Quand et comment ponctionner un abord vasculaire?

Des recommandations à la pratique…

Centre Hospitalier du Pays d'Aix

G. Lebrun, Aix-en-Provence
SFAV, 13 juin 2015

Caractéristiques d’un abord vasculaire idéal

- Longue survie
- Prêt pour le démarrage de la dialyse
- Débit suffisant mais pas trop élevé
- Confort de position pendant la dialyse
- Temps de compression courts
- PONCTIONNABLE PAR TOUS

EBPG on Vascular Access

Nephrol Dial Transplant (2007) 22 [Suppl 2]: ii88–ii117

NDT Nephrology Dialysis Transplantation

2006 Updates
Clinical Practice Guidelines
and Recommendations

KDOQI

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 and not until swelling has subsided so that palpation of the

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

EBPG on Vascular Access

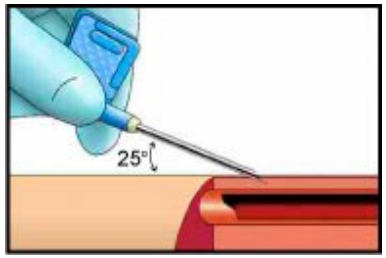
Nephrol Dial Transplant (2007) 22 [Suppl 2]: ii88–ii117

NDT Nephrology Dialysis Transplantation

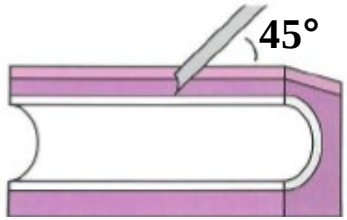
2006 Updates Clinical Practice Guidelines and Recommendations

KDOQI

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

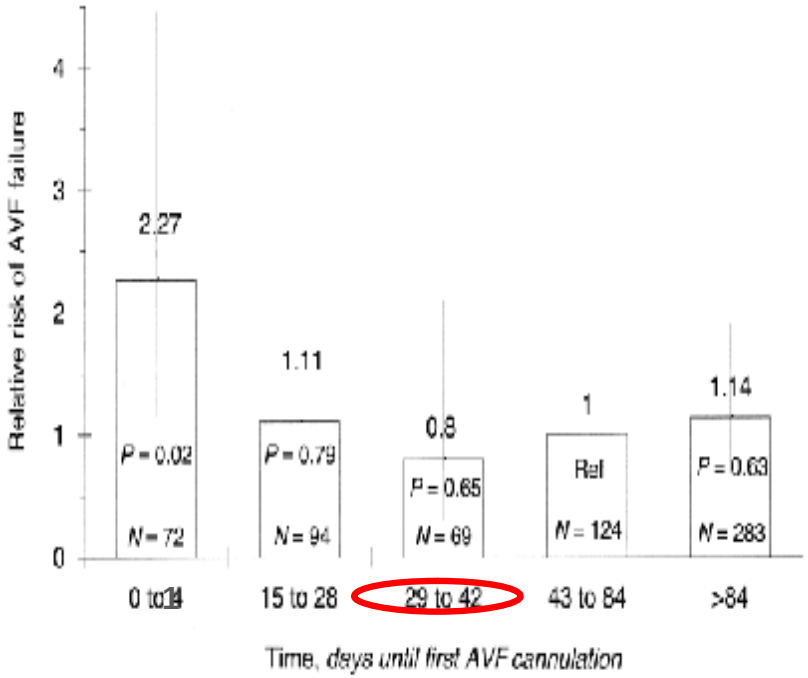


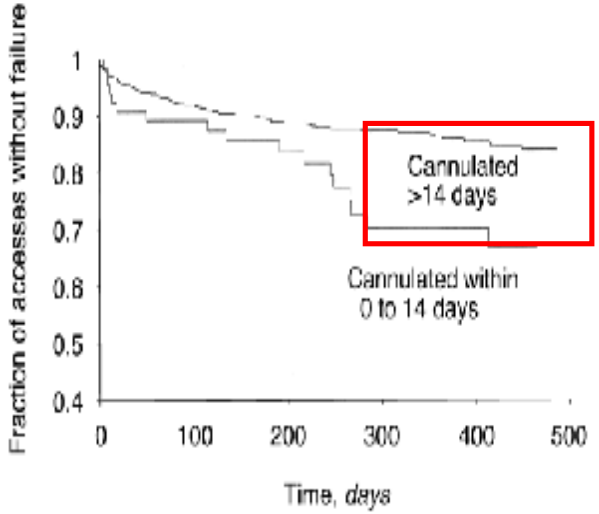
- 4-5cm entre les 2 aiguilles
- Aiguille veineuse vers l'épaule, aiguille artérielle à contre-courant ou dans le sens du retour veineux

Ponctions de FAV:
quelques pistes pour améliorer leur survie

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

Quand?





DOPPS, KI, 2003

Quand?

