FRESENIUS MEDICAL CARE

Surveillance of arteriovenous vascular access by thermodilution

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Presentation outline

Introduction

- Vascular access survival is a crucial issue associated with morbidity and mortality of patients undergoing haemodialysis. *(Leivaditis, K, 2013)*

- The development of stenosis is the main factor leading to thrombosis and failure of arteriovenous vascular accesses (AVA) such as arteriovenous fistulae (AVF) and polytetrafluoroethylene grafts (PTFE). *(KDOQI-Clinical practice guidelines in vascular access: 2006 update)*

- To prevent it and therefore reduce the use of central venous catheter, as well as hospitalizations and costs associated with vascular access, we must develop structured programs for surveillance in haemodialysis (HD) units. *(Leivaditis, K, 2013)*

Introduction

- An AVA surveillance programme in HD units should focus on the early detection of potential AVA dysfunctions promoting timely correction by angioplasty or surgical intervention. *(Leivaditis, K, 2013; Roca-Tey, R, 2012)*

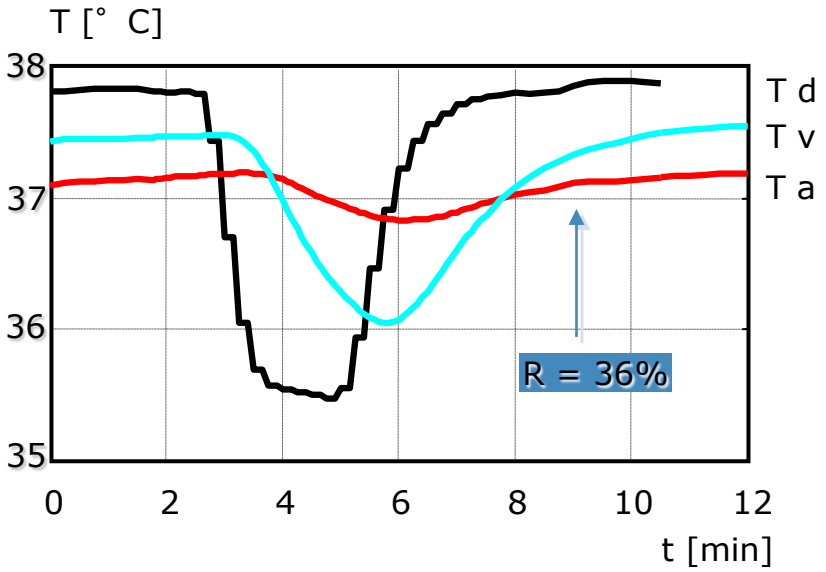
- Vascular access flow (Qa) determination is considered the "gold standard" in AVA surveillance (*KDOQI-Clinical practice guidelines in vascular access: 2006 update)*.

- In our clinic, we evaluate Qa by thermodilution. An integrated device in the dialysis machine makes the procedure easy and non-invasive, without requiring any additional equipment. *(Schneditz, D et al, 2003; Schneditz, D et al, 1999)*

Presentation outline

Objectives

- **To assess whether thermodilution can predict a potential dysfunction of the AVA at an early stage in patients with end-stage renal disease undergoing haemodialysis.**



Presentation outline

Methods

- **We conducted a quantitative, descriptive-correlational, longitudinal, and retrospective study from June 2011 to June 2015.**

- **By means of non-probabilistic sampling we assessed 127 AVAs of 108 patients of our centre within the scope of the AVA surveillance programme, including vascular access flow (Qa) determination by thermodilution and patient treatment according to a surveillance protocol.**

- **The 108 patients in the sample were referred for angiography or surgical intervention for suspected AVA dysfunction or thrombosis at least once during the follow-up.**

Presentation outline

Results (1/4)

