis

Jehad Almasri, MD,[a] Mouaz Alsawas, MD,[a] Maria Mainou, MD,[b] Reem A. Mustafa, MD, FACP, MPH, PhD,[c] Zhen Wang, PhD,[a] Karen Woo, MD,[d] David L. Cull, MD,[e] and M. Hassan Murad, MD, MPH,[a] *Rochester, Minn; Thessaloniki, Greece; Kansas City, Mo; Los Angeles, Calif; and Greenville, SC*

Background: The decision about the type and location of a hemodialysis vascular access is challenging and can be affected by multiple factors. We explored the effect of several a priori chosen patient characteristics on access outcomes.
Methods: We searched MEDLINE, Embase, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, and Scopus through November 13, 2014. We included studies that evaluated patency, mortality, access infection, and maturation of vascular access in adults requiring long-term dialysis. Pairs of reviewers working independently selected the studies and extracted the data. Outcomes were pooled across studies using the random-effects model.
Results: Two hundred studies met the eligibility criteria reporting on 875,269 vascular accesses. Overall, studies appeared to have provided incidence rates at low to moderate risk of bias. The overall primary patency at 2 years was higher for fistulas than for grafts and catheters (55%, 40%, and 50%, respectively). Patency was lower in individuals with diabetes, coronary artery disease, older individuals, and in women. Mortality at 2 years was highest with catheters, followed by grafts then fistulas (26%, 17%, and 15%, respectively).
Conclusions: The current evidence remains in support of autogenous access as the best approach when feasible. We provide incidence rates in various subgroups to inform shared decision making and facilitate the conversation with patients about access planning. (J Vasc Surg 2016;64:236-43.)

Autologous access is a better choice

Proximal location have better outcome

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REVIEW

Arteriovenous Fistulae for Haemodialysis: A Systematic Review and Meta-analysis of Efficacy and Safety Outcomes

L.C. Bylsma [a], S.M. Gage [b,c], H. Reichert [a], S.L.M. Dahl [b,c], J.H. Lawson [b,c,*]

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WHAT THIS PAPER ADDS

This systematic review and meta-analysis summarizes arteriovenous fistula patency, maturation, infection, and abandonment. Fistulae were characterized by low rates of infection but also high risk of abandonment and failure to mature, which should be taken into consideration when selecting a vascular access modality.

Background: Arteriovenous fistulae are the currently recommended gold standard vascular access modality for haemodialysis because of their prolonged patency, improved durability, and low risk of infection for those that mature. However, notable disadvantages are observed in terms of protracted maturation time, associated high rates of catheter use, and substantial abandonment rates. The aim of this study was to quantitatively summarize the outcomes of fistula patency, infection, maturation, and abandonment published in the scientific literature.

Methods: This was a systematic review and meta-analyses of studies evaluating fistula outcomes. Literature searches were conducted in multiple databases to identify observational and interventional studies of mean fistula patency rates at 1 year, infection risk, maturation time, and abandonment. Digitisation software was used to simulate individual patient level data from Kaplan–Meier survival plots.

Results: Over 8000 studies were reviewed, and from these, 318 studies were included comprising 62,712 accesses. For fistulas the primary unassisted, primary assisted, and secondary patency rates at one year were 64%, 73% and 79% respectively, however not all fistulas reported as patent could be confirmed as being clinically useful for dialysis (i.e. functional patency). For fistulas that were reported as mature, mean time to maturation was 3.5 months, however only 26% of created fistulas were reported as mature at 6 months and 21% of fistulas were abandoned without use. Overall risk of infection in fistula patients was 4.1% and the overall rate per 100 access days was 0.018.

Conclusions: Reported fistula patency rates may overstate their potential clinical utility when time to maturation, maturation rate, abandonment and infection are considered. Protracted maturation times, abandonment and infection all have a significant impact on evaluating the clinical utility of fistula creation. A rigorous and consistent set of outcomes definitions for hemodialysis access are necessary to clarify factors contributing to fistula success and the clinical consequence of fistula failure.

Article history: Received 30 March 2017, Accepted 27 June 2017, Available online 23 August 2017
Keywords: Arteriovenous fistula, Haemodialysis, Patency, Maturation, Meta-analysis

BBAVF:
(n=1250)

- 1y pp 55%
- 1y sp 75%

Similar to RC/BC AVF

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Meta-analysis of total versus partial graft excision: Which is the better choice to manage arteriovenous dialysis graft infection?

Thawatchai Tullavardhana, Anuwat Chartkitchareon

From the Department of Surgery, Faculty of Medicine, Ongkharak Campus, Srinakharinwirot University, Ongkaharak, Nakhon Nayok, Thailand

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Citation: Tullavardhana T, Chartkitchareon A. Meta-analysis of total versus partial graft excision: Which is the better choice to manage arteriovenous dialysis graft infection? Ann Saudi Med 42(5): 343-350. DOI: 10.5144/0256-4947.2022.343

Received: April 24, 2022

Accepted: July 3, 2022

Published: October 6, 2022

Funding: Srinakharinwirot University

BACKGROUND: Arteriovenous graft infection (AVGI) is a major cause of hemodialysis access failure. Delayed diagnosis and inappropriate treatment may lead to increased morbidity (3-35%) and mortality up to 12%.

OBJECTIVES: Compare the postoperative outcomes of total graft excision (TGE) and partial graft excision (PGE) in the treatment of AVGI.

DESIGNS: Systematic review and meta-analysis

METHODS: The dataset was defined by searching PubMed, EMBASE, Google Scholar, and the Cochrane database for articles outlining the terms arteriovenous graft infection, infected dialysis graft, TGE and PGE published between 1995-2020. The data analysis evaluated the outcomes of TGE and PGE in the management of AVGI. The meta-analysis was performed using Review Manager Software version 5.4.1.

MAIN OUTCOME MEASURES: 30-day mortality, recurrent infection, and reoperation rate.

SAMPLE SIZE: Eight studies, including 555 AVGI, and 528 patients.