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

Original Article

ckj

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

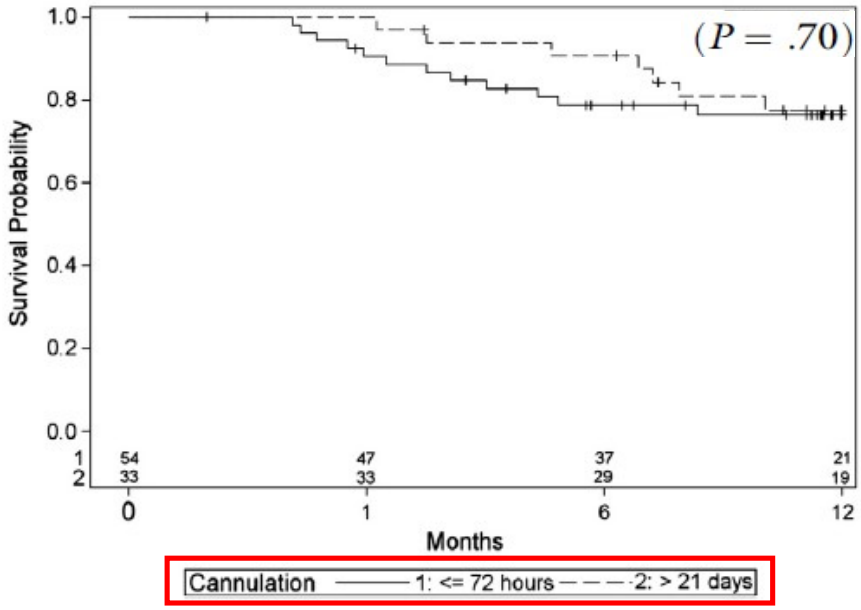


Fig 4. Kaplan-Meier curve showing cumulative graft patency for up to 12 months in patients in whom the graft was first cannulated either ≤72 hours or >21 days after implantation. Patients who

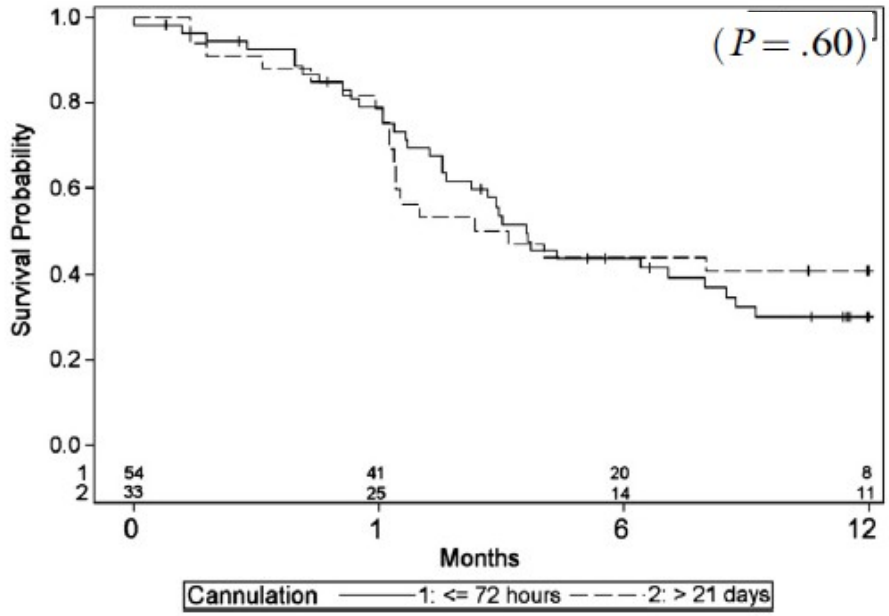


Fig 5. Kaplan-Meier curve showing primary unassisted graft patency for up to 12 months in patients in whom the graft was first cannulated either ≤72 hours or >21 days after implantation.

Glickman et al. J Vasc Surgery, 2015

Imagerie avant les premières ponctions?

- Fistulographie systématique 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%)

Ferring, j Vasc Access, 2014

Premières ponctions écho-guidée?

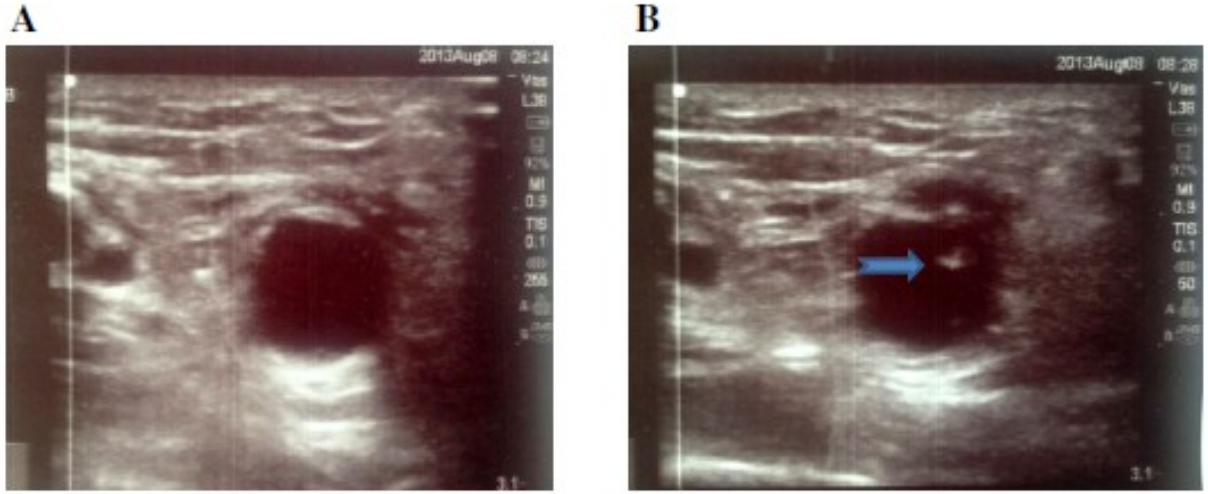
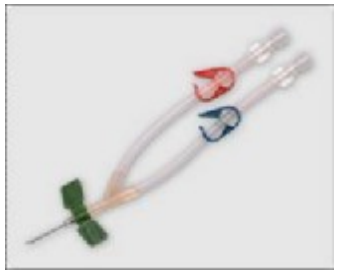


FIG. 1. (A) Ultrasound image before cannulation showing venous tract of AVF which is 1 cm deep. (B) Ultrasound image after cannulation with needle tip in vein without any hematoma.

