

Techniques de ponction de FAV

Des recommandations à la pratique...





EBPG on Vascular Access

Nephrol Dial Transplant (2007) 22



2006 Updates Clinical Practice Guidelines and Recommendations



Quand?

- 3.2 Maturation and cannulation of fistulae:
 - 3.2.1 A primary fistula should be mature, ready for cannulation with minimal risk for infiltration, and able to deliver the prescribed blood flow throughout the dialysis procedure. (See Table 3.) (B)
 - 3.2.2 Fistulae are more likely to be useable when they meet the Rule of 6s characteristics: flow greater than 600 mL/min, diameter at least 0.6 cm, no more than 0.6 cm deep, and discernible margins. (B)
 - 3.3 Cannulation of AVGs:

Grafts generally should not be cannulated for at least 2 weeks after placement (B)

Guideline 4.3. An autogenous fistula should be cannulated when adequate <u>maturation</u> has occurred (Evidence level III).

EBPG on Vascular Access

Nephrol Dial Transplant (2007) 22

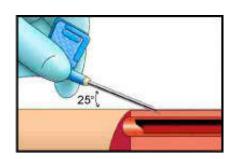


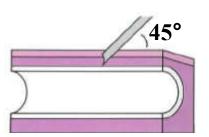




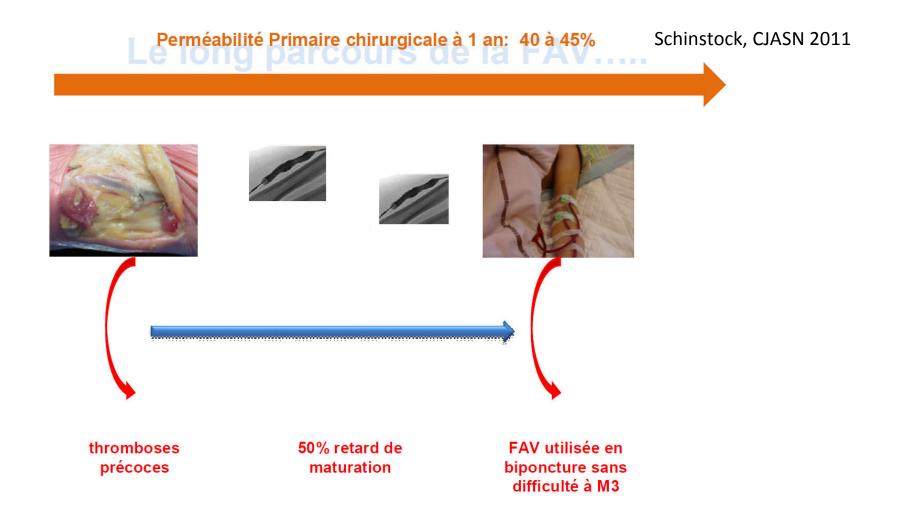
Comment?

- Piquer dans les sections droites
- Eviter les virages des vaisseaux
- Eviter de piquer dans le pli du coude
- Eviter de piquer les endroits où la peau est fragile
- S'abstenir de piquer dans les hématomes et anévrismes
- Ne pas piquer dans les anastomoses
- CHANGER les points de ponction
- 4-5cm entre les 2 aiguilles
- Aiguille veineuse vers l'épaule, aiguille artérielle à contre-courant ou dans le sens du retour veineux





Mais, dans la vraie vie...



Les techniques de ponctions, et notamment les premières ponctions, influencent la survie des abords vasculaires ?

Ponctions de FAV: quelques pistes pour améliorer leur survie

- Quand?
- Imagerie avant la première ponction?
- 1 ou 2 aiguilles?
- Taille d'aiguille?
- Débit pompe?
- Aiguille en métal ou en plastique?
- Direction de l'aiguille artérielle?
- Biseau vers le haut ou vers le bas?
- Ponction avec un garrot?
- Buttonehole ou rope ladder?
- Echo guidée?

Quand?

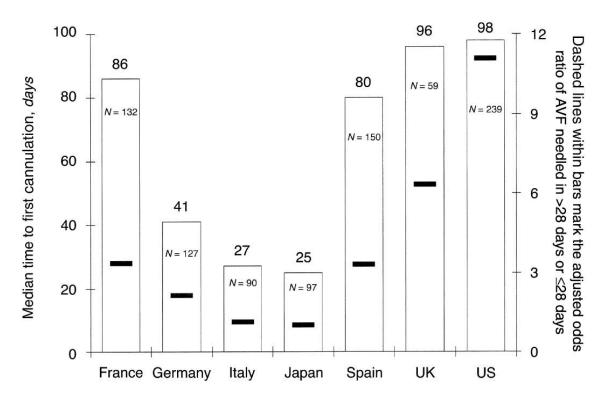
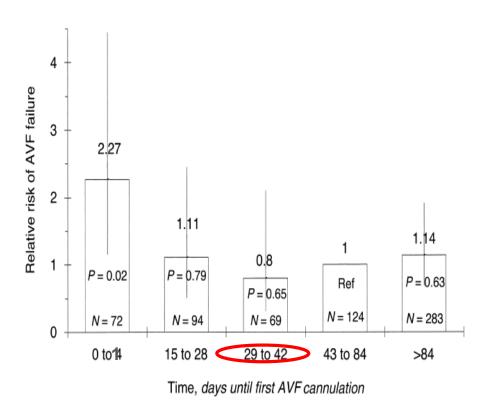
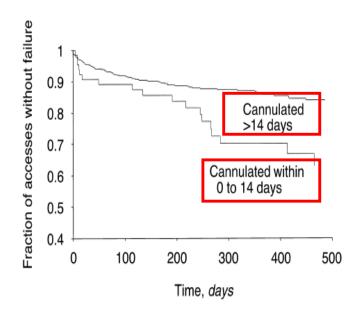


