

# Tenecteplase: an efficient thrombolytic agent for dialysis catheters with thrombotic occlusion

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## Introduction

Approximately one third of the patients are dialyzing with a tunneled dialysis catheter. Proper management of the vascular access is vital in improving patient outcomes. Thrombotic occlusion of the dialysis catheter, is a frequent complication that can lead to serious consequences, varying from inadequate dialysis dose delivery to increased mortality. The aim of the study was to establish how efficient is the thrombolytic agent Tenecteplase in restoring blood flow rate in hemodialysis catheters with partial or total occlusion.

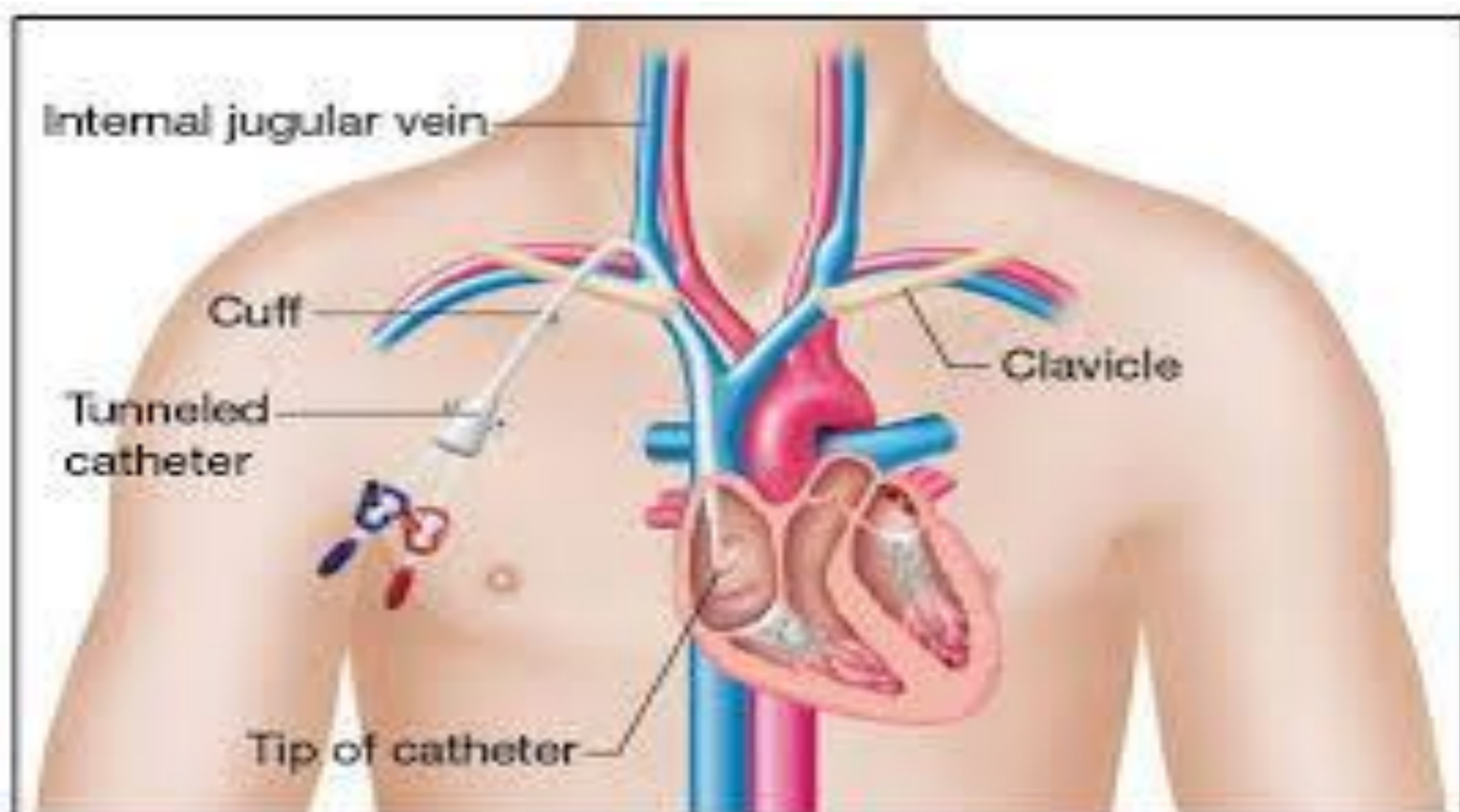


Image 1. Representation of a tunneled catheter.

## Materials and Methods

Our study comprised of 21 chronic hemodialysis patients diagnosed with catheter dysfunction based on KDOQI 2006 criteria. At the end of the dialysis session the catheter lock was performed by instillation of Tenecteplase (concentration 1 mg/ml). The dwell time was 48 or 72 hours. We have followed the blood flow rate before and after the administration of the thrombolytic agent, in a specific time table: at the start of the treatment, at one hour into the treatment, and at one hour before the end of the session. We also established the adequacy of dialysis dose delivery before and after the instillation of Tenecteplase by quantifying the total blood volume passed through the capillary dialysis system and by measuring eKTV by ADIMEA method. Also our study included 4 patients with no blood flow through CVC at the beginning of the dialysis session, for which we performed a rescue CVC therapy by instillation of Tenecteplase in a short dwell (30 minute). The statistic analysis (paired t-test) was performed with SPSS software vs22.