Patle et al. Semin Dial, 2015



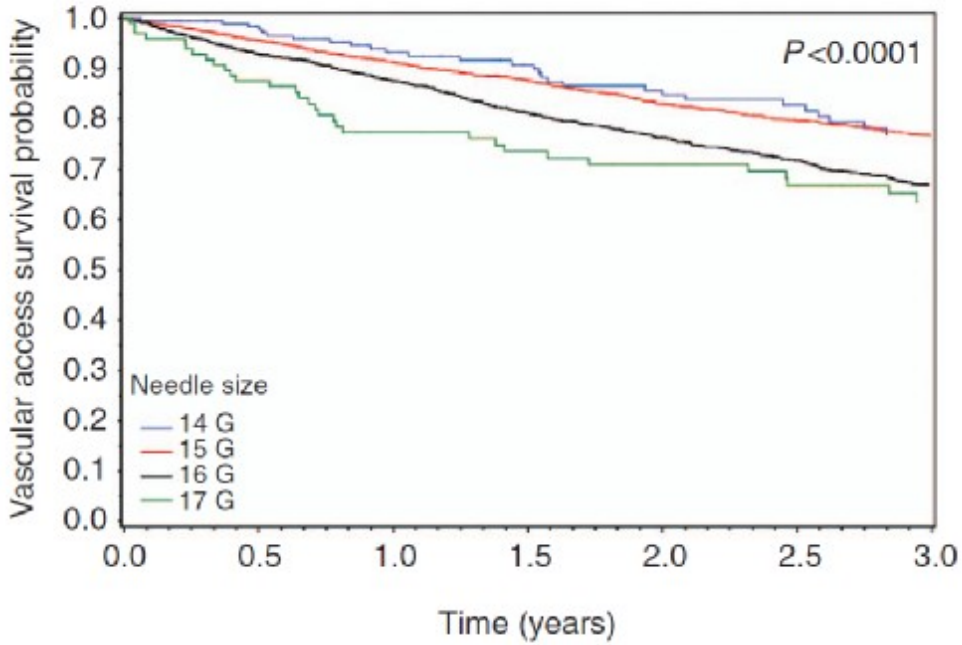
1 ou 2 aiguilles?

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

	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%)

Wilson et al, CANNT J, 2009

Quelle taille d’ aiguilles?



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

Parisotto et al, Kidney Int, 2014

Direction de l'aiguille artérielle?

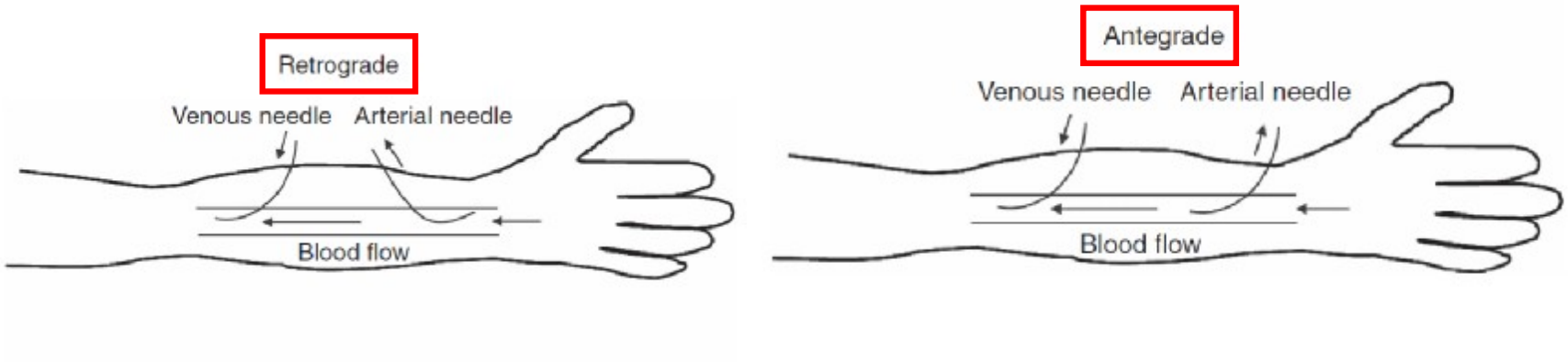


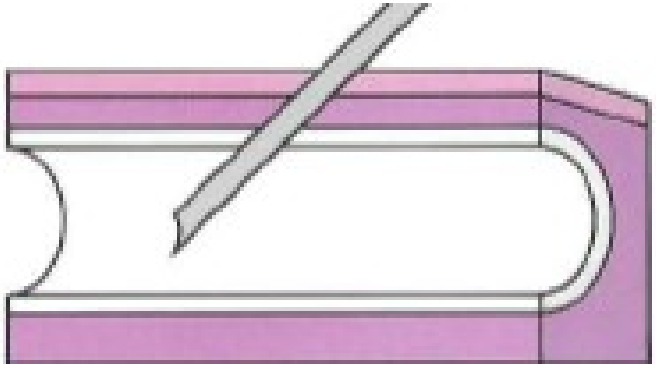
Table 1. Results of antegrade and retrograde cannulation.