Fig. 5. Median time to first cannulation of A-V fistulae by country (bars), and adjusted odds ratio of an A-V fistula being cannulated ≤28 days versus >28 days after creation relative to Japan (dashed line within bar). The adjusted odds ratio for each country except Italy was significantly different from the adjusted odds for Japan (P < 0.05). Odds ratios are adjusted for age, gender, peripheral vascular disease, diabetes, dementia, depression, malnourishment, coronary heart disease, coronary artery disease, angina, pulmonary edema, COPD, dyspnea, pre-ESRD care, hospitalization within 3 months of study entry, arm location of A-V fistula placement, and were limited to A-V fistulae in which cannulation time was ≤730 days. All results relate to cannulation of A-V fistulae used by incident patients when starting HD: N = 694.

Quand?





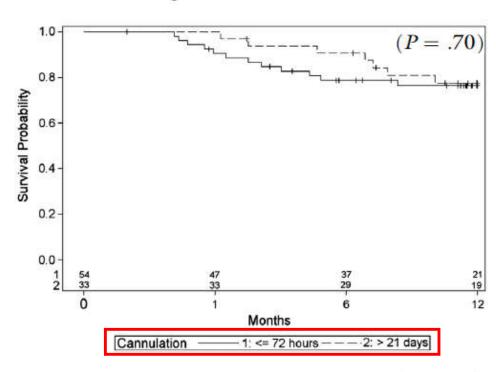
Quand?

Clin Kidney J (2015) 8: 290–292 doi: 10.1093/ckj/sfu146 Advance Access publication 20 January 2015

Original Article



Timing of cannulation of arteriovenous grafts: are we too cautious?



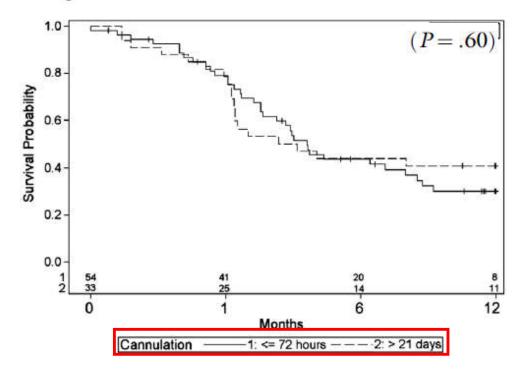


Fig 4. Kaplan-Meier curve showing cumulative graft patency for up to 12 months in patients in whom the graft was first cannulated either ≤72 hours or >21 days after implantation. Patients who

Fig 5. Kaplan-Meier curve showing primary unassisted graft patency for up to 12 months in patients in whom the graft was first cannulated either ≤72 hours or >21 days after implantation.



Nephrol Dial Transplant (2019)

Quand?

AV fistulas

In adults requiring haemodialysis, we suggest arteriovenous fistulas can be cannulated 4 weeks after creation if they are considered suitable for cannulation on clinical examination. (2C)

In adults requiring haemodialysis, we recommend against cannulating arteriovenous fistulas sooner than 2 weeks after their creation. (1B)

In adults requiring haemodialysis, we suggest against cannulating arteriovenous fistulas 2–4 weeks after their creation unless this will avoid placement of a central venous catheter for haemodialysis. (2C)

AV grafts

In adults requiring haemodialysis, we recommend 'early cannulation type' arteriovenous grafts can be cannulated as soon as wound healing permits. (1B)

In adults requiring haemodialysis, we suggest against cannulating a 'standard type' arteriovenous graft sooner than 2 weeks after insertion unless this will avoid placement of a central venous catheter for haemodialysis. (2B)

Imagerie avant les premières ponctions?

- <u>Fistulographie systématique</u> 4-6 semaines après création FAV et avant premières ponctions:
- Pas de sténose: 40%
- Sténose modérée (<50%):28%
- Sténoses sévères nécessitant ATL ou reprise chirurgicale: 31%

Lee, j Vasc Interv radiol, 2013

- 1 mois après chirurgie, facteurs prédictifs de maturation de la FAV:
- Examen clinique (VPP= 81%)
- Diamètre veine> 5mm au doppler (VPP= 90%)

Imagerie avant les premières ponctions?

