3ème journée de l'abord vasculaire pour hémodialyse

# QUE FAIRE DEVANT L'ÉPUISEMENT DU CAPITAL VEINEUX ?

**Dr Amine TARMIZ**
**CHU Sahloul de Sousse**
**Service de Chirurgie Cardiovasculaire et Thoracique**

# CONFLIT D’INTÉRÊT

# RÉFÉRENCES ICONOGRAPHIQUES

# DEFINITION

## « VA failure » ou « End-stage VA failure »

- **Pas de consensus**
- **Groupe de patients où les abords vasculaires classiques ont été épuisés.**
- **Quelques abords complexes restent possibles mais « challenging cases »**

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Leading European Nephrology

*Clinical Kidney Journal*, 2015, vol. 8, no. 5, 590–593

doi: 10.1093/ckj/sfv055
Advance Access Publication Date: 5 July 2015
Original Article

ORIGINAL ARTICLE

# End-stage vascular access failure: can we define and can we classify?

Julien Al Shakarchi[1,2], Jay Nath[1], Damian McGrogan[1], Aurangzaib Khawaja[1,2], Melanie Field[1], Robert G. Jones[3], and Nicholas Inston[1,2]

[1]Department of Renal Surgery, QEHB, University Hospital Birmingham, Birmingham, UK, [2]ReDVA Research Consortium, and [3]Department of Radiology, QEHB, University Hospital Birmingham, Birmingham, UK

Correspondence to: Nicholas Inston; E-mail: Nicholas.inston2@uhb.nhs.uk

**« Bilateral venous occlusion or severe stenosis which renders standard upper limb access options non-viable »**

ORIGINAL ARTICLE

Port J Nephrol Hypert 2018; 32(4): 324-330 • Advance Access publication 13 December 2018

# Management of end-stage vascular access failure patients: a retrospective analysis

Joana Gameiro, José Agapito Fonseca, Sofia Jorge, José António Lopes

Division of Nephrology and Renal Transplantation, Department of Medicine, Centro Hospitalar Lisboa Norte, EPE

**VA failure :** recurrent loss of permanent VA for HD, namely recurrent AVF or AVG thrombosis and/or recurrent CVC dysfunction, requiring intervention.

**ES-VAF :** inability of catheter insertion into any of the central veins due to stenosis or thrombosis documented by computed tomography angiogram or

ckj OXFORD ERA-EDTA Leading European Nephrology

*Clinical Kidney Journal*, 2015, vol. 8, no. 5, 590–593

doi: 10.1093/ckj/sfv055
Advance Access Publication Date: 5 July 2015
Original Article

1. No upper limb VA option
2. No Lower limb VA option
3. No options at any site

These can be further subdivided into the site of occlusion/stenosis. Stenosis was defined as greater than 50% [with a left (L) and right (R) classification];

1. No upper limb VA option
   (a) Axillary vein stenosis
   (b) Subclavian vein stenosis
   (c) Brachiocephalic/innominate vein stenosis
   (d) SVC stenosis
   (e) Arterial insufficiency
2. No Lower limb VA option
   (a) Iliac stenosis
   (b) IVC stenosis
   (c) Arterial insufficiency
3. No options at any site
   (a) CVC via a non-standard site (e.g. translumbar, transhepatic, other)
   (b) No access options and treatment withdrawal

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

## *8.1. Tertiary vascular access*

**8.1.1. Suggested classification of types of tertiary vascular access surgery.** The most appropriate tertiary VA procedure for an individual patient depends on the available vessels and the experience of the surgeon. These may be divided into three groups of increasing risk and complexity, which should therefore generally be considered in sequence:

**Group one** — upper limb, chest wall and translocated autogenous vein from the lower limb (see Chapter 5).

**Group two** — lower limb.

**Group three** — VA spanning the diaphragm, and other unusual VA procedures including upper and lower limb arterio-arterial loops.

# Principes généraux

- Historique des accès vasculaires du patient (causes probables d’échec)

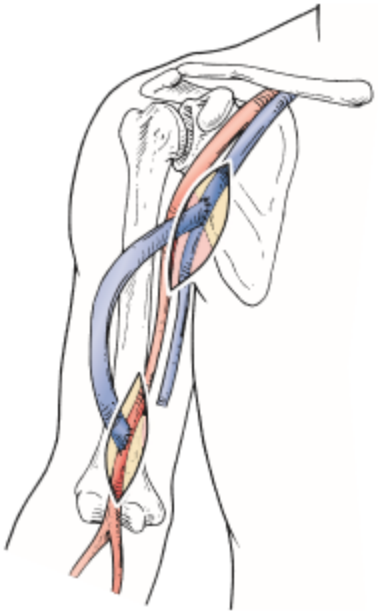
- Imagerie vasculaire :
  Echo-doppler
  Angioscanner
  Phlébographie (Voies veineuses centrales +++)

- Toujours s’assurer de l’épuisement veineux des membres supérieurs (phlébographie +++)

# Translocations des veines du membre inférieur → membre supérieur

- Veine saphène interne :

  3 séries publiées depuis 1980
  perméabilité ???