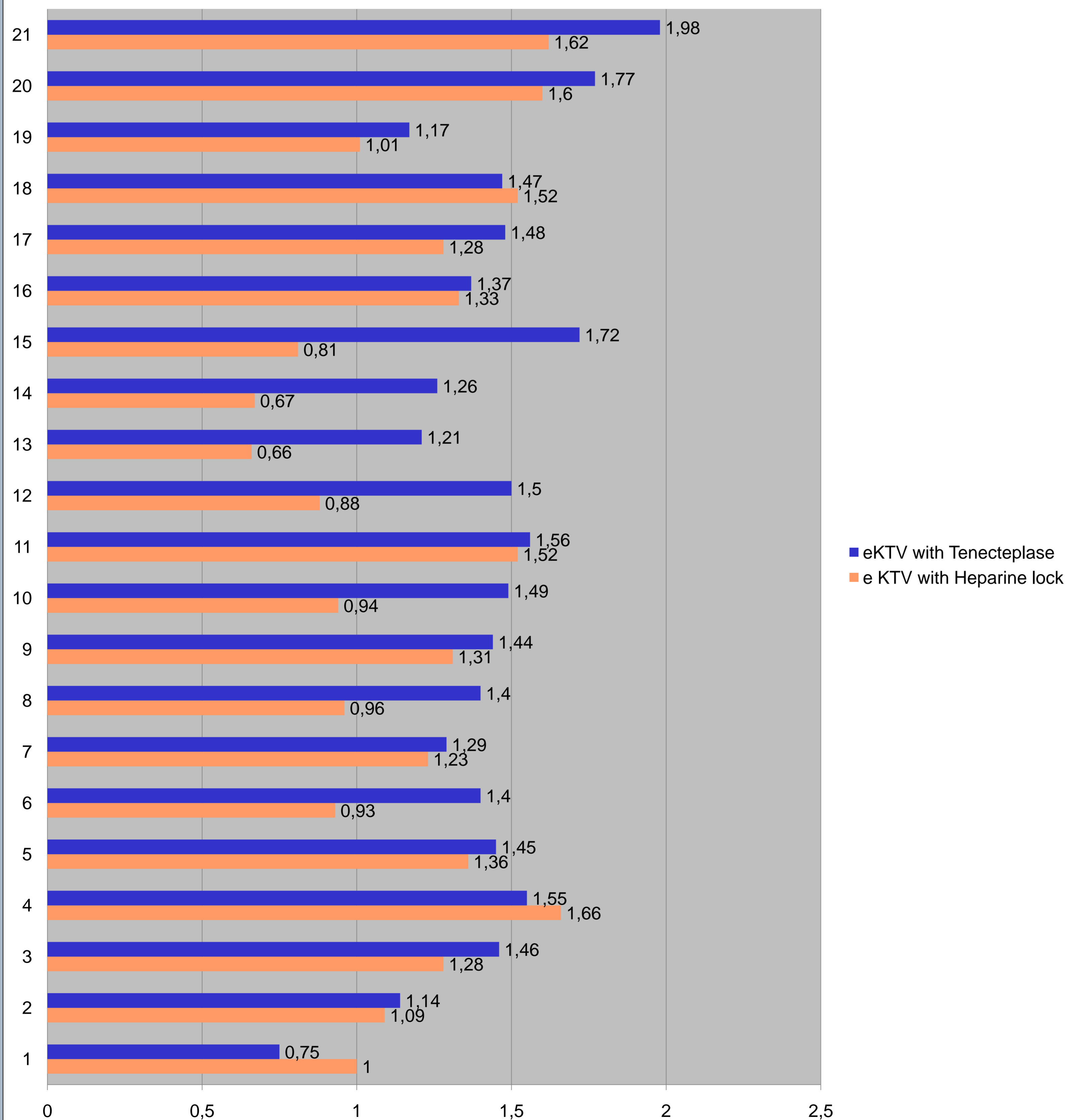


Fig.1 Improvement of dialysis efficiency with Tenecteplase compared with Heparine lock.