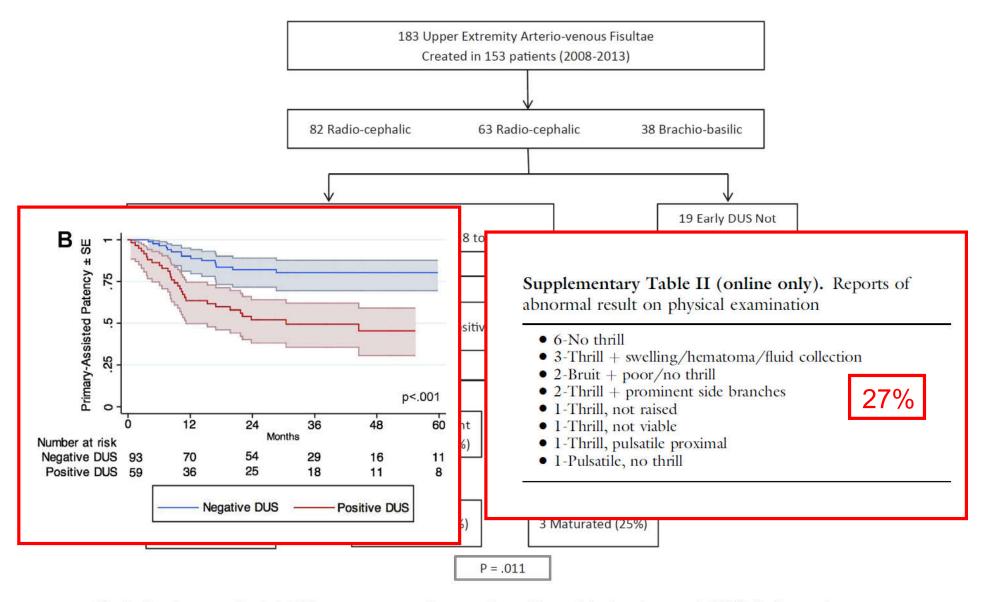


Fig 2. Arteriovenous fistula (AVF) outcomes according to early positive and duplex ultrasound (DUS) findings and interventions.



1 ou 2 aiguilles?



- 6 premières séances en aiguille unique (vs 2 aiguilles)
- •<u>Objectif</u>: nbre cathéter, fistulographie et séances « sautées » pendant <u>3 premiers mois</u>

	1 aiguille n=22	2 aiguilles n=11
Pose cathéter	2 (9.1%)	2 (18%)
Fistulographie	3 (13.6%)	4(36.4%)
Saut de séance	11 (1.3%)	8 (1.8%)



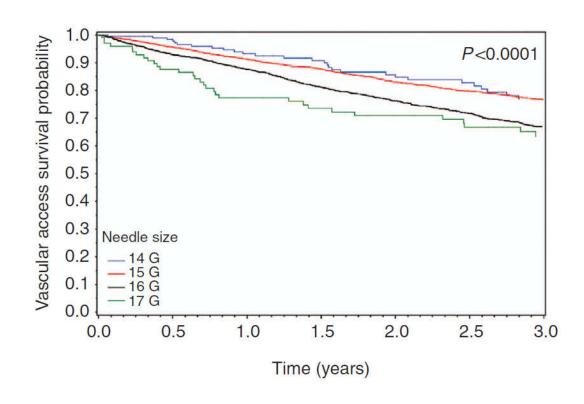
Quelle taille d'aiguilles? 1ères séances



Small gauge needles (17G) are recommended for at least the first few cannulations of a new fistula.

Quelle taille d' aiguilles? Au long cours





Parameter	Category	Reference	HR	95%	CI	P-value
Needle size	14 G	15 G	1.25	0.85	1.83	0.26
	16 G		1.21	1.07	1.38	0.003
	17 G		1.42	0.93	2.17	0.11