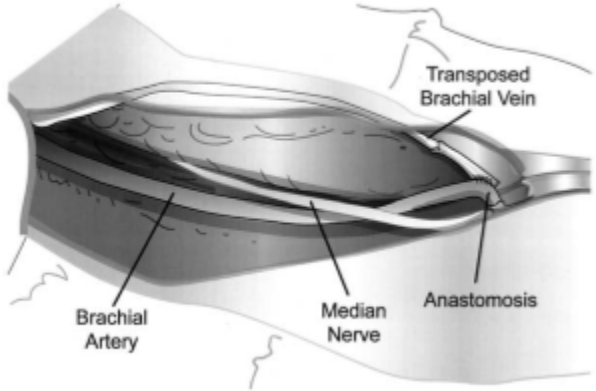
- Veine fémoro-poplitée : 1 étude, 30 cas

  Perméabilité à 1 an = 79%/100%
  Syndrome de vol +++
  Infection du site de prélèvement veineux

# Transposition of the brachial vein: A new source for autologous arteriovenous fistulas

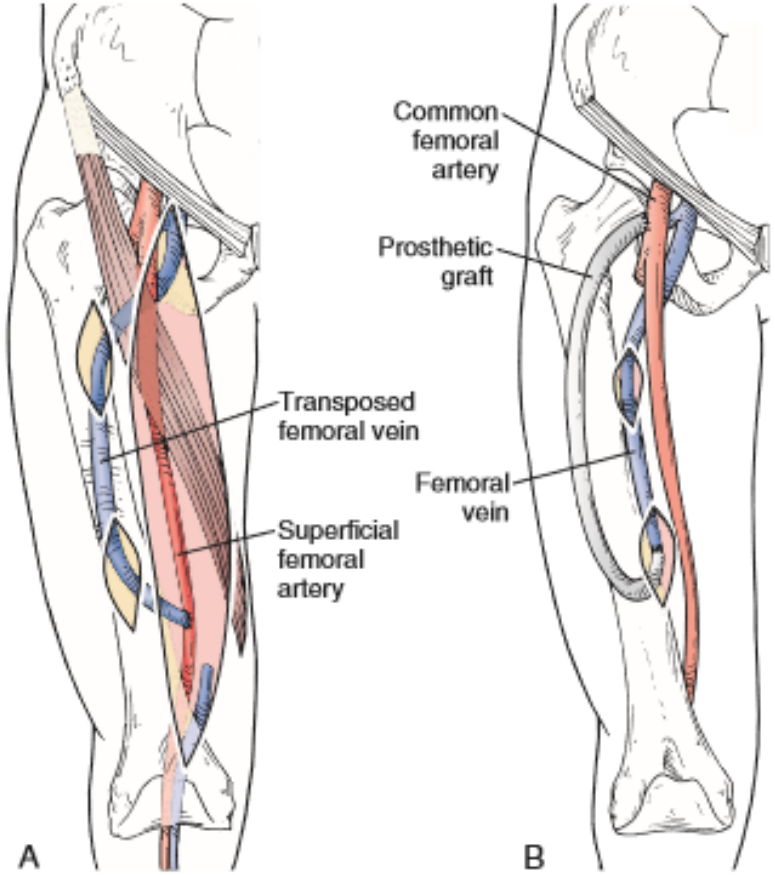
**Hernan A. Bazan, MD,** and **Harry Schanzer, MD,** *Bronx, NY*

**Increasing the prevalence of arteriovenous fistula over arteriovenous synthetic graft is critical for decreasing the morbidity and costs of dialysis patients. This is highlighted in the guidelines set forth by The National Kidney Foundation-Dialysis Outcomes Quality Initiative (NKF-DOQI), which encourage the increased use of autogenous vein in fistula creation. In addition to the basilic and cephalic veins, another source of autogenous vein is the brachial vein, a deep vein of the upper arm. Here we describe 2 patients with absence of adequate superficial veins, in whom a transposed brachial vein was used for the creation of an arteriovenous fistula. (J Vasc Surg 2004;40:184-6.)**

