

# Factors affecting the primary patency of the arteriovenous fistulae for hemodialysis

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## BACKGROUND

The arteriovenous fistula (AVF) failure is one of the most common morbidity in hemodialysis (HD) patients. The study of the AVF patency and its affecting factors reveals the populations with high-risk of access failure. The aim of our work was the study of the AVF primary and the factors that may affect them.

## METHODS

It was a retrospective study interesting AVF created before the end of 2009 in patients with end stage renal disease (ESRD) undergoing chronic HD. The end of the follow-up was in December 31, 2013. Actuarial survival was calculated by using Kaplan-Meier survival analysis. Differences between groups determined by using log-rank test for univariate analysis and by using cox regression method for multivariate analysis. Demographics epidemiological, clinical, biological, pharmacological, radiological and fistulae characteristics were studied.

## DEFINITION

**Primary patency:** The interval from the time of access creation until first access thrombosis or any intervention to maintain or restore blood flow.<sup>1</sup>

**Table I : Baseline characteristics of study patients**

	N	%
Age > 65 years	25	22,5%
Male	70	63%
Diabetes Mellitus	44	39,6%
Hypertension	76	68,5%
Atherosclerosis	29	26,1%

**Table II : AVF characteristics of study patients**

	RC AVF	CB AVF	BC AVF	BB AVF
N	78	1	25	22
%	61,9	0,8	19,8	17,5

RC: Radiocephalic. CB: Cubitobasilic. BC: Brachiocephalic BB: Brachiobasilic.

**Table III : Primary patency rates**

	6 Months	1 year	2 years	5 years
Primary patency	82%	78%	69%	42%

**Table IV: Factors affecting primary patency**

Studied Factor	Univariate	Multivariate
	Analysis (p=)	Analysis <sup>‡</sup> (p=)
Age > 65 years	<b>0,034<sup>†</sup></b>	0,140
Gender	0,868	-
Diabetes Mellitus	0,366	-
Hypertension	0,739	-
Atherosclerosis	0,400	-
Hypertension + Left Ventricular Hypertrophy	<b>0,004<sup>*</sup></b>	0,112
Antiplatelet	<b>0,015<sup>*</sup></b>	0,153
Catheter > 3 months	<b>0,046<sup>†</sup></b>	<b>0,044<sup>†</sup></b>
Phosphoremia > 45mg/l	<b>0,041<sup>*</sup></b>	0,084
C Reactive Protein > 5mg/l	<b>0,008<sup>†</sup></b>	<b>0,049<sup>†</sup></b>
BC AVF VS BB AVF	<b>0,047<sup>*</sup></b>	-