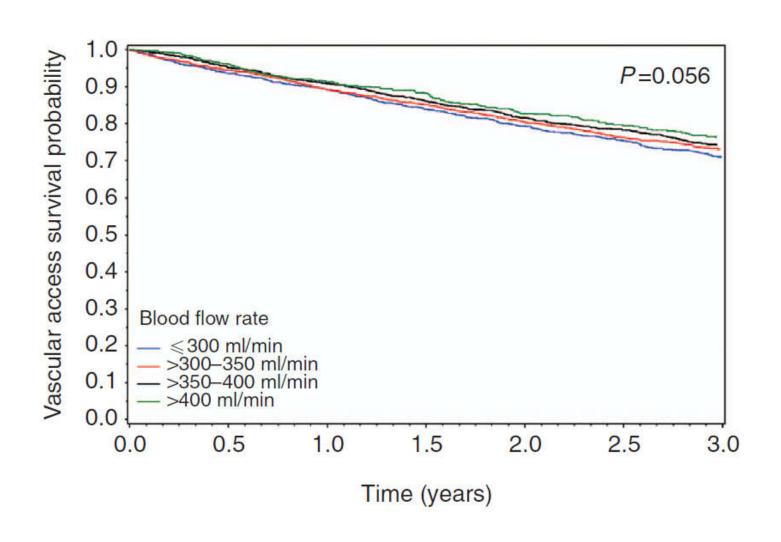




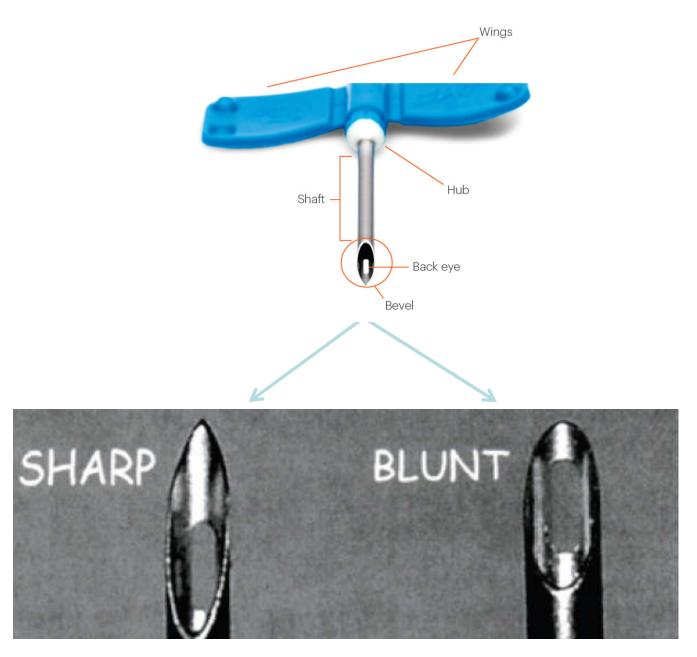
Table 1. Matching gauge and blood flow rate

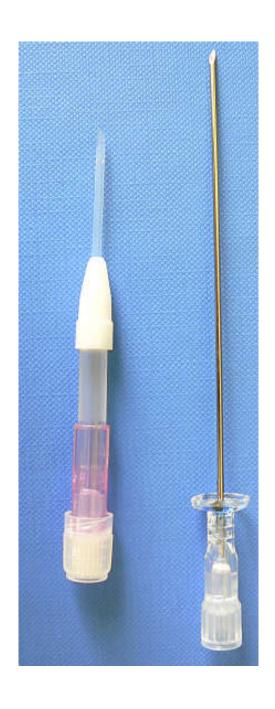
Blood flow rate (BFR)	Recommended needle gauge
<300 ml/min	17 gauge
300-350 ml/min	16 gauge
>350-450 ml/min	15 gauge
>450 ml/min	14 gauge

Quel débit pompe à sang?



Aiguille «métal» ou «plastique »?







Use of Plastic Needles for Early Arteriovenous Fistula Cannulation

Krzysztof Letachowicz^a Mariusz Kusztal^a Tomasz Gołębiowski^a

- Etude rétrospective, 1ères ponctions (uni) pendant 1 mois
- Cathlons (n= 20) vs aiguilles en métal (n=19)

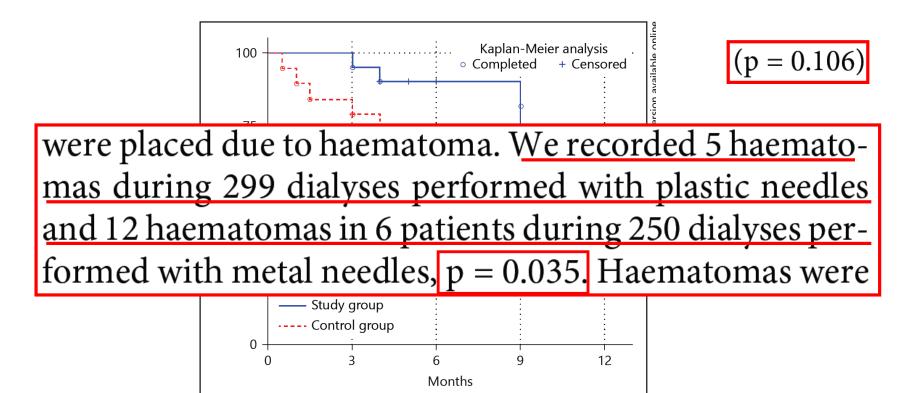


Fig. 3. Estimated primary functional patency of AVFs cannulised with plastic (study group) and metal (control group) needle within first month of use.



Randomized pilot study to compare metal needles versus plastic cannulae in the development of complications in hemodialysis access

The Journal of Vascular Access 2018, Vol. 19(3) 272–282 © The Author(s) 2018



Reprints and permissions:

sagepub.co.uk/journalsPermissions.nav DOI: 10.1177/1129729817747535

ournals.sagepub.com/home/jva



Rosa M Marticorena^{1,2,3}, Niki Dacouris² and Sandra M Donnelly^{3,4,5}

Number of clinical complications ^b	Metal (n = 17)	Plastic (n = I6)	Þ
Total complications	18 (1.06±0.66)	7 (0.44±0.51)	0.005
Blood extravasation during cannulation	4 (0.24 ± 0.56)	2 (0.13±0.34)	0.50
Infiltration during HD with HD short/loss	$14 (0.82 \pm 0.64)$	$5(0.31 \pm 0.48)$	0.014
Infiltration during HD with treatment loss	$2(0.12\pm0.33)$	0 (0)	0.16

Costs estimates	Metal (n = 17)	Plastic (n = 16)
Total HD treatments	1966	2269
Mean duration of follow-up (months)	8.9	10.9
Cost of cannulation device	CAD\$3932	CAD\$13,776
Estimated cost of procedures	CAD\$55,000	CAD\$27,500
Total cost per study period	CAD\$58,932	CAD\$41,276
Estimated cost/patient-month	CAD\$6622	CAD\$3787



Nephrol Dial Transplant (2019)

Aiguille «métal» ou «plastique »?