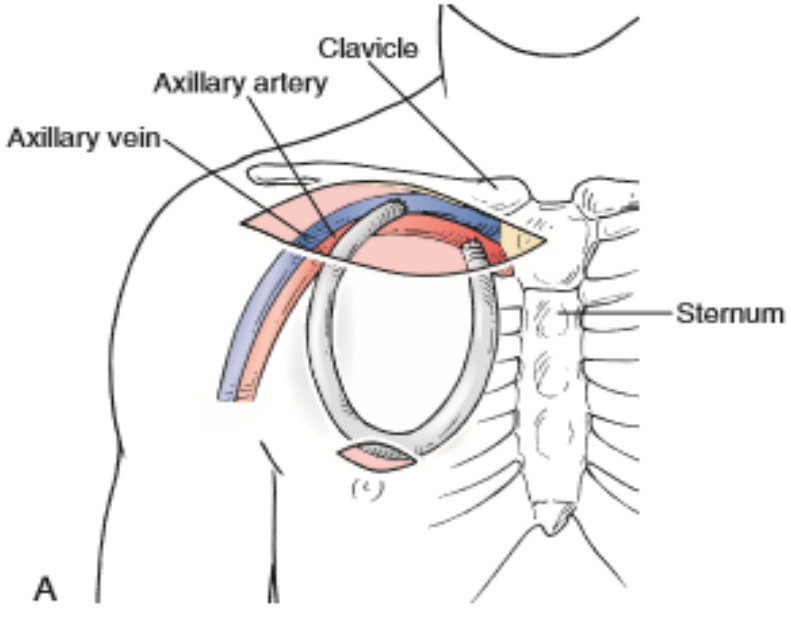



**Maturation ?**
**Œdème du membre**
**Perméabilité ?**

# Transpositions des veines des M



# Pontages AV prothétiques cervico-thoraciques



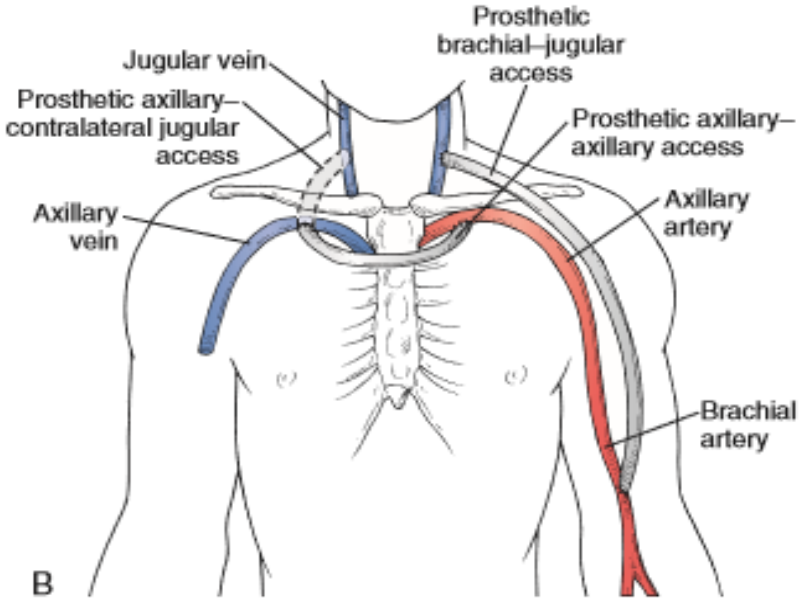
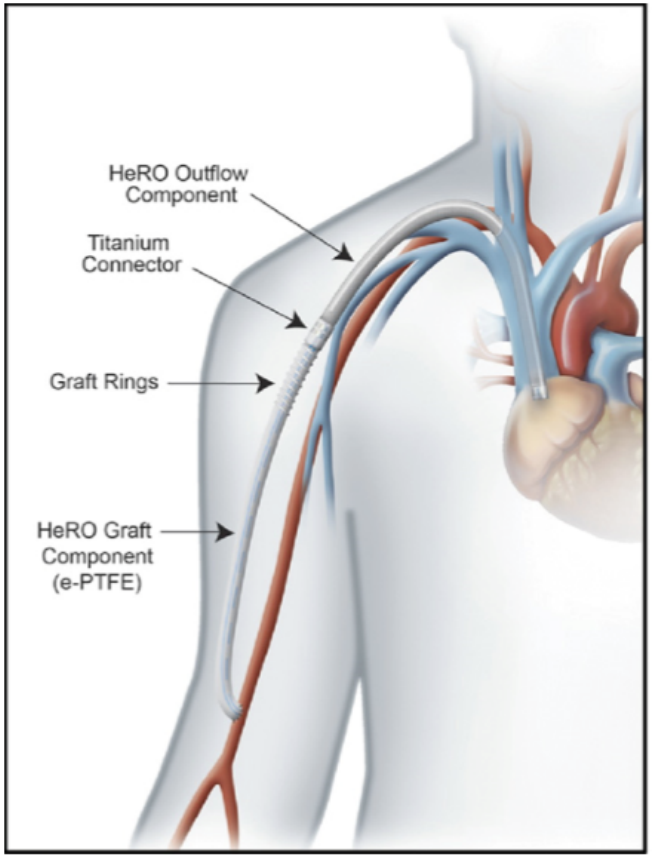