- **85 thrombotic events and 53 AVA failures were reported.**

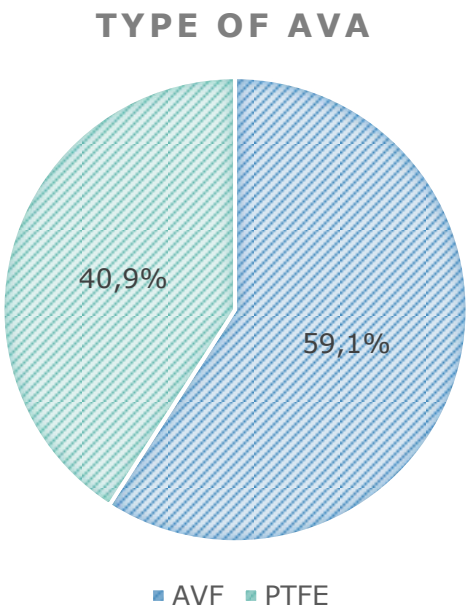


Fig. 1 – Type of AVA

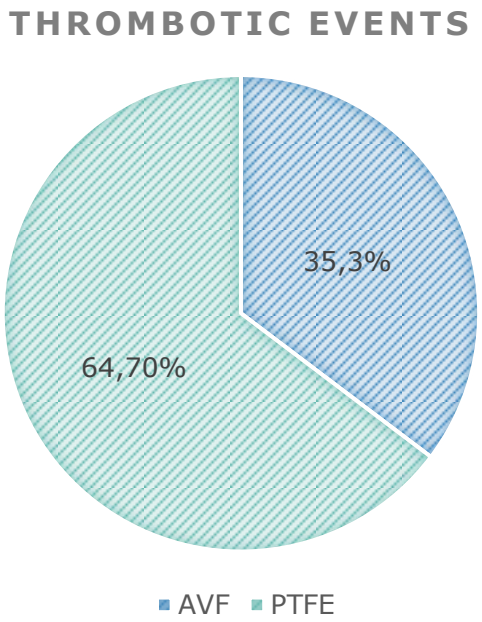


Fig. 2 – Thrombotic events

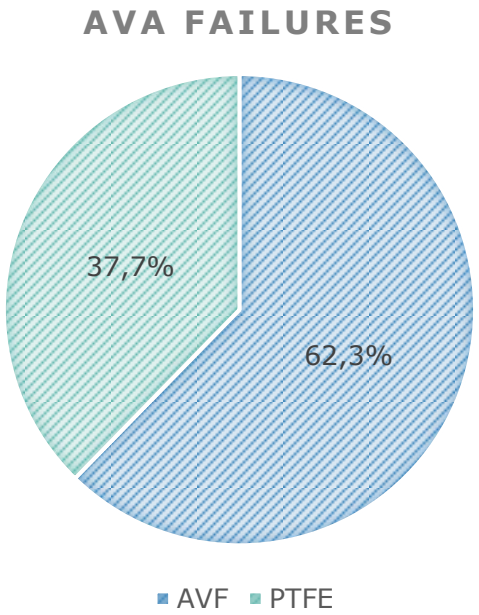


Fig. 3 – AVA failures

Results (2/4)

- **We did not observe any statistically significant differences between the Qa values of fistulae and grafts (*p*=0.224).**

Qa	Type of AVA	$\bar{X}$	σ	$X_{min.}$	$X_{max.}$	N
Total 49 months	AVF	996.03	452.48	685	1822	75
	PTFE	951.32	350.48	687	1355	52

Table 1 - Vascular access flow (Qa) by type of AVA

Qa	t	df	Sig	α
Total 49 months	0.593	123	0.224	>0.05

Table 2 – Mean differences in vascular access flow (Qa) by type of AVA (t-Student Test)