Recommendations

We suggest using either sharp needles or plastic cannulas for cannulating arteriovenous fistulas in adults treated with haemodialysis. (2C)

We recommend using blunt needles only for buttonhole cannulation of arteriovenous fistulas in adults treated with haemodialysis. (1D)

Direction de l'aiguille artérielle?

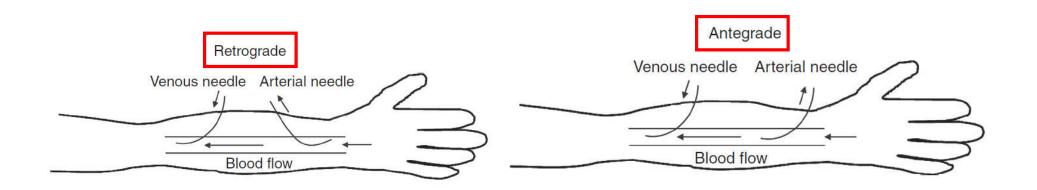


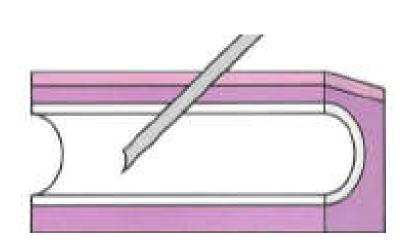
Table 1.	Results of antegrade and retrograde cannulation.	
----------	--	--

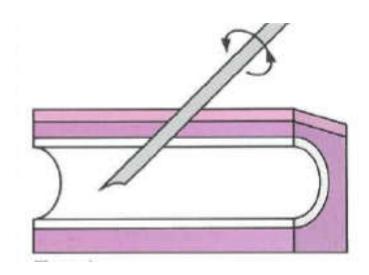
	Retrograde	Antegrade	р
Pre-HD Urea (mg/dl)	142 ± 24	154 ± 37	ns
Post-HD Urea (mg/dl)	37 ± 11	41 ± 10	ns
URR (%)	74.2 ± 7.2	73.0 ± 8.7	ns
sKt/V	1.75 ± 0.37	1.74 ± 0.40	ns
eKt/V	1.57 ± 0.33	1.57 ± 0.35	ns

No aneurysm, thrombosis, and stenosis were detected on Doppler US and no cannulation complication was observed during the study period for both directions of cannulation.

Ozmen et al, clin Nephrol, 2008

Biseau vers le haut ou vers le bas?

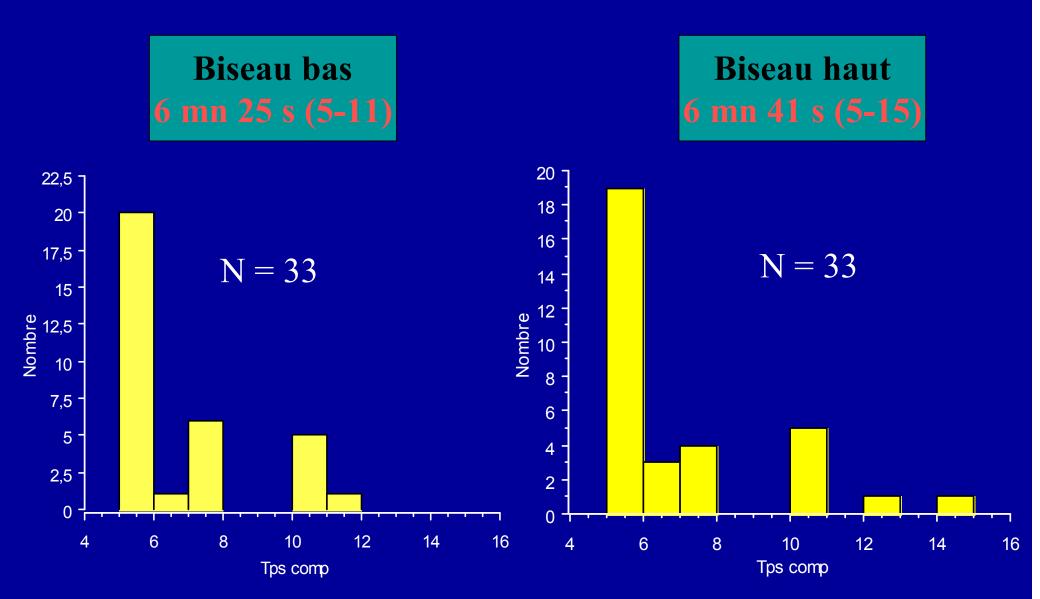




Parameter	Category	Reference	HR	95%	CI	P-value
Bevel and needle direction	Antegrade + bevel down	${\sf Antegrade} + $	0.97	0.82	1.14	0.71
	Retrograde + bevel up	bevel up	0.93	0.81	1.07	0.32
	Retrograde + bevel down		1.18	1.01	1.37	0.04