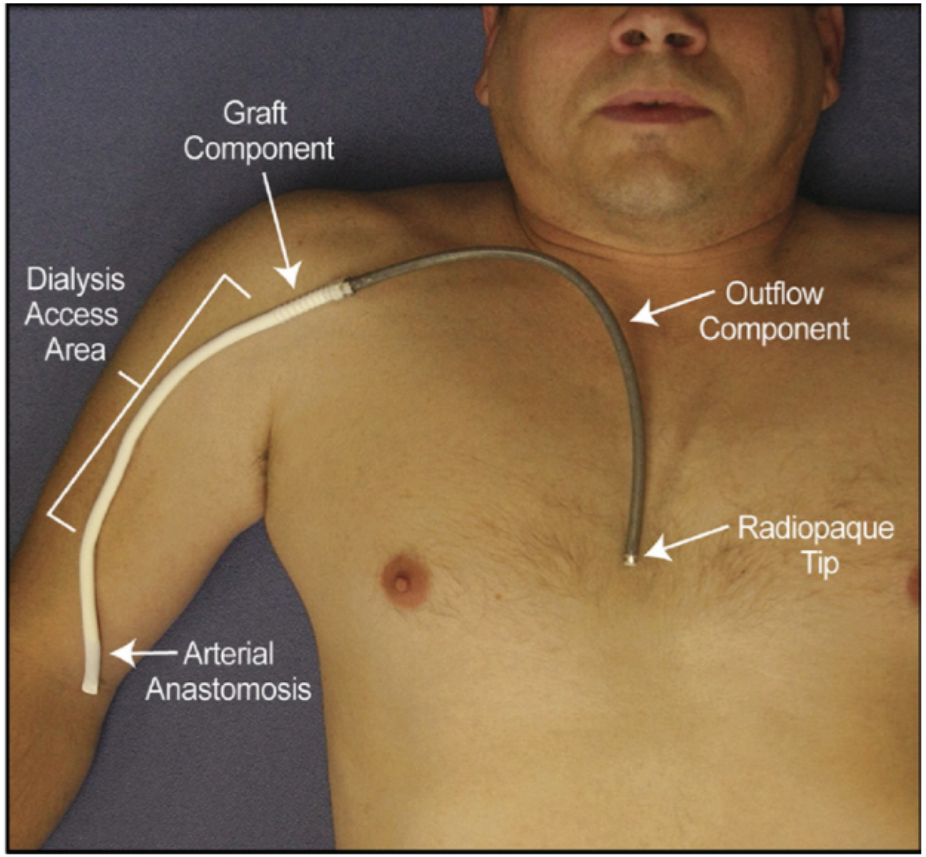
**Table 75-2 Results of Cervical and Chest Wall Access**

| Series | Configuration | Number of Patients | Secondary Patency (%) | | Infection (%) | Access-Related Ischemia (%) |
|---|---|---|---|---|---|---|
| | | | 1-Year | 2-Year | | |
| McCann[27] | AA-cAV<br>AA-cIJV | 26 | 75 | 60 | 4 | 0 |
| Jean-Baptiste et al[28] | Loop AA-iAV | 27 | 87 | 80 | 11 | 0 |
| Kendall et al[1] | Loop AA-iAV | 34 | 59 | 37 | 15 | 0 |
| Vega et al[30] | BA-IJV | 51 | 74 | 63 | 2 | 0 |
| Morsey[29] | AA-cAV | 18 | 89 | | 6 | 0 |

*AA*, Axillary artery; *BA*, brachial artery; *cAV*, contralateral axillary vein; *cIJV*, contralateral internal jugular vein; *iAV*, ipsilateral axillary vein; *IJV*, internal jugular vein.

# Hemodialysis Reliable Outflow (HeRO) graft



From the New England Society for Vascular Surgery

# Initial experience and outcome of a new hemodialysis access device for catheter-dependent patients

**Howard E. Katzman, MD,[a] Robert B. McLafferty, MD,[b] John R. Ross, MD,[c] Marc H. Glickman, MD,[d] Eric K. Peden, MD,[e]** and **Jeffery H. Lawson, MD, PhD,[f]** *Miami, Fla; Springfield, Ill; Bamberg, SC; Norfolk, Va; Houston, Tex; and Durham, NC*

J Vasc Surg 2009;50:600-7.

Eur J Vasc Endovasc Surg (2015) 50, 108–113

REVIEW

# A Review on the Hemodialysis Reliable Outflow (HeRO) Graft for Haemodialysis Vascular Access

**J. Al Shakarchi [a,b,*], J.G. Houston [b,c], R.G. Jones [d], N. Inston [a,b]**

[a] Department of Renal Surgery, QEHB, University Hospital Birmingham, Birmingham, UK
[b] ReDVA Research Consortium, University of Dundee, Dundee, UK
[c] Cardiovascular and Diabetes Medicine, University of Dundee, Dundee, UK
[d] Department of Radiology, QEHB, University Hospital Birmingham, Birmingham, UK

**Table 3.** Summary table of HeRO outcomes of included studies.

| Reference | Number of HeRO | Early failure rate (%) | Primary Patency rate (%) | Secondary Patency rate (%) | Dialysis access associated steal syndrome (%) | HeRO graft infection (%) | HeRO related bacteraemia per 1000 days | Rate of intervention per year | Mean time with HeRO (d/patient) |
|---|---|---|---|---|---|---|---|---|---|
| Katzman[5] | 38 | 2.6 | 38.9[a] | 72.2[a] | 2.6 | 2.6 | 0.7 | 2.5 | 276 |
| Gage[6] | 164 | NS | 48.8 | 90.8 | 1.4 | NS | 0.14 | 1.5 | NS |
| Steerman[7] | 60 | NS | 15 | 57 | 1.7 | 22 | 0.61 | 2.2 | NS |
| Kokkosis[8] | 12 | 8.3 | 9.1 | 45.5 | NS | 25 | NS | 1.5 | NS |
| Wallace[9] | 21 | 14 | 11 | 32 | 22.2 | NS | 0.5 | 3 | 186 |
| Nassar[10] | 52 | 3.8 | 34.8 | 67.6 | 3.8 | 3.8 | 0.13 | 2.2 | 238 |
| Kudlaty[11] | 20 | 30 | 29 | 53.5 | 4.8 | 10 | 0.53 | 1.7 | 238 |
| Torrent[12] | 41 | NS | 8.4 | 53.7 | NS | NS | NS | 2.8 | 380 |
| Weighed Pooled rate % (95% CI) | | 9.2 (1.9–19.9) | 21.9[b] (9.6–37.2) | 59.4[b] (39.4–78.0) | 6.3 (1–14.7) | 10.1 (2.5–21) | | | |

NS = not specified.