RESULTS: PGE showed a significant increase in recurrent graft infection rate (OR=0.23,95% CI=0.13–0.41, *P*<.00001) and re-operation rate for control of infection (OR=0.14,95% CI=0.03–0.58, *P*<.007). However, the 30-day mortality rate did not differ significantly between the groups (OR=0.92,95% CI=0.39–2.17, *P*=.85).

CONCLUSIONS: TGE remains a safe and effective surgical method for the management of AVGI. PGE is associated with a higher risk of graft infection and need for re-operation. As a result, PGE should only be considered in carefully selected patients.

LIMITATION: Risk of bias due to the differences in patient characteristics.

CONFLICT OF INTEREST: None.

Incidens of infections:

Autologous AVF 0.5-5%

AVG as high as 20-35%

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EDITORIAL COMMENT: Expert Article Analysis for:
Editorial for: Outcomes after endovascular mechanical thrombectomy in occluded vascular access used for dialysis purposes

Outcomes after endovascular mechanical thrombectomy in occluded vascular access used for dialysis purposes

Johannes W. Drouven MD[1] | Cor de Bruin[1] | Arie M. van Roon PhD[2] | Job Oldenziel MD[3] | Reinoud P. H. Bokkers MD, PhD[3] | Clark J. Zeebregts MD, PhD[1]

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Abstract

Purpose: Endovascular mechanical thrombectomy using the AngioJet™ system can be considered to reestablish patency in occluded vascular access. The aim of this study was to review our results for endovascular mechanical thrombectomy using the AngioJet™ system in patients with arteriovenous fistulae (AVF) and arteriovenous grafts (AVG).

Methods: Data collected in a database of patients requiring hemodialysis for renal failure were analyzed. Patients who underwent endovascular mechanical thrombectomy procedures with the AngioJet™ system for occlusion of vascular access were included. Clinical and technical success rates and patency rates were calculated. Multivariate analysis was used to identify factors of influence.

Results: A total of 92 AngioJet™ procedures in 60 patients with thrombosed vascular access were reviewed during a mean follow-up period of 21.5 months in patients with an AVF and 11.9 months in patients with an AVG. Technical and clinical success was achieved in 92.6% of AVF cases and 92.0 and 90.8% of AVG cases with an AVG, respectively. Significantly higher primary and primary-assisted patency rates were observed in the AVF group. Multivariate regression analysis indicated that left-sided vascular access and female sex were independent predictors for failure regarding primary patency in AVG patients. Immunosuppressive drugs and older age were negative predictors for secondary patency in AVG patients.

Conclusions: The AngioJet™ system can be deemed an effective technique to reestablish patency in occluded vascular access with minimal use of central venous catheters for dialysis. Good technical and clinical success rates were achieved with acceptable patency rates, especially in AVF patients.

KEYWORDS
endovascular, outcomes, thrombectomy, vascular access

Outcomes of endovascular salvage of clotted arteriovenous access and predictors of patency after thrombectomy

Check for updates

Ru Yu Tan, MBBS,[a] Suh Chien Pang, MBBS,[a] Swee Ping Teh, MBBS,[a] Chee Yong Ng, MBBS,[a] Kian Guan Lee, MBBS,[a] Marjorie Wai Yin Foo, MB ChB,[a] Apoorva Gogna, MBBS,[b] Tze Tec Chong, MBBS,[c] *and* Chieh Suai Tan, MBBS,[a] *Singapore*

ABSTRACT

Objective: This study aimed to report the outcomes of endovascular salvage of clotted arteriovenous (AV) accesses and to determine potential predictors of poor patency rates after thrombectomy.

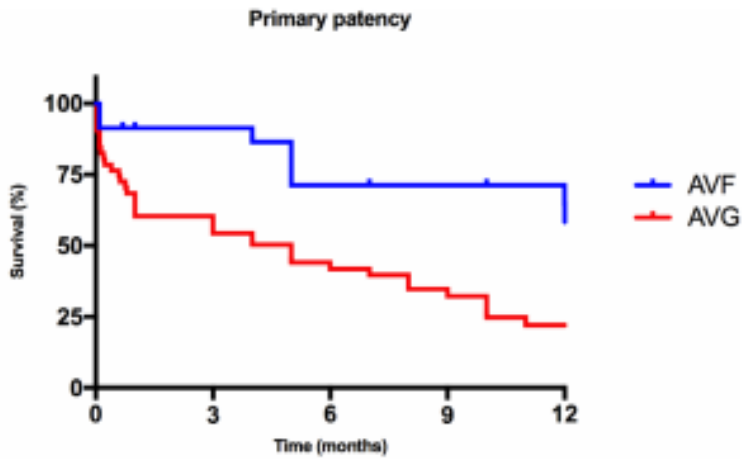
Methods: Records of hemodialysis patients who underwent endovascular salvage of clotted AV access were reviewed retrospectively. Technical and clinical success rates, complication rates, and 3- and 6-month patency rates were determined. Multivariate analysis was performed to determine the predictors of patency after thrombectomy.

Results: A total of 294 patients underwent endovascular salvage of clotted AV access during the study period: 156 patients had arteriovenous fistula, whereas the remaining 138 were arteriovenous grafts (AVGs). The technical and clinical success rates were 96.3% and 93.2%; the major and minor complication rates were 0.7% and 9.9%. Post-thrombectomy primary, assisted primary, and secondary patency rates were 62.9%, 76.2%, and 77.6% at 3 months and 43.9%, 59.5%, and 61.6% at 6 months. The patency rates were significantly better for arteriovenous fistula than for AVG except for 6-month assisted primary and secondary patency. Multivariate Cox regression analysis showed that prior thrombosis within 90 days was significantly associated with loss of primary patency (hazard ratio [HR], 1.90; 95% confidence interval [CI], 1.21-2.98; $P < .01$), assisted primary patency (HR, 2.42; 95% CI, 1.42-4.13; $P < .01$), and secondary patency (HR, 2.52; 95% CI, 1.40-4.53; $P < .01$). Having an AVG was also negatively associated with primary patency.