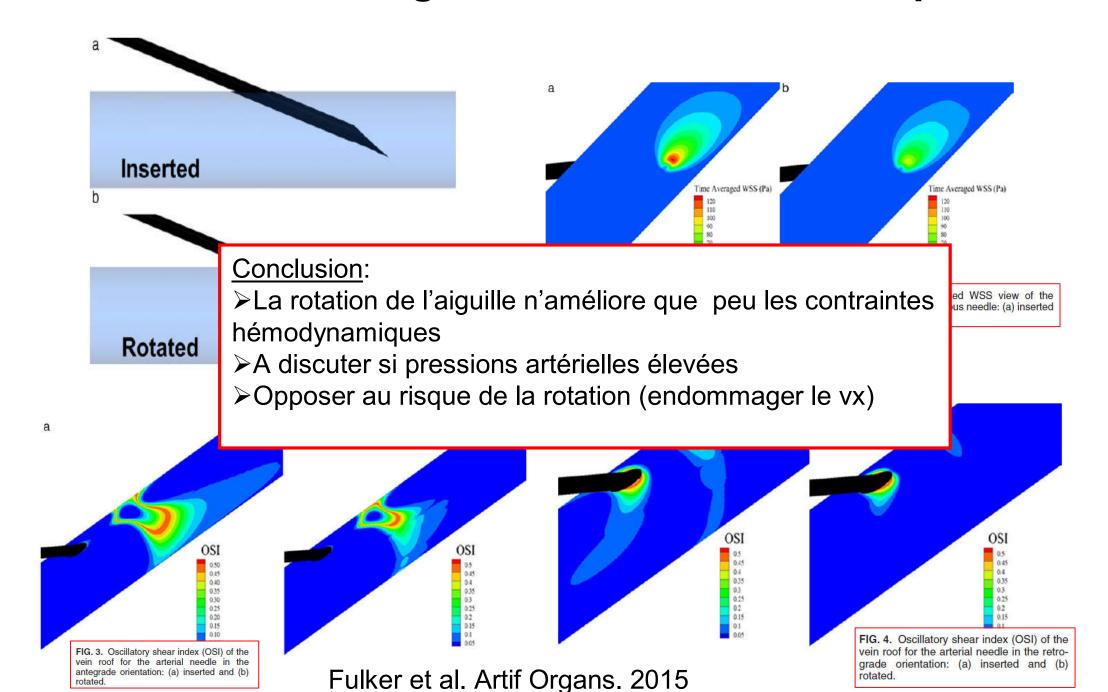
Needle rotation did not affect the access survival (P = 0.81)

Résultats temps de compression



Données non publiées, CHU Rouen

Position des aiguilles: modèle informatique



J Vasc Access 2017; 18 (2): 114-119 DOI: 10.5301/jva.5000617

ORIGINAL RESEARCH ARTICLE



Elements of dialysis nursing practice associated with successful cannulation: result of an international survey

Maria Teresa Parisotto, Francesco Pelliccia, Aileen Grassmann, Daniele Marcelli

TABLE II - Results of the logistic regression model evaluating nursing practice aspects in respect to the event "cannulation complication"

Nursing	Nursing practice aspect		Odds ratio 95% o		6 confidence interval	
Variable	Reference	Category		Lower limit	Higher limit	
Needle gauge	15	14	0.545	0.199	1.491	NS
		16	1.305	1.016	1.676	0.037
		17	4.245	2.548	7.072	<0.001
Back-eye needle	No	Yes	1.879	1.409	2.508	< 0.001
Cannulation technique	Rope-ladder	Buttonhole	0.559	0.332	0.942	0.029
		Area	0.613	0.482	0.780	<0.001
1st needle inserted	Arterial	Venous	1.677	1.306	2.155	<0.001
Needle axis rotation	No	Yes	1.522	1.206	1.921	<0.001
Needle fixation	Butterfly	Chevron	0.836	0.474	1.475	NS
		U-shape	0.754	0.461	1.232	NS
		Others	0.561	0.347	0.905	0.018







doi: 10.1093/ckj/sfaa098 Advance Access Publication Date: 2 October 2020 Original Article

ORIGINAL ARTICLE

Vascular access cannulation and haemostasis: a national observational study of French practices

Marion Sallée^{1,2}, Lucile Mercadal³, Guillaume Jean⁴, Bruno Guery⁵, Didier Borniche⁶, Jan-Marc Charrel⁷, Thierry Hannedouche⁸, Frank Le Roy⁹ and Philippe Brunet^{1,2}

Methods. The study (sponsored by Brothier Pharmaceutical Inc.) was conducted in 150 dialysis units. Data obtained from 150 supervisory nurses, 1538 nurses and 3588 patients with an AVF were analysed.