[a] 8.6 months rates.

[b] Pooled rate excluding Katzman et al paper.

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NS = not specified.

[a] 8.6 months rates.

[b] Pooled rate excluding Katzman et al paper.

ELSEVIER CrossMark

*Ann Vasc Surg 2015; 29: 90–97*

# The End Stage of Dialysis Access: Femoral Graft or HeRO Vascular Access Device

*Elizabeth A. Kudlaty,[1] Jeanne Pan,[2] Matthew T. Allemang,[2] Daniel E. Kendrick,[2] Vikram S. Kashyap,[2] and Virginia L. Wong,[2] Cleveland, Ohio*

**Table II.** Access characteristics and outcomes

| Characteristics/ outcomes | fAVG ($N = 35$) | HeRO ($N = 20$) | *P* value |
|---|---|---|---|
| Access characteristics | | | |
| Right side | 20 (57.1) | 9 (45) | 0.42 |
| TDC present | 29 (82.9) | 14 (70) | 0.32 |
| CVO | 25 (71.4) | 16 (80) | — |
| HeRO | | | |
| Upper extremity | — | 17 (85) | — |
| Salvage | — | 8 (40) | — |
| de novo | — | 12 (60) | — |
| Outcomes | | | |
| Mean follow-up (years) | 1.50 ± 1.18 | 1.25 ± 0.21 | 0.42 |
| Functional success | 29 (82.9) | 14 (70) | 0.32 |
| Duration of use (days) | 255 ± 336 | 238 ± 326 | 0.86 |
| Mean # of intervention | 1.11 ± 1.47 | 1.65 ± 2.52 | 0.35 |
| Infectious complications | 10 (29) | 3 (15) | 0.33 |
| Bacteremia | 4 (11.4) | 1 (5) | — |
| Graft infection | 5 (14.3) | 2 (10) | — |
| SSI | 1 (2.9) | 0 (0) | — |
| Interventions | | | 0.34 |
| PTA | 19 (29.2) | 19 (40.4) | |
| Stent | 3 (4.6) | 0 (0) | |
| Surgical revision | 8 (12.3) | 5 (10.6) | |
| Thrombectomy | 35 (53.9) | 23 (48.9) | |
| Reason for abandonment | ($N = 17$) | ($N = 8$) | |
| Thrombosis | 10 (58.8) | 5 (62.5) | — |
| Infection | 5 (29.4) | 2 (25) | — |
| Steal | 0 (0) | 1 (12.5) | — |
| Unknown | 2 (11.8) | 0 (0) | — |
| Transplant | 2 (4.8) | 1 (2.4) | — |
| Death | 4 (9.5) | 1 (2.4) | — |

PTA, percutaneous transluminal angioplasty.
Data are expressed as either mean ± standard deviation or *n* (%). Interventions performed at the same time as thrombectomy are included in these data. Transplant and death data are calculated out of the 42 unique patients followed during the study period.

# Pontages AV prothétiques des MI

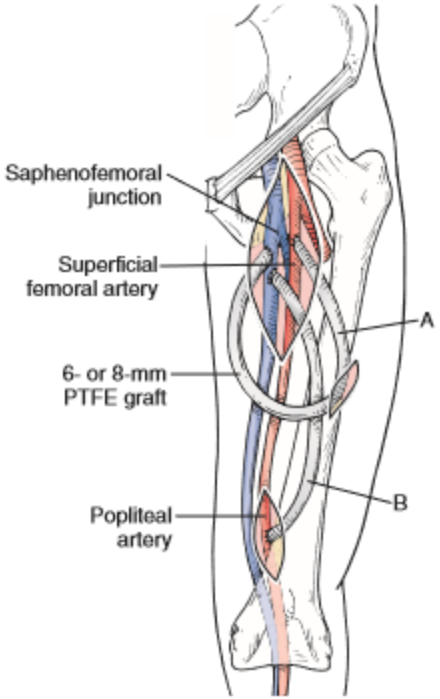



**Figure 75-7** Prosthetic thigh access options: femoral-saphenous loop access **(A)** and popliteal-saphenous straight access **(B).** *PTFE,* Polytetrafluoroethylene.