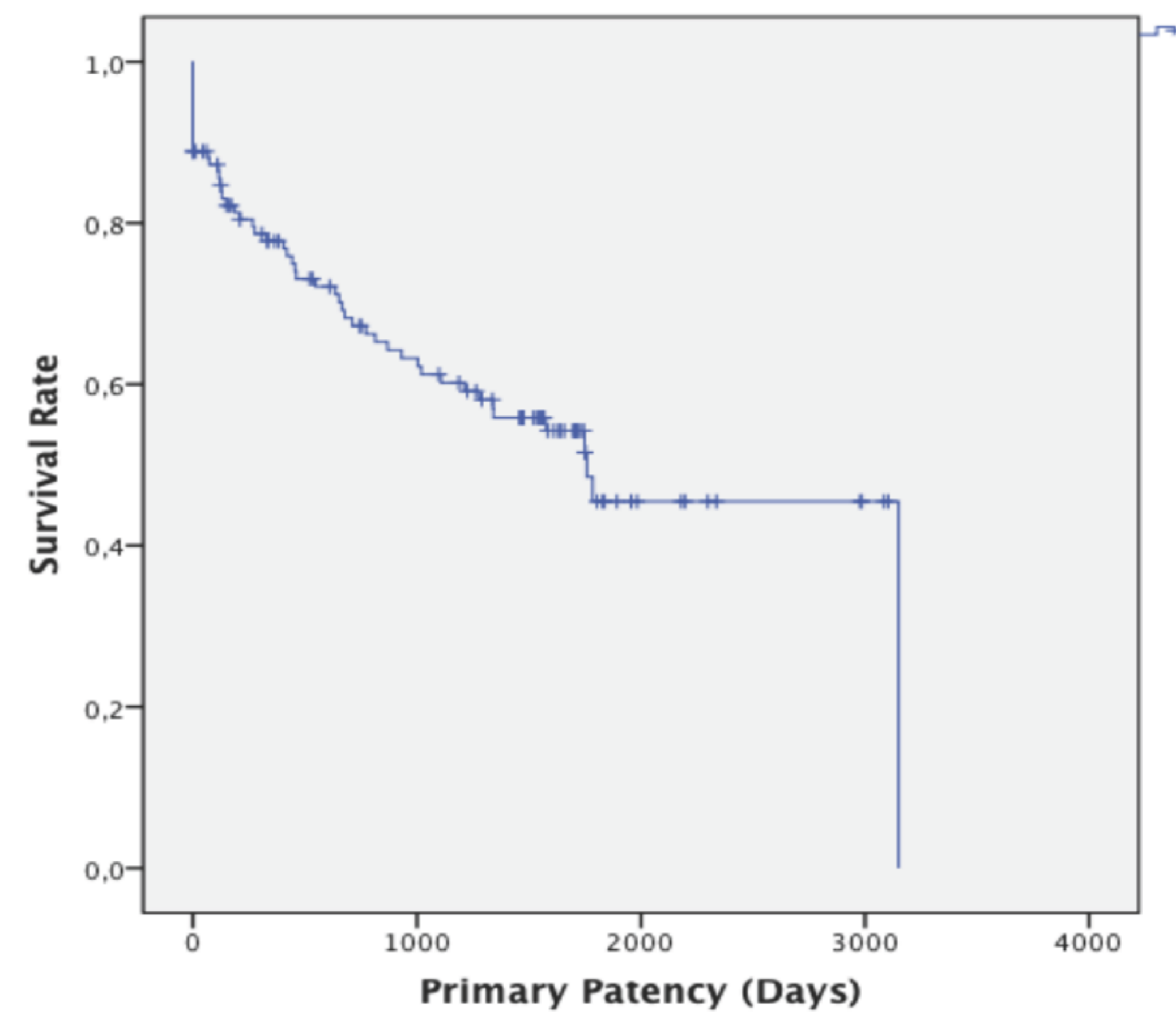
\*: Factor improving patency.

†: Factor impairing patency.