Conclusions: Most clotted AV accesses can be salvaged by endovascular technique. Recurrent thrombosis within 90 days is associated with poor short- and long-term patency even after successful endovascular reinterventions. (J Vasc Surg 2020;71:1333-9.)

Keywords: Endovascular technique; Arteriovenous fistula; Arteriovenous graft; Mechanical thrombolysis; Vascular patency

Results after endovascular trombectomy is superior for AVF



Numbers at risk					
AVF	27	19 (0.08)	14 (0.098)	12 (0.098)	11 (0.098)
AVG	65	28 (0.064)	19 (0.063)	13 (0,060)	7 (0.055)

FIGURE 1 Primary patency rates of AVF and AVG after AngioJet™ procedure. AVF, arteriovenous fistula; AVG, arteriovenous graft [Color figure can be viewed at wileyonlinelibrary.com]

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Characterization of long-term survival in Medicare patients undergoing arteriovenous hemodialysis access

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ABSTRACT

Background: Patients undergoing arteriovenous (AV) access creation for hemodialysis often have significant comorbidities. Our goal was to quantify the long-term survival and associated risks factors for long-term mortality in these patients to aid in optimization of goals and expectations.

Methods: The Vascular Implant Surveillance and Interventional Outcomes Network Vascular Quality Initiative Medicare linked data was used to assess long-term survival in the HD registry. Demographics, comorbidities, and interventions were recorded. Because the majority of hemodialysis patients are provided Medicare, Medicare linkage was used to obtain survival data. Multivariable analysis was used to identify independent associations with mortality.

Results: There were 13,945 AV access patients analyzed including 10,872 (78%) AV fistulas and 3073 (22%) AV grafts. The median age was 67 years and 56% of patients were male. Approximately one-third had a prior AV access and 44.7% had prior tunneled dialysis catheters. Patients receiving an AV fistula, compared with AV grafts, were more often younger, male, White, obese, independently ambulatory, preoperatively living at home, and less often have a prior AV access and tunneled dialysis catheters ($P < .05$ for all). The 5-year mortality overall was 62.9% with 61.2% for AV fistulas and 68.8% for AV grafts ($P < .001$). On multivariable analysis for 5 year mortality, nonambulatory status (hazard ratio [HR], 1.67; 95% confidence interval [CI], 1.53-1.83; $P < .001$), lower extremity access (HR, 1.67; 95% CI, 1.35-2.05; $P < .001$), human immunodeficiency virus or acquired immunodeficiency syndrome (HR, 1.44; 95% CI, 1.13-1.82; $P < .001$), White race (HR, 1.43; 95% CI, 1.35-1.51; $P < .001$), congestive heart failure (HR, 1.33; 95% CI, 1.26-1.41; $P < .001$), chronic obstructive pulmonary disease (HR, 1.23; 95% CI, 1.15-1.31; $P < .001$), and AV graft placement (HR, 1.12; 95% CI, 1.02-1.23, $P = .016$) were most associated with poor survival. Factors associated with improved survival were never smoking (HR, .73; 95% CI, 0.67-0.79; $P < .001$), prior/quit smoking (HR, .78; 95% CI, 0.72-0.84; $P < .001$), preoperative home living (HR, .75; 95% CI, 0.68-0.83; $P < .001$), and hypertension (HR, .89; 95% CI, 0.8-0.99; $P = .03$).

Conclusions: Long-term survival in Medicare patients undergoing AV access creation is poor with nearly two-thirds of patients having died at 5 years. There are many modifiable risk factors that may improve survival in these patients and give an opportunity for transplantation. (J Vasc Surg 2024;79:925-30.)

Keywords: Dialysis; Access; Survival

Poorer outcome with AVGs?
(selection bias?)

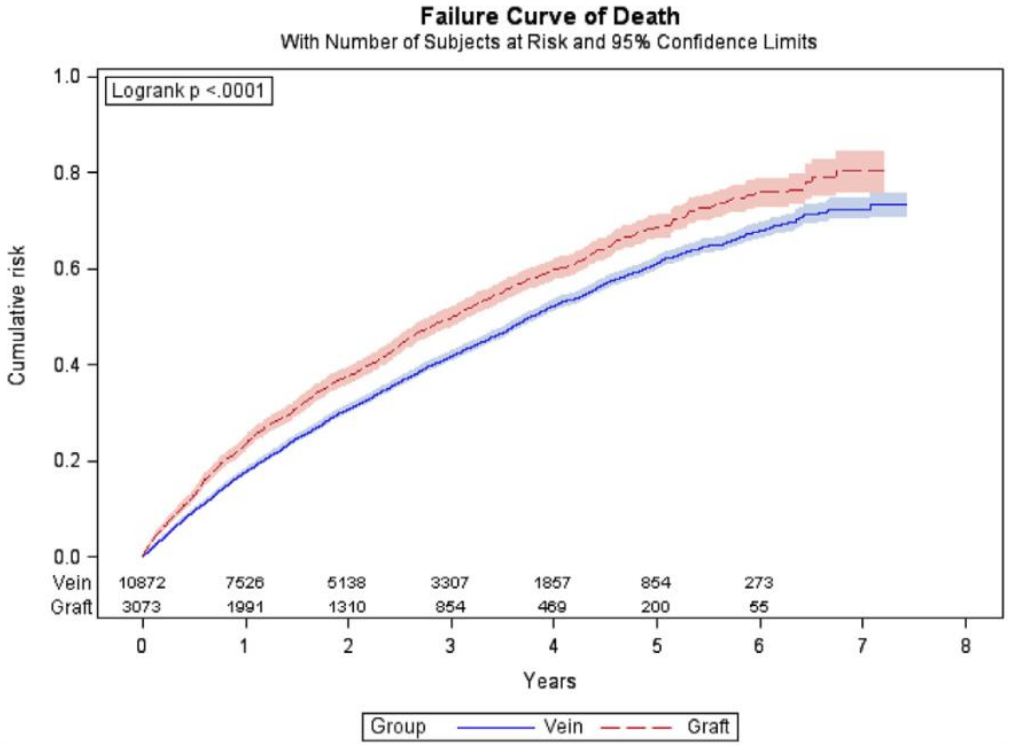

Figure. Long-term mortality comparing autogenous access with arteriovenous (AV) grafts.