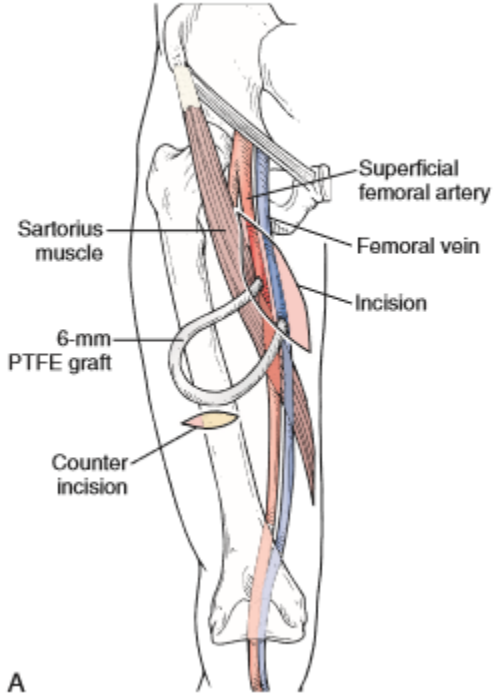
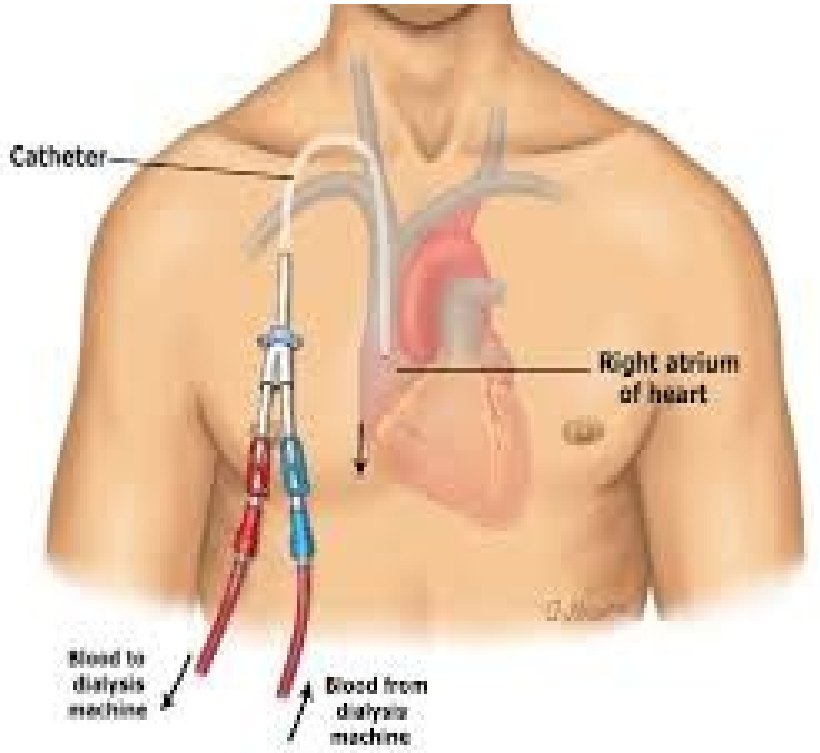



**Table 75-3 Results of Complex Thigh and Upper Extremity Accesses**

| Access Type/ Series | Configuration | Number of Patients | Secondary Patency (%) | | Infection (%) | Wound Complications (%) | Access-Related Ischemia (%) |
|---|---|---|---|---|---|---|---|
| | | | 1-Year | 2-Year | | | |
| **PROSTHETIC THIGH** | | | | | | | |
| Cull et al[6] | PTL | 116 | 68 | 54 | 41 | — | 11 |
| Bhandari et al[9] | PTL | 49 | 85 | 82 | 35 | — | 0 |
| Korets et al[33] | PTL | 37 | 73 | 65 | 11 | — | 11 |
| Englesbe et al[34] | PTL | 30 | 41 | 26 | 27 | — | 3 |
| Khadra et al[35] | PTL | 74 | 74 | 63 | 16 | — | 3 |
| Tashjian et al[36] | PTL | 73 | 83 | 83 | 22 | — | 2 |
| Flarup et al[39] | MTL | 14 | 64 | 18 | 21 | — | 0 |
| Scott et al[40] | MTL | 46 | 68 | 43 | 21 | — | 13 |
| **AUTOGENOUS THIGH** | | | | | | | |
| Gradman et al[21] | FV transposition | 25 | 87 | 87 | 0 | 28 | 32 |
| Gradman et al[22] | FV transposition | 22 | 100 | 94 | 0 | 0 | 0 |
| Bourquelot et al[56] | FV transposition | 72 | 84 | 84 | 11 | 0 | 7 |
| **AUTOGENOUS UPPER EXTREMITY** | | | | | | | |
| Huber et al[11] | BA-Ax FV translocation | 30 | 100 | 100 | 0 | 40 | 27 |
| Elwakeel et al[13] | BA-BV transposition | 21 | 76 | 55 | 5 | 0 | 0 |
| Angle et al[14] | BA-BV transposition | 20 | — | — | — | — | 0 |
| Casey et al[15] | BA-BV transposition | 17 | 40 | 40 | — | — | — |
| Smith et al[53] | RA-AV translocation | 24 | 50 | 41 | 0 | 4 | 0 |
| Jennings et al[62] | BA-BV transposition | 58 | 92 | 92 | 0 | 0 | 2 |

# Cathéters tunnelisés



Journal of Advanced Pharmaceutical Technology & Research
(An official Publication of Society of Pharmaceutical Education & Research)



J Adv Pharm Technol Res. 2019 Apr-Jun; 10(2): 81–84.
doi: 10.4103/japtr.JAPTR_383_18
PMCID: PMC6474168
PMID: 31041187

# Patency and outcomes of tunneled hemodialysis catheter via femoral versus jugular vein access

Hosein Najd Sepas, Alireza Negahi,[1] Seyed Hamzeh Mousavie,[1] Fereshteh Vosough,[1] and Behnood Farazmand[1]

As the findings of the present study indicated, there was no difference between the two hemodialysis catheterization procedures, namely femoral and jugular catheter implantations, in terms of the mean patency and complications, such as infection, thrombosis, and mortality. Accordingly, the femoral and jugular access groups had the mean patency of 4.45 and 6.6 months, infection prevalence of 23.2% and 16.2%, thrombosis prevalence of 28.6% and 20.9%, and mortality rates of 3.5% and 1.4%, respectively. Furthermore, the history of catheter implantation and female gender were obtained as the predictors of reduced patency and catheter-related infection risk, respectively.