Table 1. Characteristics of the renal dialysis units

Renal dialysis unit	Study data	National data		
Administrative status (%)				
Public unit	50.0	46.5		
Private unit	31.0	36.5		
Association unit ^b	19.0	17.0		
Type of units (%)				
Haemodialysis centre ^c	51.0	47.0		
Unit with medical supervision ^d	31.0	34.0		
Self-care dialysis unit ^e	18.0	16.0		







doi: 10.1093/ckj/sfaa098 Advance Access Publication Date: 2 October 2020 Original Article

ORIGINAL ARTICLE

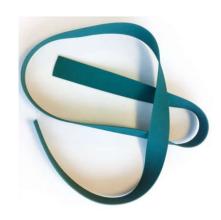
Vascular access cannulation and haemostasis: a national observational study of French practices

Marion Sallée^{1,2}, Lucile Mercadal³, Guillaume Jean⁴, Bruno Guery⁵, Didier Borniche⁶, Jan-Marc Charrel⁷, Thierry Hannedouche⁸, Frank Le Roy⁹ and Philippe Brunet^{1,2}

Table 2. Puncture needles and techniques (most frequently used)

	N	1538
Needle type	Missing or deleted data $(n = 16)^a$	39
1000 C	Rigid metal needles	964 (64.3)
	Blunt needles	12 (0.8)
	Fistula catheters	523 (34.9)
Needle size	Missing or deleted data $(n = 239)^a$	244
	14 G	99 (7.6)
	15 G	472 (36.5)
	16 G	613 (47.4)
	17 G	109 (8.4)
	18 G	1 (0.1)
Technique	Missing or deleted data $(n = 74)^a$	82
	Rope-ladder	984 (67.6)
	Area	384 (26.4)
	Buttonhole	88 (6.0)
Bevel position	Missing or deleted data (n = 6) ^a	9
and rotation	Upon introduction: upwards	797 (55.6)
of needles ^b	downwards	637 (44.4)
	Missing data	14
	180-degree rotation	614 (43.0)
	Missing data	22
	During dialysis: upwards	446 (31.4)
	downwards	975 (68.6)

Faut-il faire un garrot pour la ponction?



Parameter	Category	Reference	HR		6 CI	<i>P</i> -value	
Arm compression at the time of cannulation	None	Patient	1.25	1.04	1.49	0.02	
,	Tourniquet	assistance	1.30	1.07	1.58	0.008	

EBPG on Vascular Access

Nephrol Dial Transplant (2007) 22





Buttonehole ou rope ladder?







those with only a short vein segment available for needling, the buttonhole method is preferred over area puncture.

Guideline 4.4. The rope ladder technique should be used for cannulation of grafts (Evidence level III).

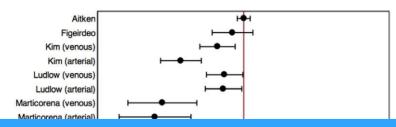
Buttonhole Versus Rope-Ladder Cannulation of Arteriovenous Fistulas for Hemodialysis: A Systematic Review

Am J Kidney Dis. 64(6):918-936.

Ben Wong, MD, Maliha Muneer, BSc, Natasha Wiebe, MMath, Dale Storie, MA, Dale Storie, MA,

Con: Buttonhole cannulation of arteriovenous fistulae

Annie-Claire Nadeau-Fredette^{1,2} and David W. Johnson^{1,3} Nephrol Dial Transplant (2016) 31: 525–528



Critères secondaires:

- ➤ Survie primaire et assistée: idem
- ➤ Formation anévrysme: en faveur BH
- ➤ Hématome: idem
- ➤Infection: en faveur du RL
- >Temps de compression ablation aiguilles: en faveur BH

	Buttor	nhole	Rope L	adder						
Study or Subgroup	Events	Total	Events	Total	Weight	Risk Ratio, 95% CI		Risk Rat	io, 95% CI	
MacRae 2012	68	3873	37	3855	94.6%	1.83 [1.23, 2.72]			-	
Toma 2003	1	3330	0	3870	1.5%	3.49 [0.14, 85.55]				_
Vaux 2013	2	16667	2	22222	3.9%	1.33 [0.19, 9.46]		-	•	
Total (95% CI)		23870		29947	100.0%	1.82 [1.24, 2.69]			•	
Total events	71		39							
Heterogeneity. $Tau^2 = 0.00$; $Chi^2 = 0.26$, $df = 2$ (P = 0.88); $I^2 = 0$ %					88); $I^2 = 0\%$		- 01		15	100
Test for overall effect			CONTROL OF THE PARTY OF THE PAR	•			0.01	Favours [buttonhole]	Favours [rope ladder]	100

FIGURE 1: Effect of buttonhole versus rope-ladder cannulation on total infection rates (local and/or systemic infectious episodes per days at risk) in patients with end-stage kidney disease receiving maintenance haemodialysis.

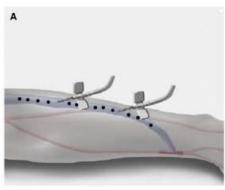


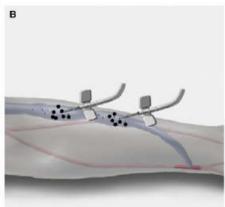
Buttonehole ou rope ladder?