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A randomized multicenter study of the outcome of brachial-basilic arteriovenous fistula and prosthetic brachial-antecubital forearm loop as vascular access for hemodialysis

Xavier H. A. Keuter, MD,[a] André A. E. A. De Smet, MD,[b] Alfons G. H. Kessels, MD,[c] Frank M. van der Sande, MD,[d] Rob J. Th. J. Welten, MD,[e] and Jan H. M. Tordoir, MD, PhD,[a] *Maastricht, Rotterdam, and Heerlen, The Netherlands*

Background: Vascular access is a necessity for patients with end-stage renal disease who need chronic intermittent hemodialysis. According to Kidney Disease Outcomes Quality Initiative (KDOQI) guidelines, radial-cephalic (RC) and brachial-cephalic (BC) arteriovenous fistulas (AVF) are the first and second choice for vascular access, respectively. If these options are not possible, an autogenous brachial-basilic fistula in the upper arm (BBAVF) or a prosthetic brachial-antecubital forearm loop (PTFE loop) may be considered. Until now, it was not clear which access type was preferable. We have performed a randomized study comparing BBAVF and prosthetic implantation in patients without the possibility for RCAVF or BCAVF.

Methods: Patients with failed primary/secondary access or inadequate arterial and/or venous vessels were randomized for either BBAVF or PTFE loop creation. The numbers of complications and interventions were recorded. Kaplan-Meier method was used to calculate primary, assisted-primary and secondary patency rates. The patency rates were compared with the log-rank test. Complication and intervention rates were compared with the Mann-Whitney test.

Results: A total of 105 patients were randomized for a BBAVF or PTFE loop (52 vs 53, respectively). Primary and assisted-primary 1-year patency rates were significantly higher in the BBAVF group: 46% ± 7.4% vs 22% ± 6.1% (P = .005) and 87% ± 5.0% vs 71% ± 6.7% (P = .043) for the BBAVF and PTFE group, respectively. Secondary patencies were comparable for both groups; 89% ± 4.6% vs 85% ± 5.2% for the BBAVF and PTFE group, respectively. The incidence rate of complications was 1.6 per patient-year in the BBAVF group vs 2.7 per patient-year in the PTFE group. Patients in the BBAVF group needed a total of 1.7 interventions per patient-year vs 2.7 per patient-year for the PTFE group.

Conclusion: These data show a significantly better primary and assisted-primary patency in the BBAVF group compared with the PTFE group. Furthermore, in the BBAVF group, fewer interventions were needed. Therefore, we conclude that BBAVF is the preferred choice for vascular access if RCAVF or BCAVF creation is impossible, or when these types of access have already failed. (J Vasc Surg 2008;47:395-401.)

RCT

TBBAVF > Forearm AVGs

Less complications
Fewer reinterventions
Higher patency

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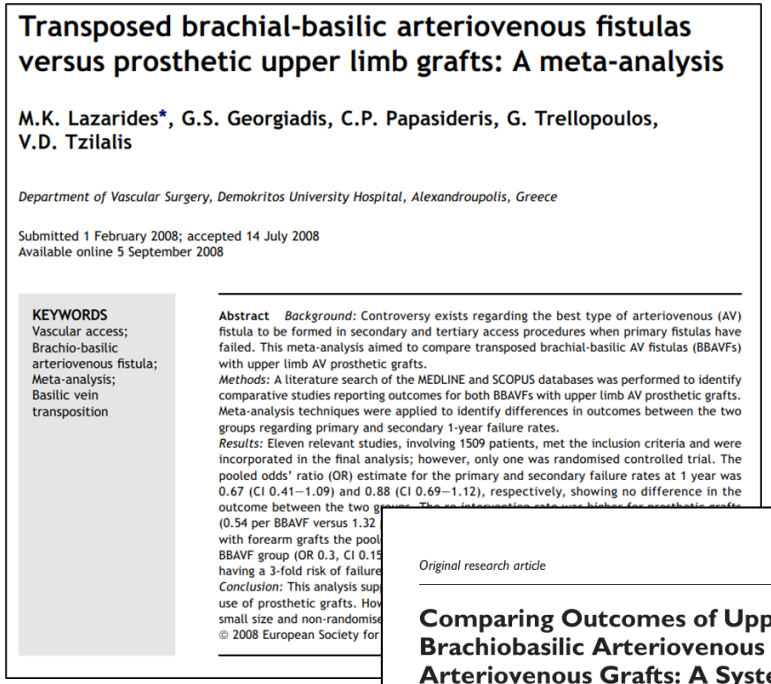

Transposed brachial-basilic arteriovenous fistulas versus prosthetic upper limb grafts: A meta-analysis

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Submitted 1 February 2008; accepted 14 July 2008
Available online 5 September 2008

KEYWORDS
Vascular access;
Brachio-basilic arteriovenous fistula;
Meta-analysis;
Basilic vein transposition