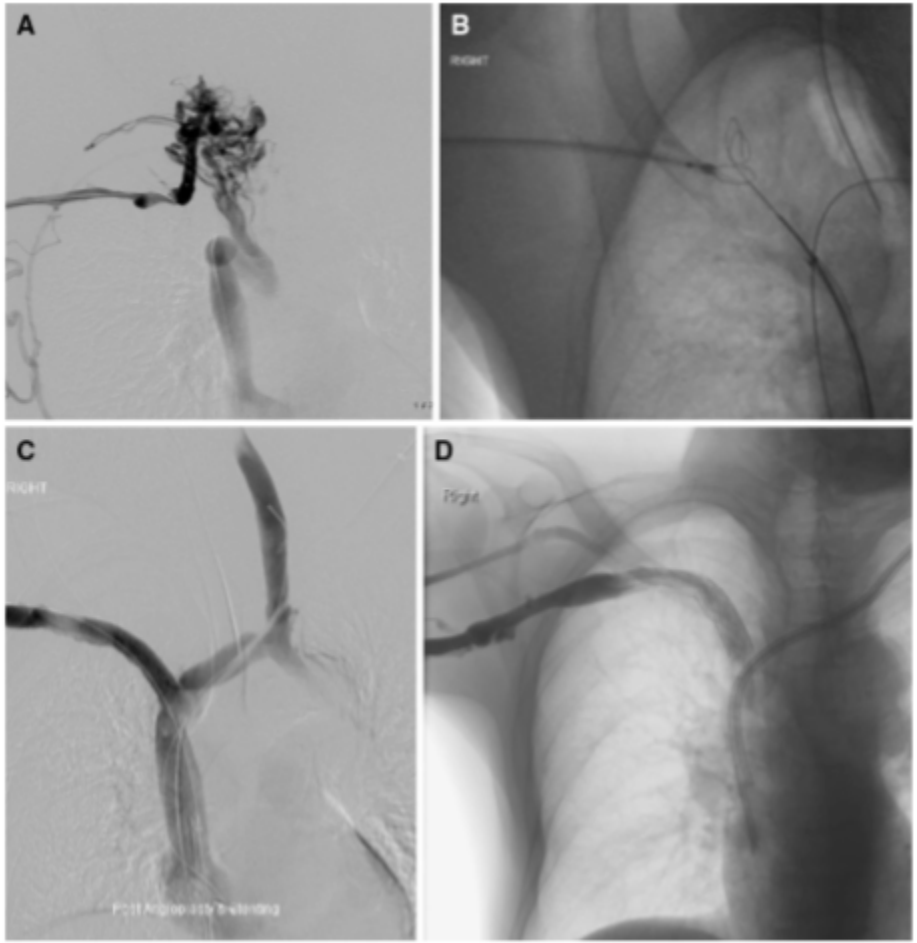
# Recanalisations des voies veineuses centrales

Cardiovasc Intervent Radiol (2016) 39:927–934
DOI 10.1007/s00270-015-1270-5

TECHNICAL NOTE

## Sharp Central Venous Recanalization in Hemodialysis Patients: A Single-Institution Experience

Mohammad Arabi[1] · Ishtiaq Ahmed[1] · Abdulaziz Mat'hami[1] · Dildar Ahmed[2] · Naveed Aslam[2]