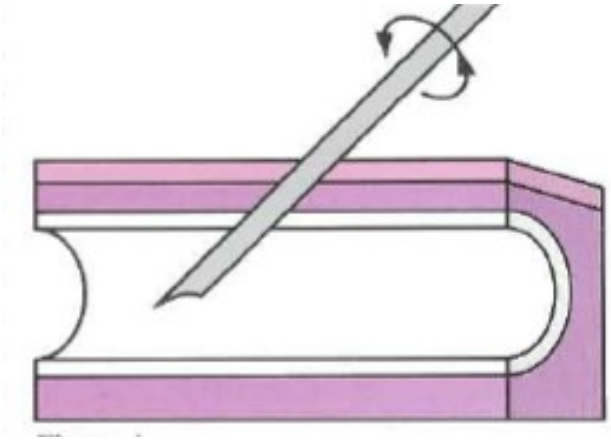
	Retrograde	Antegrade	p
Pre-HD Urea (mg/dl)	142 ± 24	154 ± 37	ns
Post-HD Urea (mg/dl)	37 ± 11	41 ± 10	ns
URR (%)	74.2 ± 7.2	73.0 ± 8.7	ns
sKt/V	1.75 ± 0.37	1.74 ± 0.40	ns
eKt/V	1.57 ± 0.33	1.57 ± 0.35	ns

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?





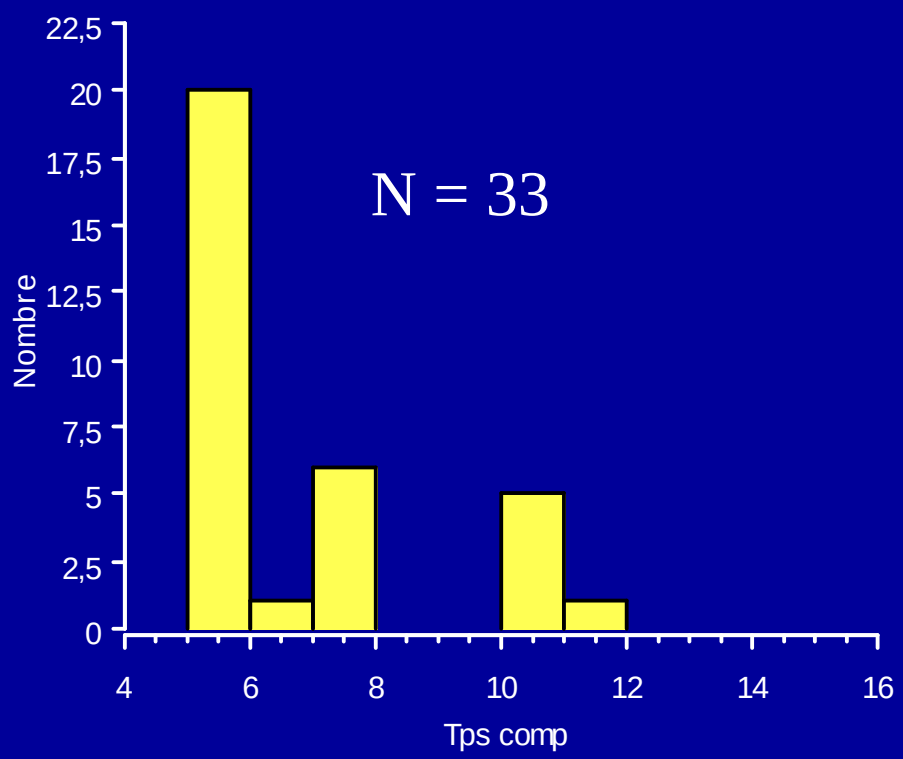
Parameter	Category	Reference	HR	95% CI		*P*-value
Bevel and needle direction	Antegrade + bevel down	Antegrade + bevel up	0.97	0.82	1.14	0.71
	Retrograde + bevel up		0.93	0.81	1.07	0.32
	Retrograde + bevel down		1.18	1.01	1.37	0.04