Abstract *Background:* Controversy exists regarding the best type of arteriovenous (AV) fistula to be formed in secondary and tertiary access procedures when primary fistulas have failed. This meta-analysis aimed to compare transposed brachial-basilic AV fistulas (BBAVFs) with upper limb AV prosthetic grafts.
Methods: A literature search of the MEDLINE and SCOPUS databases was performed to identify comparative studies reporting outcomes for both BBAVFs with upper limb AV prosthetic grafts. Meta-analysis techniques were applied to identify differences in outcomes between the two groups regarding primary and secondary 1-year failure rates.
Results: Eleven relevant studies, involving 1509 patients, met the inclusion criteria and were incorporated in the final analysis; however, only one was randomised controlled trial. The pooled odds' ratio (OR) estimate for the primary and secondary failure rates at 1 year was 0.67 (CI 0.41–1.09) and 0.88 (CI 0.69–1.12), respectively, showing no difference in the outcome between the two
(0.54 per BBAVF versus 1.32
with forearm grafts the pool
BBAVF group (OR 0.3, CI 0.15
having a 3-fold risk of failure
Conclusion: This analysis sup
use of prosthetic grafts. How
small size and non-randomise
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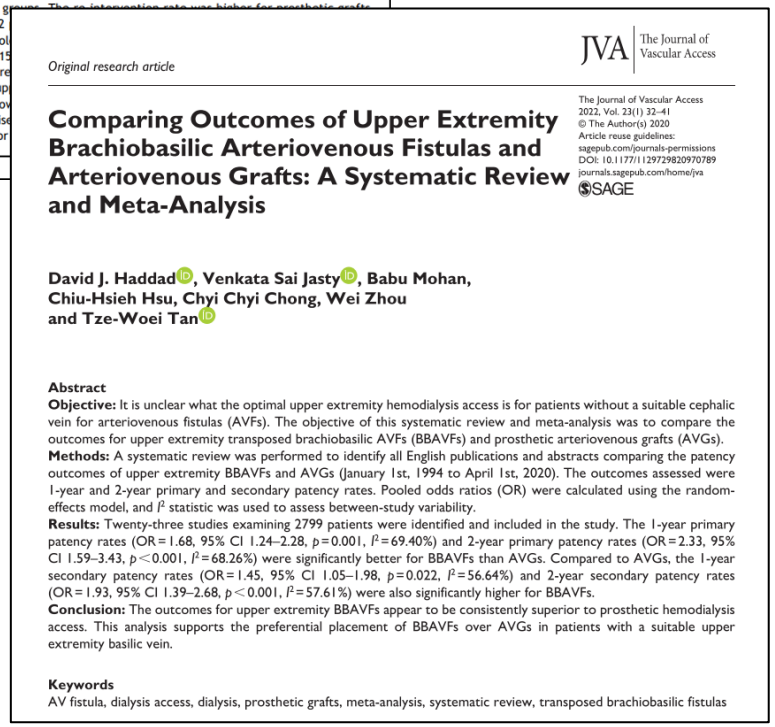

Original research article

JVA The Journal of Vascular Access

Comparing Outcomes of Upper Extremity Brachiobasilic Arteriovenous Fistulas and Arteriovenous Grafts: A Systematic Review and Meta-Analysis

The Journal of Vascular Access
2022, Vol. 23(1) 32–41
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DOI: 10.1177/1129729820970789
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Abstract
Objective: It is unclear what the optimal upper extremity hemodialysis access is for patients without a suitable cephalic vein for arteriovenous fistulas (AVFs). The objective of this systematic review and meta-analysis was to compare the outcomes for upper extremity transposed brachiobasilic AVFs (BBAVFs) and prosthetic arteriovenous grafts (AVGs).
Methods: A systematic review was performed to identify all English publications and abstracts comparing the patency outcomes of upper extremity BBAVFs and AVGs (January 1st, 1994 to April 1st, 2020). The outcomes assessed were 1-year and 2-year primary and secondary patency rates. Pooled odds ratios (OR) were calculated using the random-effects model, and I^2 statistic was used to assess between-study variability.
Results: Twenty-three studies examining 2799 patients were identified and included in the study. The 1-year primary patency rates (OR = 1.68, 95% CI 1.24–2.28, $p = 0.001$, $I^2 = 69.40\%$) and 2-year primary patency rates (OR = 2.33, 95% CI 1.59–3.43, $p < 0.001$, $I^2 = 68.26\%$) were significantly better for BBAVFs than AVGs. Compared to AVGs, the 1-year secondary patency rates (OR = 1.45, 95% CI 1.05–1.98, $p = 0.022$, $I^2 = 56.64\%$) and 2-year secondary patency rates (OR = 1.93, 95% CI 1.39–2.68, $p < 0.001$, $I^2 = 57.61\%$) were also significantly higher for BBAVFs.
Conclusion: The outcomes for upper extremity BBAVFs appear to be consistently superior to prosthetic hemodialysis access. This analysis supports the preferential placement of BBAVFs over AVGs in patients with a suitable upper extremity basilic vein.

Keywords
AV fistula, dialysis access, dialysis, prosthetic grafts, meta-analysis, systematic review, transposed brachiobasilic fistulas

Metaanalyser

1y and 2y sec patency:

TBBAVF > AVGs
(OR= 1.68, CI 1.24-2.28, p<0.001)
(OR= 2.33, CI 1.59-3.43, p<0.001)

Reintervention rate:
TBBAVF > AVGs
(0.54 vs 1.32)

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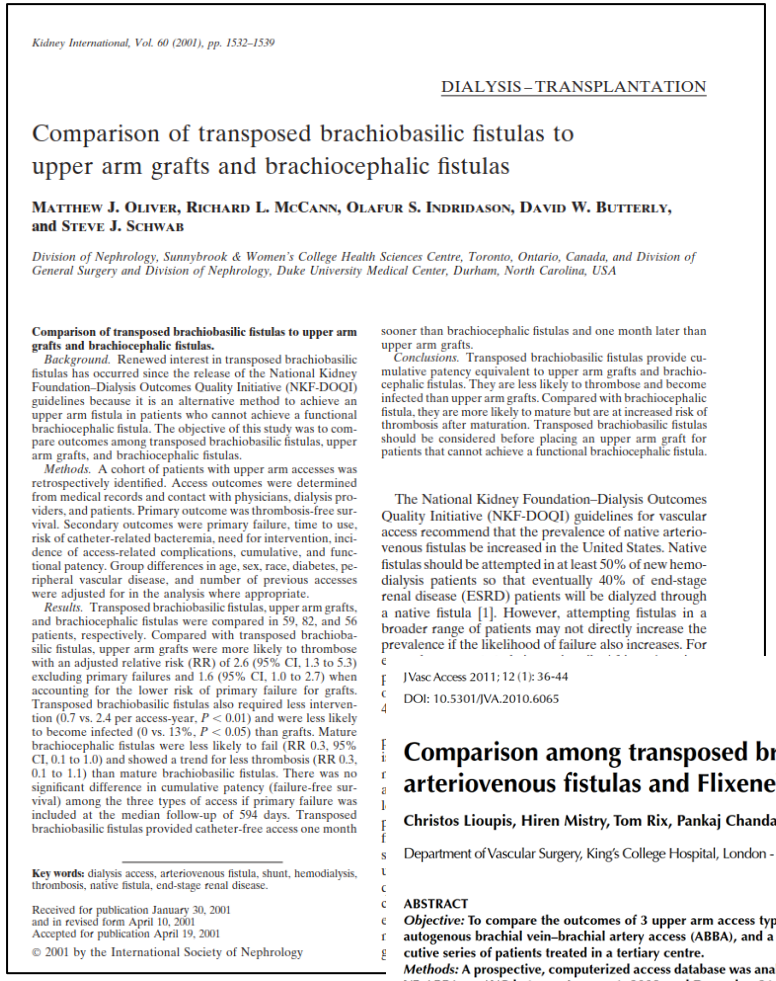