A
B
C
D

# Procédures « exotiques »

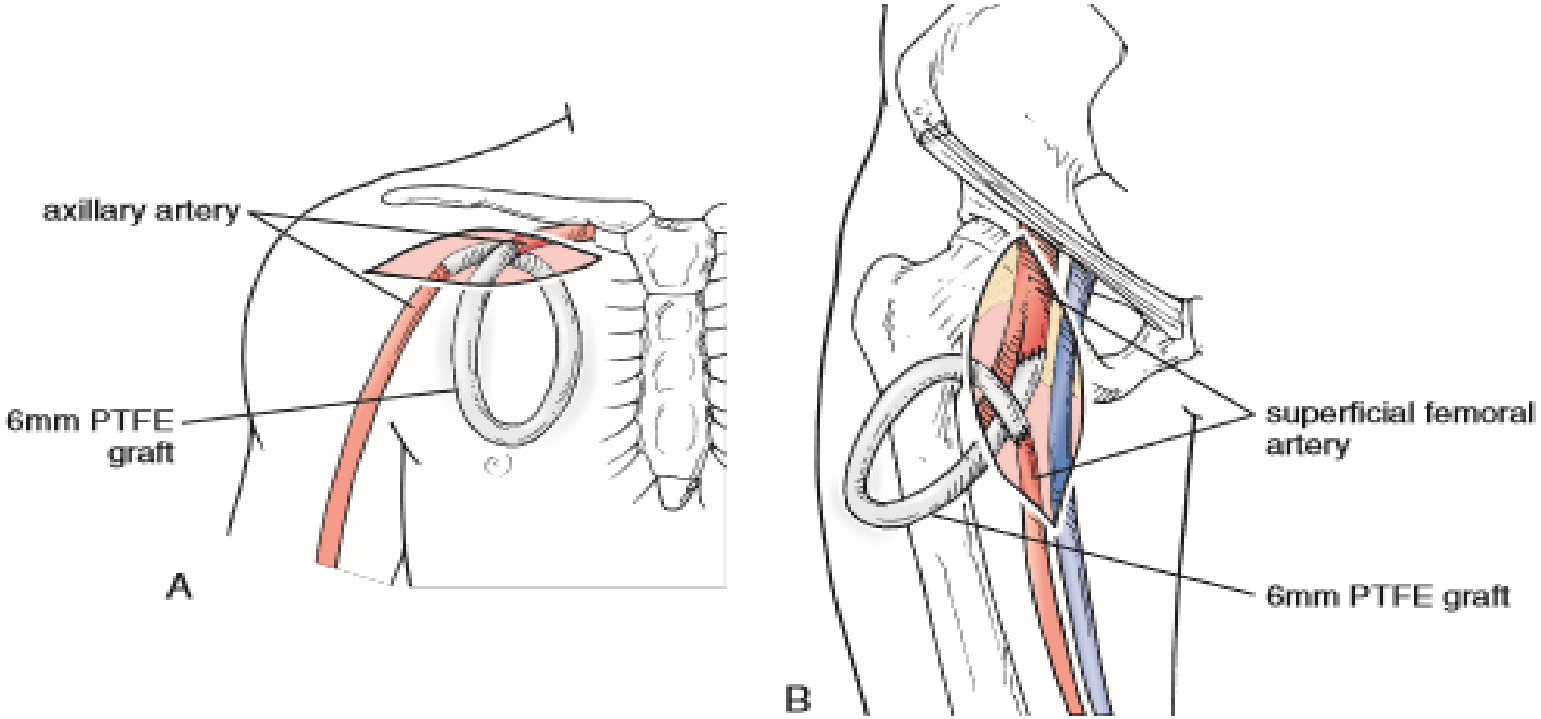
- **Pontages AV prothétiques thoraco-abdominaux**

  Accès direct sur l’auricule droit

  Pontage AV axillo- ou ilio-rénal

- **Loops artério-artériels**

# Procédures « exotiques »



# Cathéters tunnelisés « exotiques »

- **KT trans-thoracique → VCS**
- **KT trans-lombaire → VCI**
- **KT trans-hépatique → VCI**
- **KT → auricule droit via mini-thoracotomie antéro-droite**
- **KT → VCI via laparotomie**

# STRATEGIE ?

**Table 75-1** Major Complex Access Procedures: Indications, Relative Contraindications, and Anatomic Requirements

| Access Procedure | Specific Anatomic Requirements | Ideal Clinical Situation | Relative Contraindications |
|---|---|---|---|
| Autogenous femoral vein transposition | Patent femoral vein >3 mm in diameter<br>Patent, noncalcified superficial femoropopliteal artery | Pediatric or young, healthy patients<br>Patients who are hypercoagulable with no other autogenous access options<br>Patients at high risk for infection (poor hygiene, immunosuppressed, multiple previous access infections) | Significant obesity of the thigh<br>Patients who are elderly or "medically fragile"<br>Access sites for temporary catheter placement not readily available<br>Patients at high risk for access-related ischemia of the lower extremity |
| Prosthetic midthigh loop femoral-femoral access<br>Prosthetic loop femoral-femoral access | Patent femoral or common femoral vein<br>Patent, noncalcified superficial femoral artery (midthigh access) or common femoral artery | Patients who are elderly or have significant medical comorbidities | Patients at high risk for infection (poor hygiene, immunosuppressed, multiple previous access infections)<br>Patients who are morbidly obese |
| Prosthetic chest wall access | Patent axillosubclavian artery and vein<br>Patent central vein | Patients who are morbidly obese<br>Patients at high risk for access-related limb ischemia | Patients who are reasonable candidates for autogenous or prosthetic thigh access procedures |
| Tunneled dialysis catheter | Patent central vein | Patients who are "medically fragile" or have limited life expectancy (<6 mo)<br>Patients in whom all alternative access procedures have been expended | Patients who are candidates for an alternative complex access procedure (autogenous or prosthetic thigh or chest wall access) |
| Hemoaccess Reliable Outflow vascular access device | Guide wire access to a patent central vein<br>Brachial artery >3 mm | A central venous stenosis/occlusion that precludes upper extremity autogenous or prosthetic access options<br>Patients otherwise relegated to dialysis via a tunneled dialysis catheter | Active infection<br>Systolic blood pressure <100 mm Hg<br>Ejection fraction <20% |

# Take-home message

- Situations cliniques de plus en plus fréquentes
- Complexité variable selon l'anatomie mais toujours « **challenging cases** »
- Privilégier les accès natifs MI +++
- Cathéters tunnelisés : fin de vie ou « stand-by »