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

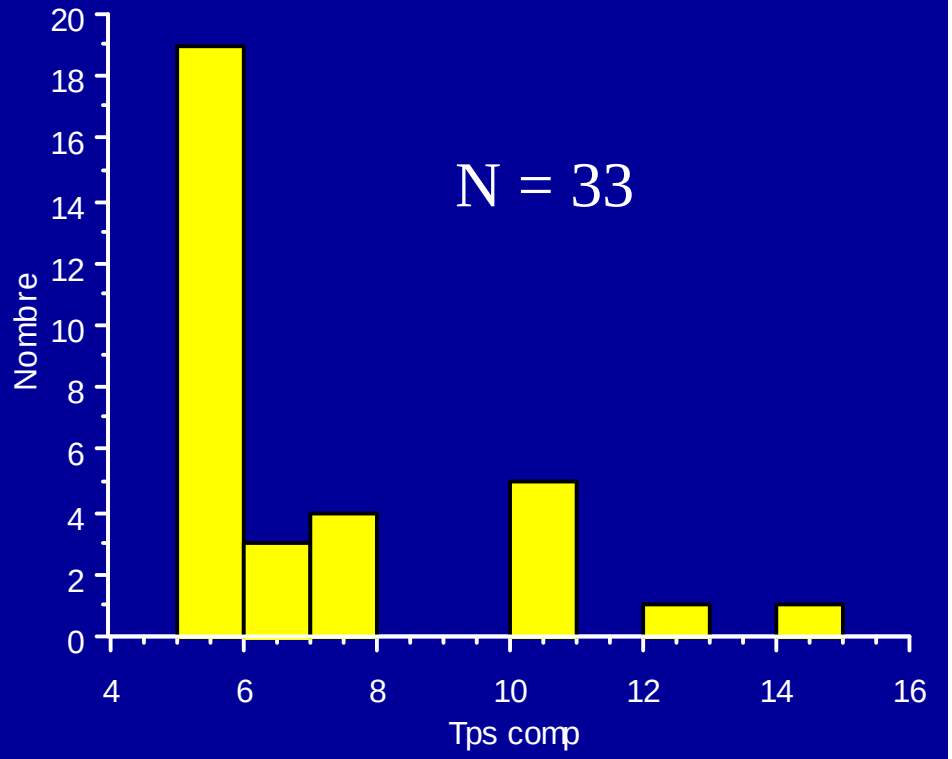
Parisotto et al, Kidney Int, 2014

Résultats temps de compression

Biseau bas
6 mn 25 s (5-11)

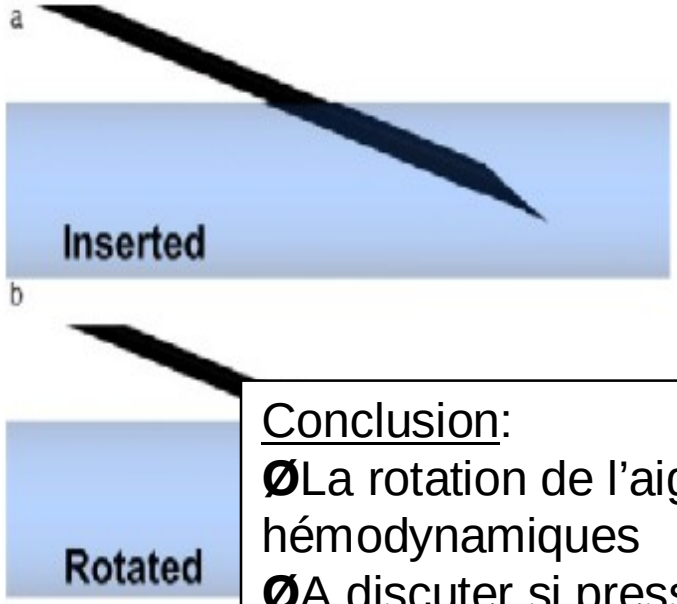


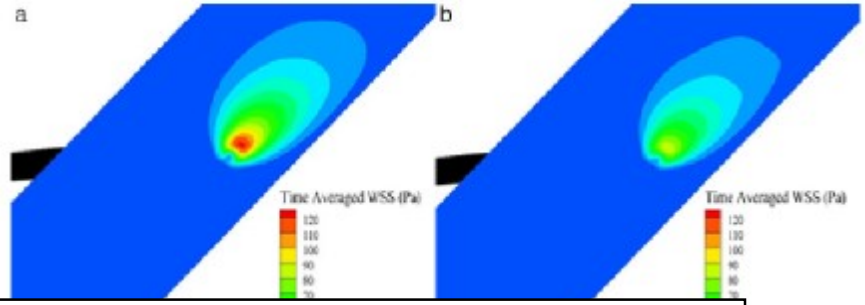
Biseau haut
6 mn 41 s (5-15)



Données non publiées, CHU Rouen

Position des aiguilles: modèle informatique





ed WSS view of the
us needle: (a) inserted

Conclusion:

- La rotation de l'aiguille n'améliore que peu les contraintes hémodynamiques
- A discuter si pressions artérielles élevées
- Opposer au risque de la rotation (endommager le vx)

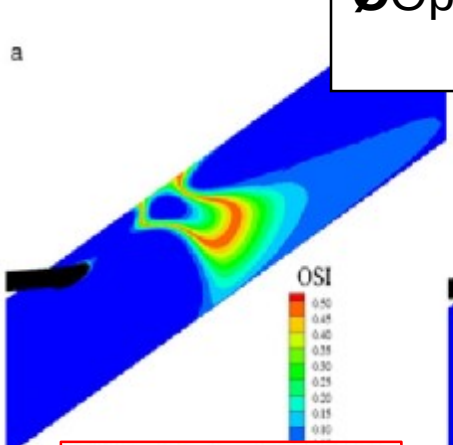
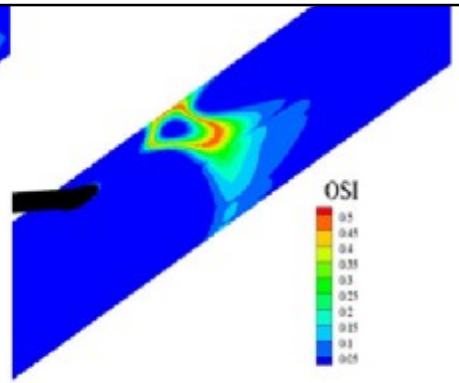
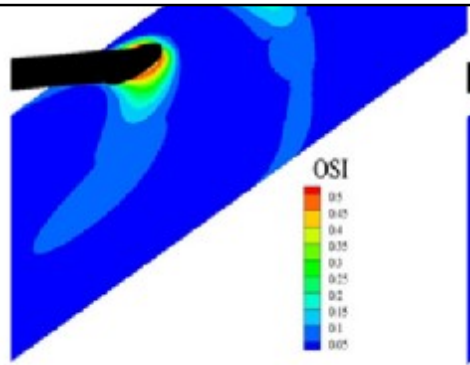