Kidney International, Vol. 60 (2001), pp. 1532–1539

DIALYSIS – TRANSPLANTATION

Comparison of transposed brachiobasilic fistulas to upper arm grafts and brachiocephalic fistulas

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Comparison of transposed brachiobasilic fistulas to upper arm grafts and brachiocephalic fistulas.

Background. Renewed interest in transposed brachiobasilic fistulas has occurred since the release of the National Kidney Foundation–Dialysis Outcomes Quality Initiative (NKF-DOQI) guidelines because it is an alternative method to achieve an upper arm fistula in patients who cannot achieve a functional brachiocephalic fistula. The objective of this study was to compare outcomes among transposed brachiobasilic fistulas, upper arm grafts, and brachiocephalic fistulas.

Methods. A cohort of patients with upper arm accesses was retrospectively identified. Access outcomes were determined from medical records and contact with physicians, dialysis providers, and patients. Primary outcome was thrombosis-free survival. Secondary outcomes were primary failure, time to use, risk of catheter-related bacteremia, need for intervention, incidence of access-related complications, cumulative, and functional patency. Group differences in age, sex, race, diabetes, peripheral vascular disease, and number of previous accesses were adjusted for in the analysis where appropriate.

Results. Transposed brachiobasilic fistulas, upper arm grafts, and brachiocephalic fistulas were compared in 59, 82, and 56 patients, respectively. Compared with transposed brachiobasilic fistulas, upper arm grafts were more likely to thrombose with an adjusted relative risk (RR) of 2.6 (95% CI, 1.3 to 5.3) excluding primary failures and 1.6 (95% CI, 1.0 to 2.7) when accounting for the lower risk of primary failure for grafts. Transposed brachiobasilic fistulas also required less intervention (0.7 vs. 2.4 per access-year, $P < 0.01$) and were less likely to become infected (0 vs. 13%, $P < 0.05$) than grafts. Mature brachiocephalic fistulas were less likely to fail (RR 0.3, 95% CI, 0.1 to 1.0) and showed a trend for less thrombosis (RR 0.3, 0.1 to 1.1) than mature brachiobasilic fistulas. There was no significant difference in cumulative patency (failure-free survival) among the three types of access if primary failure was included at the median follow-up of 594 days. Transposed brachiobasilic fistulas provided catheter-free access one month sooner than brachiocephalic fistulas and one month later than upper arm grafts.

Conclusions. Transposed brachiobasilic fistulas provide cumulative patency equivalent to upper arm grafts and brachiocephalic fistulas. They are less likely to thrombose and become infected than upper arm grafts. Compared with brachiocephalic fistula, they are more likely to mature but are at increased risk of thrombosis after maturation. Transposed brachiobasilic fistulas should be considered before placing an upper arm graft for patients that cannot achieve a functional brachiocephalic fistula.

Key words: dialysis access, arteriovenous fistula, shunt, hemodialysis, thrombosis, native fistula, end-stage renal disease.

Received for publication January 30, 2001
and in revised form April 10, 2001
Accepted for publication April 19, 2001

The National Kidney Foundation–Dialysis Outcomes Quality Initiative (NKF-DOQI) guidelines for vascular access recommend that the prevalence of native arteriovenous fistulas be increased in the United States. Native fistulas should be attempted in at least 50% of new hemodialysis patients so that eventually 40% of end-stage renal disease (ESRD) patients will be dialyzed through a native fistula [1]. However, attempting fistulas in a broader range of patients may not directly increase the prevalence if the likelihood of failure also increases. For

JVasc Access 2011; 12 (1): 36-44
DOI: 10.5301/JVA.2010.6065

ORIGINAL ARTICLE

Comparison among transposed brachiobasilic, brachiobrachial arteriovenous fistulas and Flixene™ vascular graft

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ABSTRACT

Objective: **To compare the outcomes of 3 upper arm access types: transposed brachiobasilic arteriovenous fistula (BBAVF), autogenous brachial vein–brachial artery access (ABBA), and a new type of ePTFE graft (Flixene™ graft) (AVG), in a consecutive series of patients treated in a tertiary centre.**

Methods: **A prospective, computerized access database was analysed retrospectively to identify all patients undergoing BBAVF, ABBA, or AVG between January 1, 2008, and December 31, 2009.**

Results: **A total of 108 patients were identified; of whom 45 had BBAVF, 15 ABBA, and 48 ePTFE brachioaxillary AVG. Early failure was similar in all 3 groups. The 18-month functional patency rates for the ABBAs, BBAVFs, and grafts were 27%, 51%, and 55%, respectively. The median time to first use for AVGs was significantly shorter (p<0.0001). Complications were not more frequent in AVGs than ABBAs and BBAVFs (p=0.127). The total number of access interventions was similar between the AVG and ABBA groups (p=0.58), but it was significantly higher in the AVG group compared with the BBAVF group (p<0.0001).**

Conclusions: **This study supports the current recommendations of the NKF Kidney Disease Outcomes Quality Initiative for using BBAVFs as third choice after radiocephalic and brachiocephalic arteriovenous fistulas. We also showed good results with a new type of prosthetic graft (Flixene™ graft) that allows cannulation within days of implantation. We now favour the use of this graft instead of basilic vein transposition in elderly patients with short life expectancy and urgent need of renal access.**