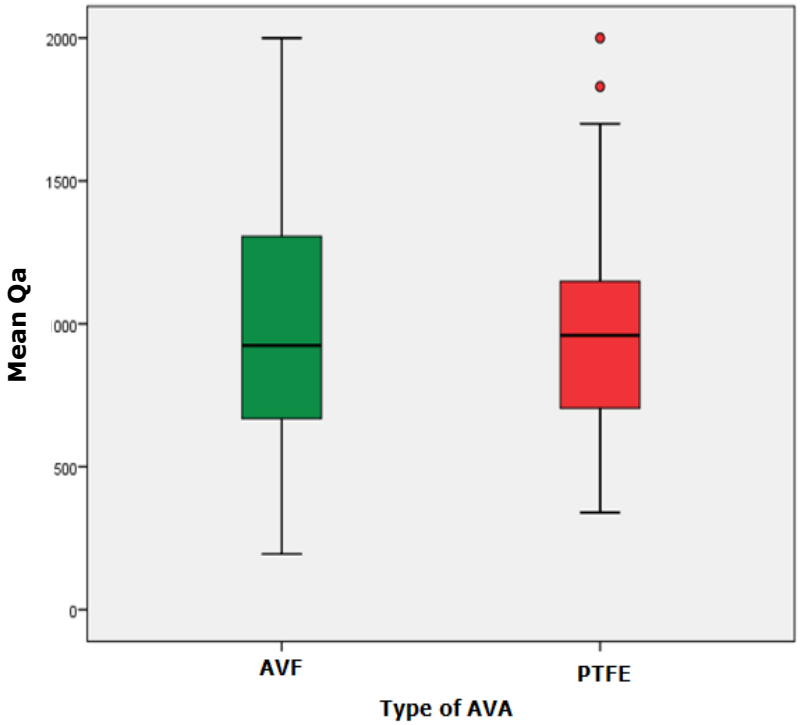


Fig. 4 –Mean Qa by type of AVA

Results (3/4)

- **The last mean Qa value of the fistulae before access failure is 920.5ml/min.**
- **The last mean Qa value of the graft before access failure is 782.5ml/min.**

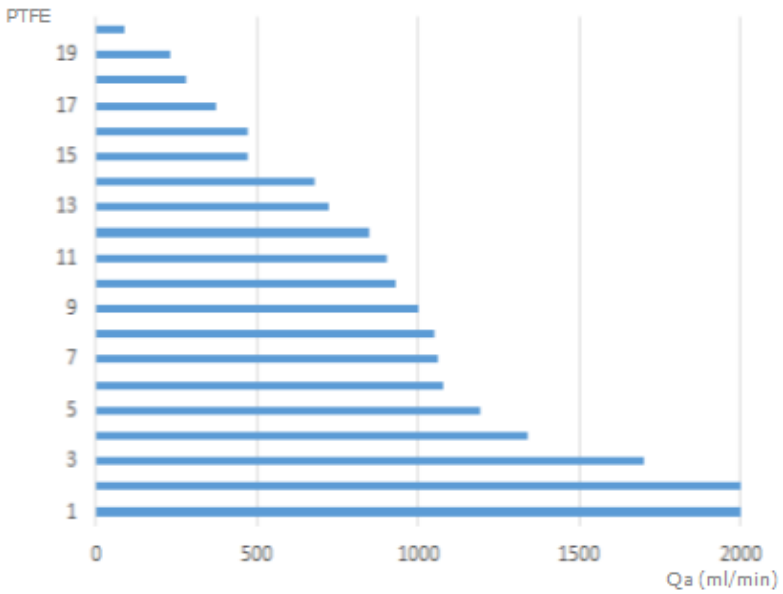


Fig. 5 – PTFE: Last Qa value before access failure

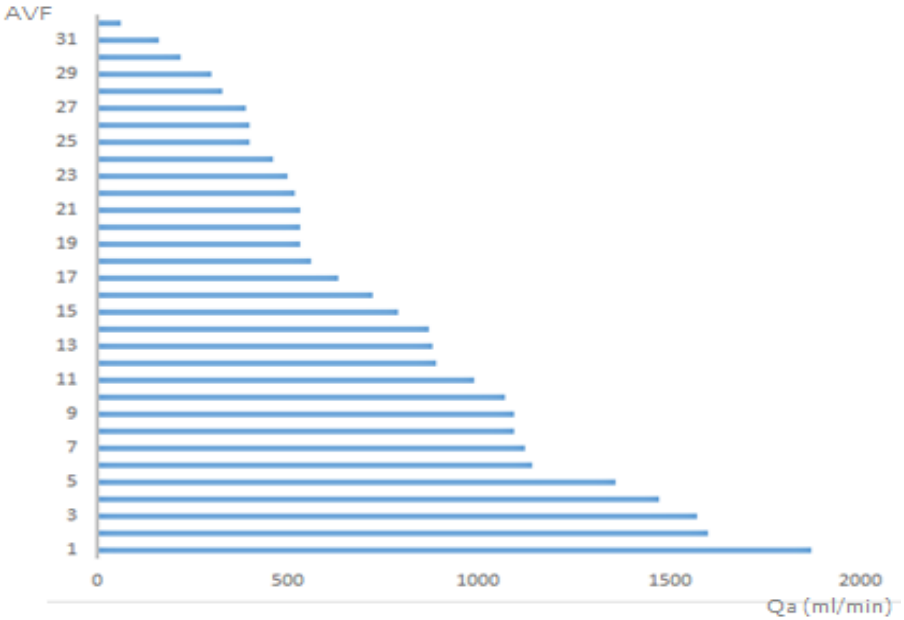


Fig. 6 – AVF: Last Qa value before access failure

Last Qa (ml/min)	$\bar{X}$
AVF	920.50
PTFE	782.50

Table 3 – Mean Qa before access failure by type of AVA

Results (4/4)