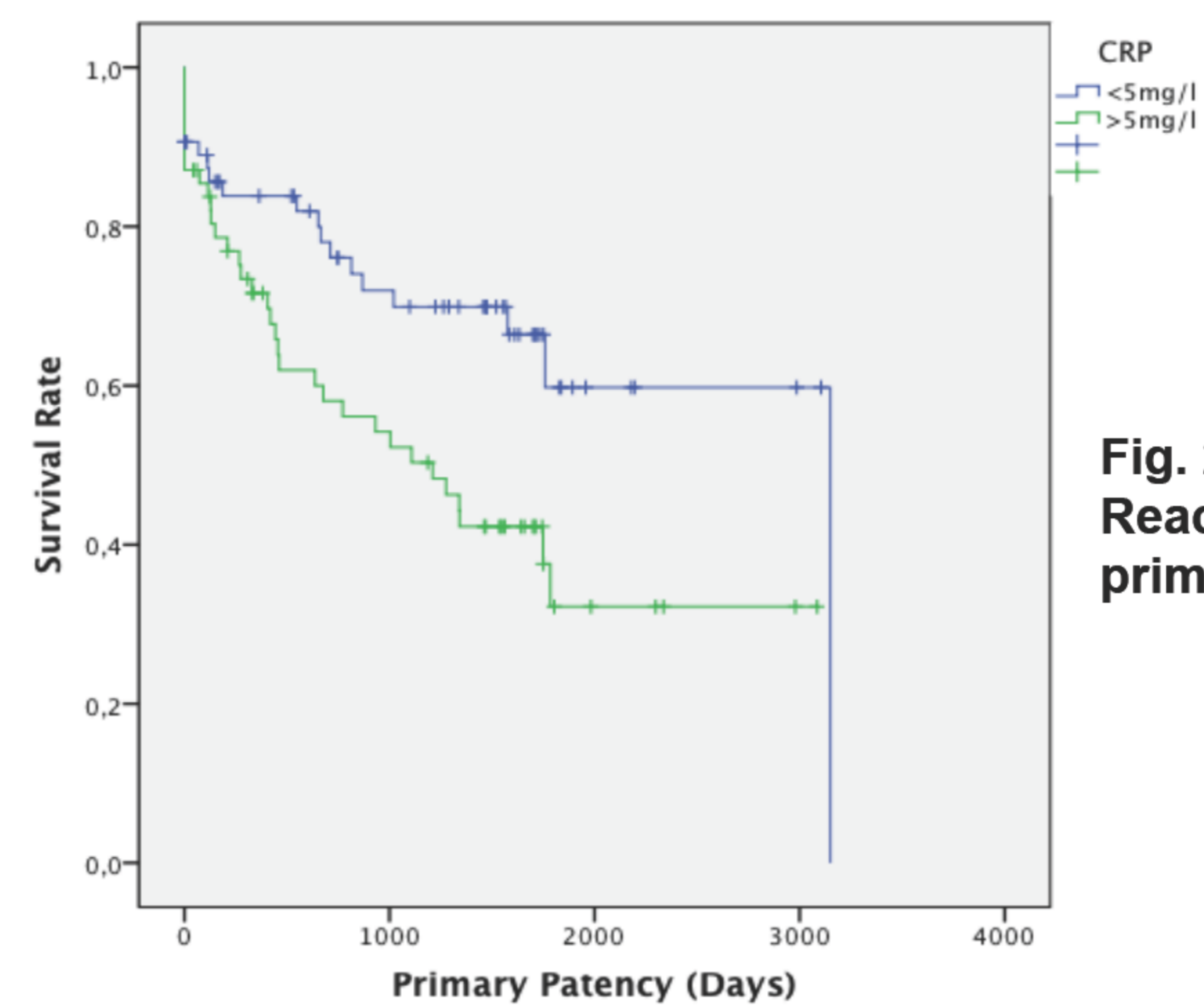
‡: Covariates in the model included: Age, hypertension with left ventricular hypertrophy, anterior catheter insertion, phosphoremia, C-Reactive Protein and antiplatelet intake.