Key words: Brachial vein-brachial artery fistula, Flixene™ graft, Transposed brachiobasilic arteriovenous fistula

Retrospective/Register

Reintervention rate:
TBBAVF > AVGs
(0.7 vs 2.4, p<0.01)

Infection rate:
TBBAVF > AVGs
(0% vs 13%, p<0.05)

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Outcomes of basilic vein transposition versus polytetrafluoroethylene forearm loop graft as tertiary vascular access

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ABSTRACT

Background: Radial-cephalic arteriovenous fistula and brachial-cephalic arteriovenous fistula are the first and second choices for creating vascular access in dialysis patients as recommended by the National Kidney Foundation Kidney Disease Outcomes Quality Initiative. Basilic vein transposition or use of a forearm (polytetrafluoroethylene [PTFE]) loop graft is recommended thereafter. The aim of this study was twofold: first, to compare the outcomes and patency rates of patients treated with a basilic vein transposition with those of patients treated with a PTFE loop; and second, to identify patient-related factors of influence on patency rates.

Methods: Data collected in our prospectively maintained database of patients with chronic renal dysfunction requiring hemodialysis were analyzed. From April 2006 to August 2017, there were 55 patients with a basilic vein transposition and 75 patients with a PTFE loop included. Primary, primary assisted, and secondary patency rates were calculated. Multivariate analysis was used to identify factors of influence on survival. Incidence rates of complications and reinterventions were calculated and compared.

Results: Mean follow-up time was 29 months. A significantly higher 2-year primary assisted patency rate was found for the basilic vein transposition group (72.7% ± 6.5% vs 47.6% ± 6.2%; $P < .01$). The 2-year primary patency rates and secondary patency rates were comparable between basilic vein transposition and PTFE loop (25.1% ± 6.6% vs 13.7% ± 4.4% [$P = .11$] and 75.5% ± 6.5% vs 73.9% ± 5.3% [$P = .17$], respectively). Cox regression identified body mass index (hazard ratio [HR], 1.77; 95% confidence interval [CI], 1.05-2.98; $P = .03$) and age (HR, 0.54; 95% CI, 0.32-0.91; $P = .02$) as predictors for failure regarding primary patency in PTFE loop patients. Previous catheter use (HR, 0.29; 95% CI, 0.12-0.70; $P = .006$) and the presence of diabetes (HR, 3.32; 95% CI, 1.50-7.39; $P = .003$) were independent predictors for failure regarding primary patency in basilic vein transposition patients. The incidence rate of total complications was significantly higher in the PTFE loop group with 0.70 per patient-year (PY^{-1}) compared with 0.28 PY^{-1} in the basilic vein transposition group ($P = .001$). In terms of intervention rate, a significantly higher percutaneous transluminal angioplasty rate and surgical revision rate were found in the PTFE loop group than in the basilic vein transposition group (1.77 PY^{-1} vs 1.05 PY^{-1} [$P = .022$] and 0.20 PY^{-1} vs 0.07 PY^{-1} [$P = .002$], respectively).

Conclusions: In this nonrandomized study, basilic vein transposition has better primary assisted patency, fewer complications, and fewer reinterventions compared with PTFE loop. (J Vasc Surg 2019;69:1180-6.)

Keywords: Vascular access; Graft; Dialysis; Outcomes; Patency

TBBAVF > Forearm AVGs

2y Primary Assisted Patency	72.7% vs 47.6%
Complications rate	0.28 vs 0.70/year
Reintervention rate	1.05 vs 1.77/year

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From the Society for Clinical Vascular Surgery

Comparison of one-stage and two-stage upper arm brachiobasilic arteriovenous fistula in the Vascular Quality Initiative

Check for updates

Tze-Woei Tan, MD,[a] Jeffrey J. Siracuse, MD,[b] Benjamin S. Brooke, MD, PhD,[c] Donald T. Baril, MD,[d] Karen Woo, MD, MS,[d] Denis Rybin, PhD,[e] Gheorghe Doros, PhD,[e] *and* Alik Farber, MD,[a] *Tucson, Ariz; Boston, Mass; Salt Lake City, Utah; and Los Angeles, Calif*

ABSTRACT

Objective: An upper arm brachiobasilic arteriovenous fistula (BBAVF) is a reliable autogenous hemodialysis access created with a one-stage or two-stage technique. Although both techniques are variably used, the optimal approach is uncertain. In this study, we compared the outcomes of one-stage and two-stage BBAVF procedures.

Methods: We identified 2648 patients who had received BBAVFs within the Vascular Quality Initiative data set (2010-2016) and compared those created using the one-stage and two-stage technique. The primary outcome measures were primary and secondary patency rates at 12 months. Other outcomes assessed were wound infection, steal, and swelling at 3 months. The log-rank test was used to evaluate patency by Kaplan-Meier analysis. Cox proportional hazards models were used to examine the adjusted association between surgical technique and outcomes.

Results: There were 1234 (47%) one-stage and 1414 (53%) two-stage BBAVFs in the study cohort, including 1848 (70%) patients who were on dialysis at the time of surgery and 1795 (68%) patients with a history of previous access. Patients who underwent a one-stage BBAVF were more likely to be male (54%
and to have a history of coronary artery disease (22% vs 17%; $P = .001$)
vein diameters (4.1 vs 3.4 mm; $P < .001$) and have the procedure in a
with patients undergoing a two-stage procedure. The 12-month p
BBAVF (49.1% vs 40.4%; $P = .005$), although the secondary patenc
Postoperative bleeding (4% vs 1.5%; $P < .001$), wound infection (1.01%
$P = .006$) were higher for one-stage BBAVFs. In multivariable analy
(adjusted hazard ratio [aHR], 1.12; 95% confidence interval [CI], 0.97-1.
95% CI, 0.14-1.25, $P = .12$) were similar between the two approaches
lower for two-stage BBAVFs (aHR, 0.35; 95% CI, 0.16-0.77; $P = .009$).