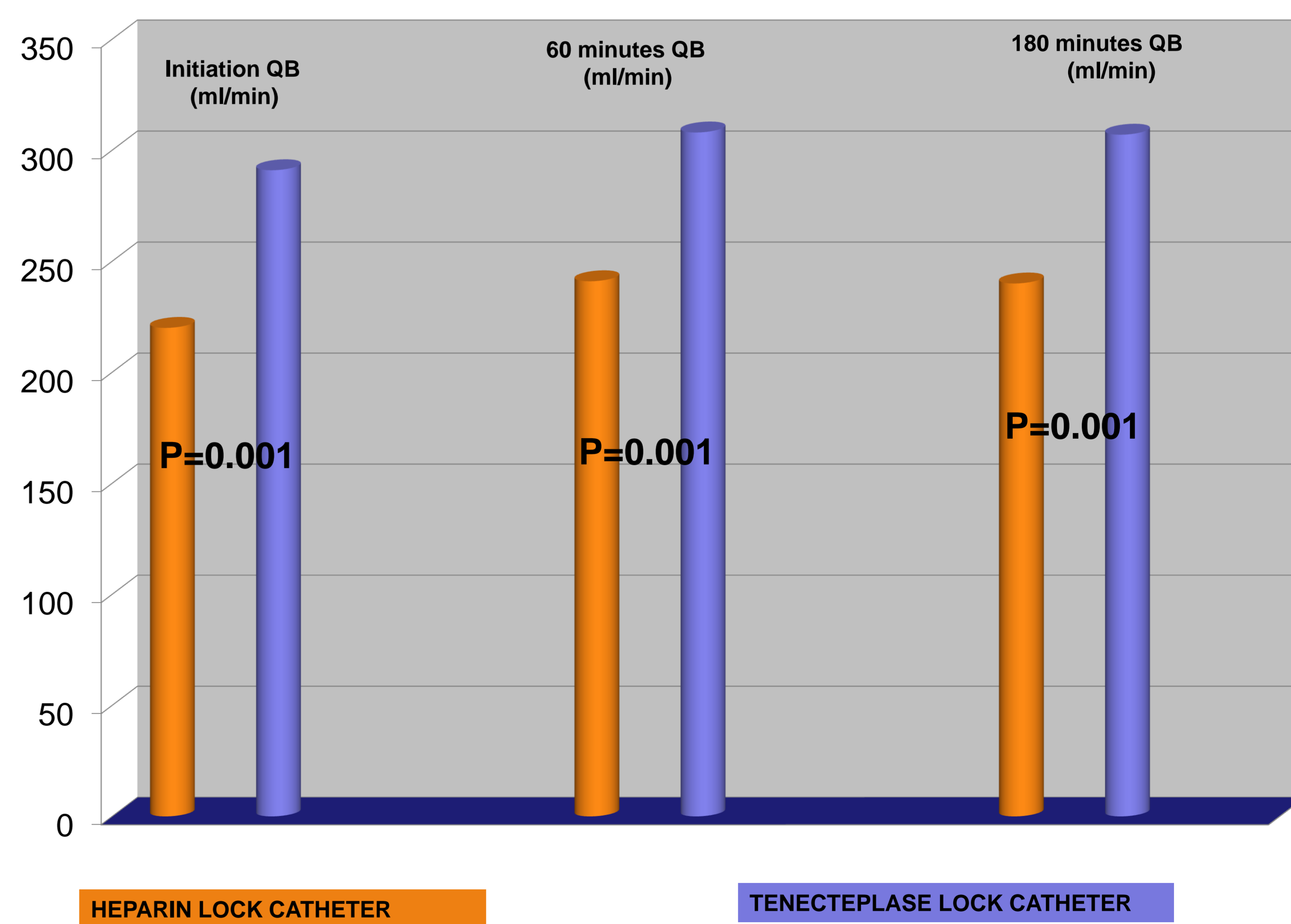
## Results

After the long dwell with Tenecteplase we noticed a significant increase on the average blood flow rate at the beginning of the dialysis session 220ml/min versus 291 ml/min(p=0,001), an hour after initiation 242 ml/min versus 308 ml/min (p=0,001) and an hour before the end of the dialysis session 240 ml/min versus 307 ml/min. (p=0,001). The average total blood volume passed through the capillary rose from 55.33 l to 67.05 l (p=0.004) and the efficacy of dialysis session (eKTV) improved from 1.17 to 1.42 (p=0.001). No adverse effects were reported after the administration of the thrombolytic agent. The average time in which the blood flow rate through CVC was maintained at an adequate value without other intervention was 17 days. In three months time after the administration of the thrombolytic agent, 3 of the patients were required to undergo a change of the vascular access. These were necessary due to other causes than thrombotic occlusion. In all cases with short dwell we obtained an adequate blood flow rate through the CVC (QB>300 ml/min).Therefore we have achieved an efficient dialysis treatment, where we could rescue the tunneled dialysis catheter, without side effects.

Table 1. Statistic analysis of the study.

SPSS STATISTIC ANALYSIS		Paired Samples Test							
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
Lower	Upper								
Pair 1	initiation flux1 - initiation flux2	-70,952	50,090	10,931	-93,753	-48,152	-6,491	20	0,000
Pair 2	60minutes flux1 - 60minutes flux2	-65,238	62,419	13,621	-93,651	-36,825	-4,790	20	0,000
Pair 3	180 minutesflux1 - 180 minutesflux2	-67,143	66,268	14,461	-97,308	-36,978	-4,643	20	0,000
Pair 4	eKTV1 - eKTV2	-,24762	,28813	,06288	-,37877	-,11646	-3,938	20	0,001
Pair 5	blood volume1 - blood volume2	-11,71810	16,74141	3,65327	-19,33869	-4,09750	-3,208	20	0,004

Fig.2. Comparison between Heparin and Tenecteplase lock catheters.



## Conclusions

Tenecteplase represents a short time effective solution in the therapeutic management of dialysis catheters, total or partial occluded.

- References  
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