FIG. 3. Oscillatory shear index (OSI) of the vein roof for the arterial needle in the antegrade orientation: (a) inserted and (b) rotated.





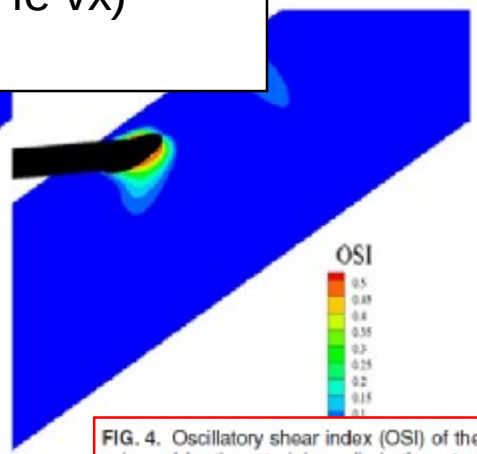


FIG. 4. Oscillatory shear index (OSI) of the vein roof for the arterial needle in the retrograde orientation: (a) inserted and (b) rotated.

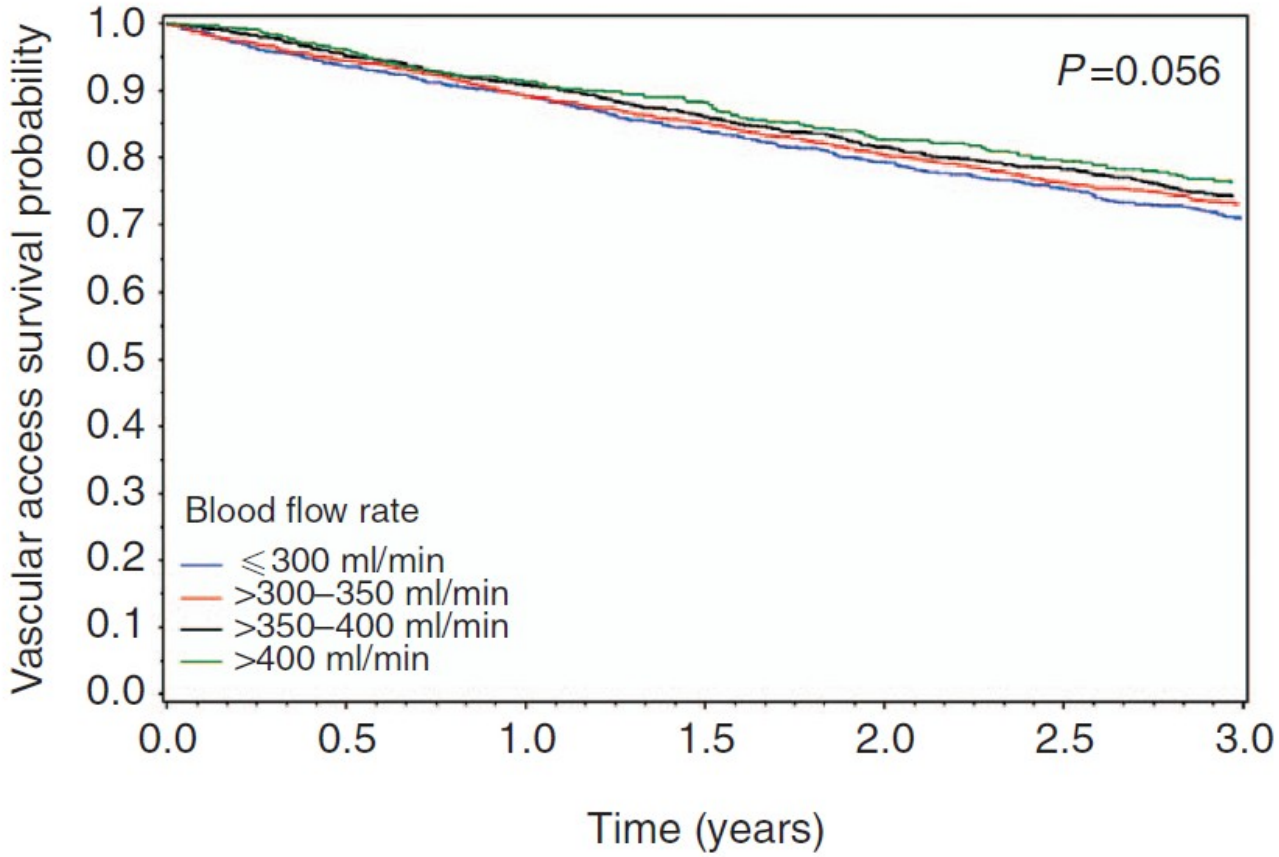
Fulker et al. Artif Organs. 2015

Faut-il faire un garrot pour la ponction?