Conclusions: Whereas surgeons were more likely to perform a two-
failed access and smaller basilic vein, our data show no difference
two-stage BBAVFs at 12 months. (J Vasc Surg 2019;69:1187-95.)

Keywords: Brachial-basilic arteriovenous fistula; Brachiobasilic transpo
fistula; Autologous hemodialysis access

RESEARCH ARTICLE

One-Stage vs. Two-Stage Brachio-Basilic Arteriovenous Fistula for Dialysis Access: A Systematic Review and a Meta-Analysis

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Most studies advocate that advantages seems to appear with two-stage construction, but there are some studies confirming similar results with one-stage operations by experienced surgeons

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A Comparison of Two Surgical Techniques for the Second Stage of Brachiobasilic Arteriovenous Fistula Creation

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Abstract: Two-stage transposed brachiobasilic arteriovenous fistula is a common procedure after brachiobasilic fistula (BBF) creation. Different techniques can be used for basilic vein transposition but few comparative literature reports are available. The aim of our study was to compare two different techniques for basilic vein transposition. The first maintains the BBF anastomosis and the basilic vein is placed in a subcutaneous pocket (BBAVF). The second transects the basilic vein at the BBF anastomosis and tunnels it superficially, with a new BBF in the brachial artery (BBAVFTn). From 2009 to 2014, all patients who underwent basilic vein superficialization were treated by one of the two techniques, recorded in a dedicated database and retrospectively reviewed. The surgeon chose the technique on the basis of personal preference. The two techniques were compared in terms of perioperative complications, length of hospital stay, time of cannulation, ease of cannulation, and long-term patency. Eighty patients were included in the study: 40 (50%) BBAVF and 40 (50%) BBAVFTn. Length of hospital stay was similar in the two groups (median [interquartile range–IQR] 3(2) [BBAVF] vs. 2(1) [BBAVFTn], $P = 0.52$, respectively). BBAVFTn was associated with a lower hematoma incidence (1/40 [2.5%] vs. 15/40 [37.5%], $P = 0.01$), shorter first cannulation time (median IQR: 11(10) vs. 23(8) days, $P = 0.01$) and easier cannulation compared with BBAVF (32/40 [80%] vs. 15/40 [37.5%], $P < 0.001$). Median (IQR) follow-up was 16(7) months. No statistical differences in terms of primary and assisted primary patency were found in BBAVFTn vs. BBAVF (at 24 months 91(5) vs. 71(7), $P = 0.21$ and 93(6) vs. 78(8), $P = 0.33$, respectively). Patients who underwent BBAVFTn surgery showed fewer surgical complications, better dialytic performance, and easier cannulation compared with those submitted to BBAVF. **Key Words:** Hemodialysis arteriovenous access—Brachiobasilic arteriovenous fistula—Basilic vein transposition.

Transposition >>>Superficialisation

<Complications
>Hemodialysis performance
>Cannulation

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Outcome	PTFE Upper-arm Graft (AVG)	Transposed Brachiobasilic AVF (TBBAVF)	Brachio-cephalic AVF (BCAVF)	Radio-cephalic AVF (RCAVF)	Main Evidence Sources
Infection rate (lifetime risk or annualized)	**15–35 % (often leading to explant)**	**1–5 %**	1–3 %	< 2 %	KDOQI 2019; ESVS 2018; DOPPS 2017; Swedvasc 2021
Thrombosis incidence (annual)	**0.6–1.0 episodes / pt-yr**	**0.2–0.4 / pt-yr**	0.2–0.3 / pt-yr	0.15–0.25 / pt-yr	Oliver *KI* 2001; Tan *JVS* 2020; VQI 2022
Aneurysm / pseudoaneurysm	**10–20 % (usually at needle sites)**	**5–10 %**	5–10 %	5–10 %	Shemesh *JVS* 2015; Robbin *Radiology* 2002
Revision / maintenance interventions (procedures / pt-yr)	**1.0–1.5**	**0.3–0.6**	0.3–0.5	0.2–0.4	Vascular Access Soc 2019; VQI; UKKA 2023
Need for maturation treatment (pre-use PTA / ligation / revision)	***Not applicable***	**20–30 %**	15–25 %	25–40 %	Shemesh 2015; Taghizadeh 2003; Lee *JASN* 2011
Steal syndrome (symptomatic)	**5–10 %**	**5–8 %**	3–7 %	1–3 %	ESVS 2018; Swedvasc 2020
Primary patency (% surviving without intervention)	**1 yr 45–60 3 yr 25–35 5 yr 10–20**	**1 yr 60–70 3 yr 45–55 5 yr 35–45**	1 yr 65–75 3 yr 45–55 5 yr 35–45	1 yr 55–65 3 yr 35–45 5 yr 25–35	Dember *NEJM* 2008; Shemesh 2015; Robbin 2002
Assisted primary patency (%)	**1 yr 60–70 3 yr 35–45 5 yr 20–30**	**1 yr 75–85 3 yr 60–70 5 yr 50–60**	1 yr 80–85 3 yr 65–75 5 yr 55–65	1 yr 70–80 3 yr 55–65 5 yr 45–55	
Secondary patency (%)	**1 yr 70–80 3 yr 45–55 5 yr 30–40**	**1 yr 85–90 3 yr 70–80 5 yr 60–70**	1 yr 85–90 3 yr 70–80 5 yr 60–70	1 yr 80–90 3 yr 65–75 5 yr 55–65	

Interpretation highlights:

Hierarchy of long-term durability:
RCAVF ≈ BCAVF ≈ TBBAVF ≫ PTFE AVG.

At 5 years, typical **secondary patency**:

- RCAVF ≈ 60 %
- BCAVF ≈ 65 %
- TBBAVF ≈ 65–70 %
- AVG ≈ 35 %.

TBBAVF vs AVG: Similar early primary patency (≈60 %), but TBBAVF maintains almost **double** the secondary patency by 3–5 years.

Intervention burden: AVGs ≈ 1–1.5 procedures / patient-year; AVFs ≈ 0.3–0.5 procedures / patient-year.

Infection risk: AVF ≪ AVG (roughly 5 % vs 20–35 %).