## REFERENCES:

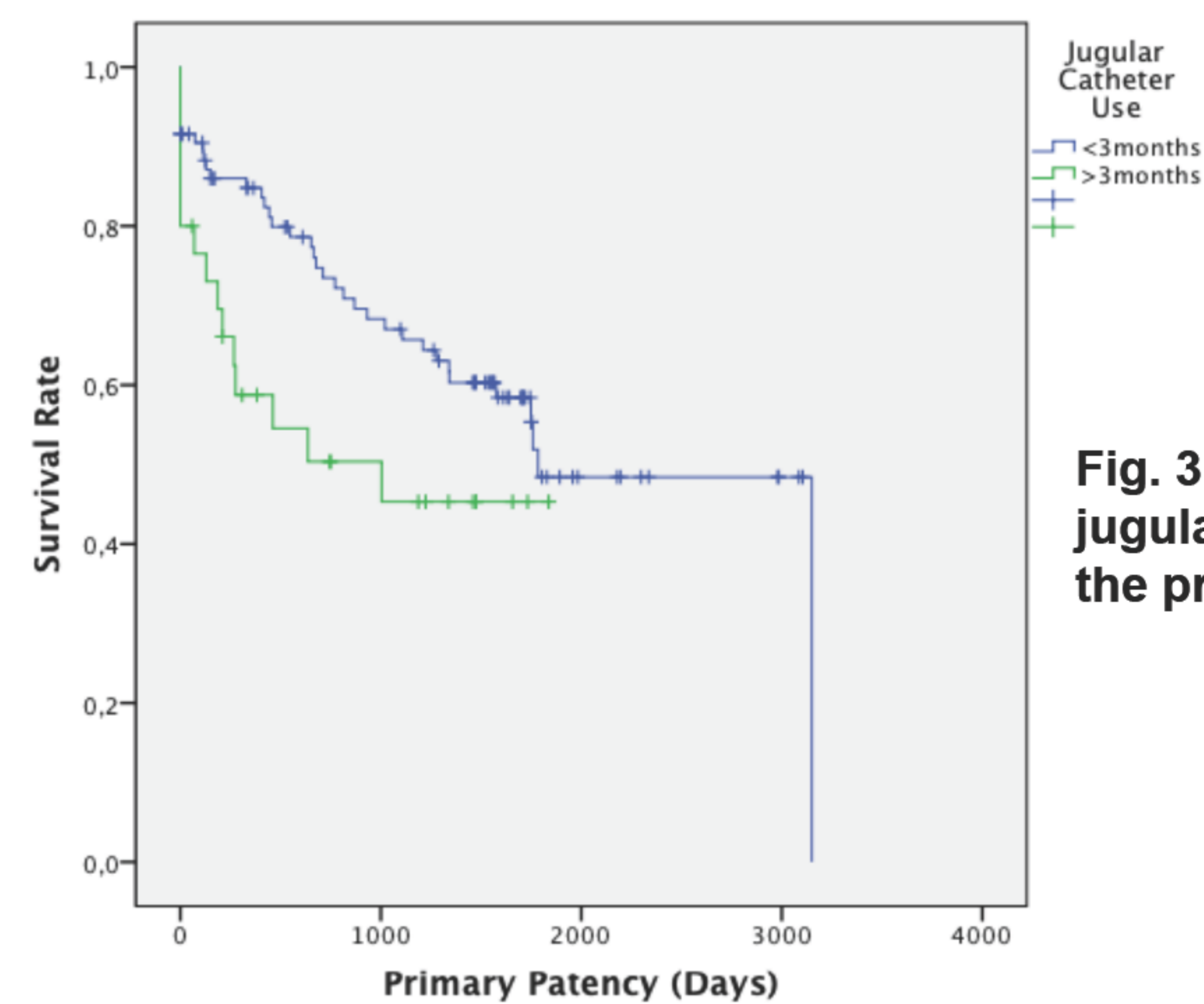
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**Fig. 1 : Primary patency survival curve.**



**Fig. 2 : The effect of C-Reactive Protein on the primary patency.**



**Fig. 3 : The effect of jugular catheter use on the primary patency.**

## DISCUSSION

- The patency rates of our study were similar to those of other studies.
- An early referral to a Nephrologist of the patients with chronic kidney disease reduces the catheter insertion and allows AVF creation and maturation before the HD onset. The treatment of anaemia, calcium phosphate and inflammatory troubles before AVF creation are beneficial for patency.
- The development of arteriovenous fistula thrombosis is associated with vascular intimal hyperplasia. Some studies suggested that serum C-reactive protein (CRP) predicts the development of vascular intima hyperplasia that conduces vascular access stenosis and thrombosis.<sup>2</sup> Long-term catheter for hemodialysis stimulates the intimal hyperplasia by its inflammatory effect.

## CONCLUSIONS

An early referral to the nephrologist and an AVF creation and maturation before ESRD are essential for this vascular access primary patency. These are the main means to avoid HD catheters and their inflammatory effects.