Parameter	Category	Reference	HR	95% CI		*P*-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

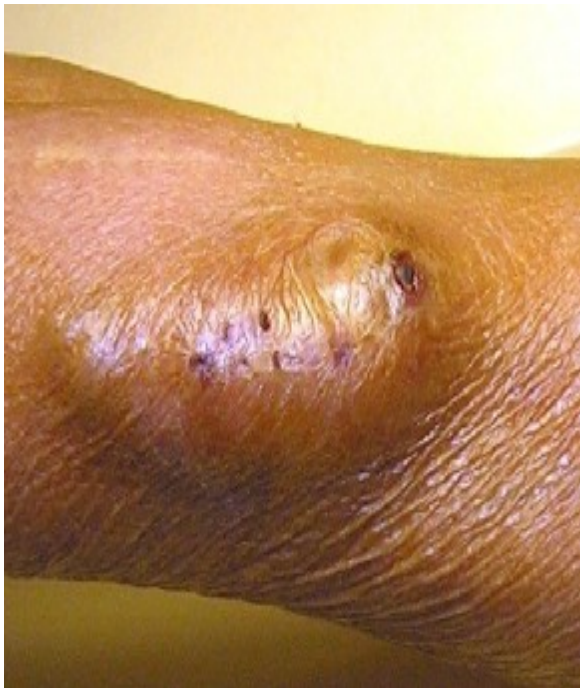
Parisotto et al, Kidney Int, 2014

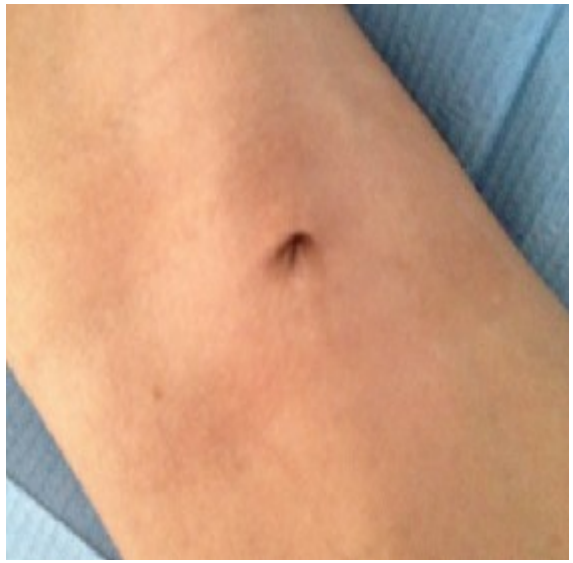
Quel débit pompe à sang?

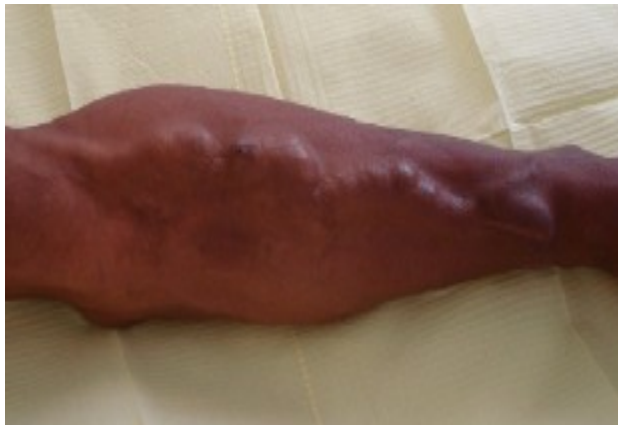


Parisotto et al, Kidney Int, 2014

Buttonehole ou rope ladder?



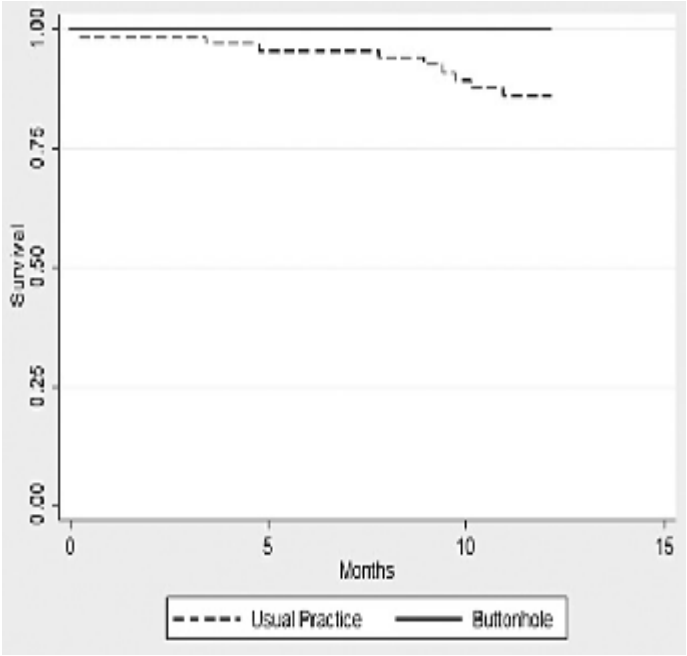




. In autogenous fistulae, particularly those with only a short vein segment available for needling, the buttonhole method is preferred over area puncture.