Recommendations

We suggest against using the area technique for cannulating arteriovenous fistulas in adults treated with haemodialysis. (2D)

We suggest using either a rope-ladder or buttonhole technique for cannulating arteriovenous fistulas in adults treated with haemodialysis and letting the choice be dependent on local expertise and arteriovenous fistula characteristics. (2D)





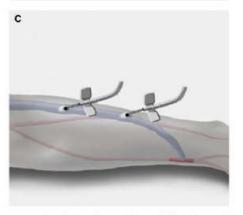


FIGURE 1: Cannulation techniques: (A) rope-ladder technique, (B) area technique and (C) buttonhole technique. Reprinted from Schmidli et al. [33], with permission from Elsevier.







doi: 10.1093/ckj/sfaa098 Advance Access Publication Date: 2 October 2020 Original Article

ORIGINAL ARTICLE

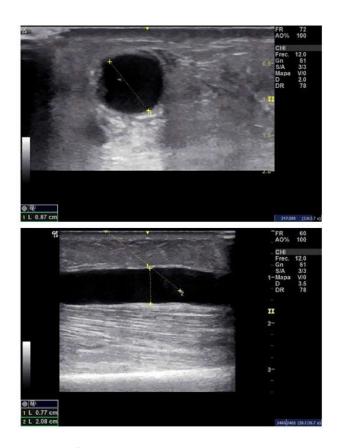
Vascular access cannulation and haemostasis: a national observational study of French practices

Marion Sallée^{1,2}, Lucile Mercadal³, Guillaume Jean⁴, Bruno Guery⁵, Didier Borniche⁶, Jan-Marc Charrel⁷, Thierry Hannedouche⁸, Frank Le Roy⁹ and Philippe Brunet^{1,2}

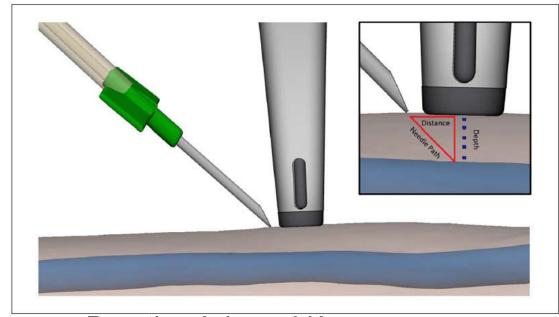
Table 2. Puncture needles and techniques (most frequently used)

	N	1538
Needle type	Missing or deleted data $(n = 16)^a$	39
2000 00 ann ann ann ann ann ann ann ann a	Rigid metal needles	964 (64.3)
	Blunt needles	12 (0.8)
	Fistula catheters	523 (34.9)
Needle size	Missing or deleted data $(n = 239)^a$	244
	14 G	99 (7.6)
	15 G	472 (36.5)
	16 G	613 (47.4)
	17 G	109 (8.4)
	18 G	1 (0.1)
Technique	Missing or deleted data (n = 74)a	82
-	Rope-ladder	984 (67.6)
	Area	384 (26.4)
	Buttonhole	88 (6.0)
Paval position	Missing or deleted data (n. 6)8	0
Bevel position	Missing or deleted data $(n = 6)^a$	9
and rotation	Upon introduction: upwards	797 (55.6)
of needles ^b	downwards	637 (44.4)
	Missing data	14
	180-degree rotation	614 (43.0)
	Missing data	22
	During dialysis: upwards	446 (31.4)
	downwards	975 (68.6)

ponctions écho-guidée?



Écho repérage



Ponction écho-guidée













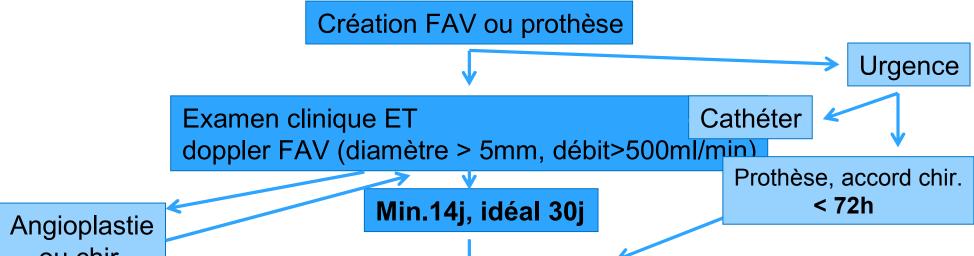
Echo-guidage?

A randomised clinical trial of ultrasound guided cannulation of difficult fistulae for dialysis access

32 patients ayant eu 346 cannulations (170 sous échographie, 176 sans)

- > Réduction tentatives sous échographie
- Durée de procédure plus longue sous échographie
- Pas de différence pour la douleur ou les complications

Eves, J Vasc Access 2021



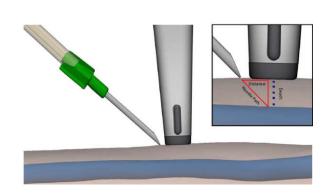
ou chir.

6 séances en unipuncture

- ➤ Soit 17G
- ➤ Soit cathlon
- > Retour cathéter si présent
- ➤ Compression manuelle par IDE 20 minutes

Puis bi-puncture

- ≥14 ou 15G
- ➤ Garrot par IDE ou patient
- ➤ Aiguille artérielle antérograde
- ➤ Biseau vers le haut
- ➤ Débit pompe> 300ml/min
- ➤ Technique rope ladder
- ➤ Compression par IDE ou patient



Buttonhole:

- -FAV profondes, courtes, sinueuses
- -Difficultés récurrentes de ponction
- -Expérience du centre

Merci de votre attention