- **The average time period between the date of AVA construction and the first thrombotic event was 30.48 months (Md=20.00; σ=28.808). The average difference between the first and the second thrombotic event is about 8.79 months (Md=6.00; σ=7.465).**

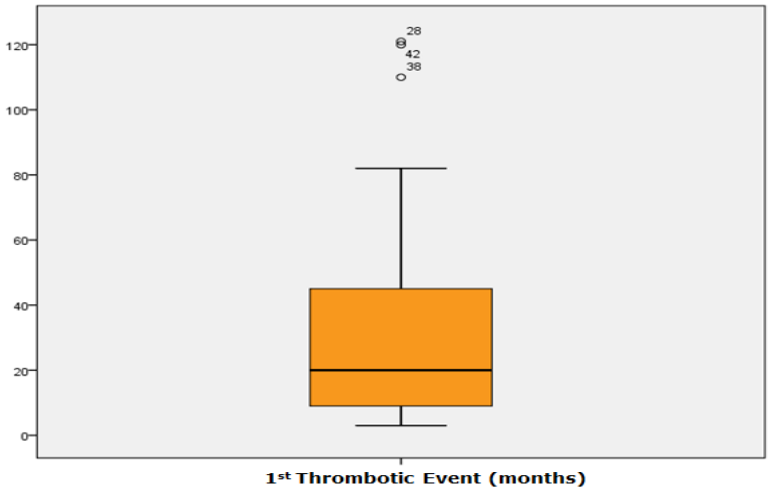


Fig. 7 – 1st Thrombotic event (months)

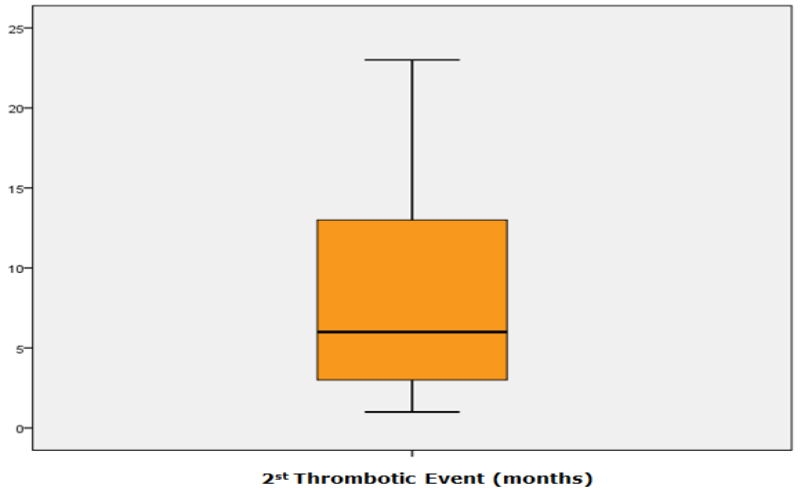


Fig. 8 – 2nd Thrombotic event (months)

Thrombosis-free survival	$\bar{X}$	Md	σ	$X_{mín.}$	$X_{máx.}$	N
1st Thrombotic Event	30.48	20.00	28.81	3	121	65
2nd Thrombotic Event	8.79	6.00	7.47	1	23	14

Table 4 – Thrombosis-free survival

Presentation outline

Conclusions

- **Strategies for an early detection of AVA dysfunctions prior to the onset of severe complications are crucial.**
- **We believe that the implementation of an AVA surveillance programme allows for early detection of a potential AVA dysfunction enabling early interventions (before thrombosis and AVA failure occur).**
- **Our analysis suggests that Qa surveillance by thermodilution is an effective screening method for dysfunctional AVAs.**

References

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Thank You Very Much for Your Attention!

Acknowledgments

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