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

Buttonehole ou rope ladder?



Vaux, Am J Kidney Dis, 2013

Table 2. Rate difference of arteriovenous fistula events by cannulation technique

AVF Events	Risk Associated with BH Compared with RL[a]			
	Univariate Analysis		Adjusted Analysis[b]	
	IRR (95% CI)	*P* Value	IRR (95% CI)	*P* Value
Systemic infections	2.71 (0.66 to 11.09)	0.17	2.52 (0.63 to 10.16)	0.19
Local infections	6.13 (0.72 to 52.0)	0.09	6.27 (0.72 to 54.95)	0.10
All AVF infections	3.85 (1.66 to 12.77)	0.03	3.75 (1.10 to 12.79)	0.04
Surgical interventions (including AVF loss)	1.08 (0.33 to 3.55)	0.90	0.87 (0.26 to 2.97)	0.82

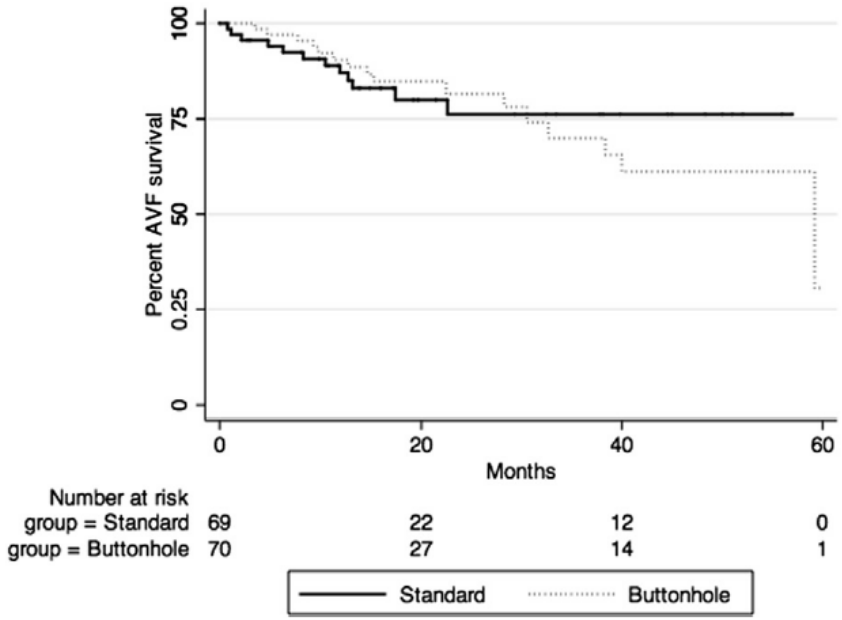
AVF, arteriovenous fistula; BH, buttonhole; RL, rope ladder; IRR, incidence rate ratio; 95% CI, 95% confidence interval.
[a]Started HHD with RL and later converted to BH.
[b]The analysis was adjusted for patient age and diabetes status using Poisson regression.

MacRae, Am J Kidney Dis, 2013

Parameter	Category	Reference	HR	95% CI		P-value
Cannulation technique	Buttonhole	Area	0.78	0.61	1.00	0.05
	Rope-ladder		0.89	0.79	1.00	0.06

Parisotto et al, Kidney Int, 2014

Buttonehole ou rope ladder?



MacRae, Am J Kidney Dis, 2014

Table 2. Primary and Secondary Outcomes Using Intention-to-Treat Analysis

	Standard (n = 69)	Buttonhole (n = 70)	IRR (95% CI)	*P*
AVF survival (mo)[a]	16 [10.6-29.3]	18.4 [10.9-32.7]		0.2
Thrombosis rate	0.05 [0.03-0.11]	0.04 [0.02-0.09]	0.75 (0.25-2.24)	0.6
Fistulogram rate	0.75 [0.5-1.1]	0.99 [0.8-1.3]	1.36 (0.88-2.09)	0.2
PTA rate	0.72 [0.48-1.08]	0.90 [0.66-1.21]	1.28 (0.78-2.10)	0.3
Surgical intervention rate	0.11 [0.06-0.21]	0.09 [0.05-0.16]	0.79 (0.33-1.89)	0.6
Total infections	0	12	63.29 (22.2-180.0)	<0.001
Localized/exit site		3		
S aureus bacteremia		9		

Ponctions de FAV:
quelques pistes pour améliorer leur survie

- Quand? **Minimum 14 jours, 30 jours idéal. <72h nouvelles prothèses**
- Imagerie avant la première ponction? **Doppler si possible. Ponction écho-guidée pour les FAV profondes**
- 1 ou 2 aiguilles? **1 aiguille les 6 premières séances**
- Taille d'aiguille? **15 ou 14G**
- Direction de l'aiguille artérielle? **Privilégier antérograde**
- Biseau vers le haut ou vers le bas? **Biseau vers le haut sauf si pressions élevées**
- Ponction avec un garrot? **Garrot par le patient ou IDE**
- Débit pompe? **Indifférent**
- Buttonehole ou rope ladder? **Selon les habitudes du service**

Merci de votre attention