TRANSPLANT ARTERY STENOSIS : A CASE SERIES

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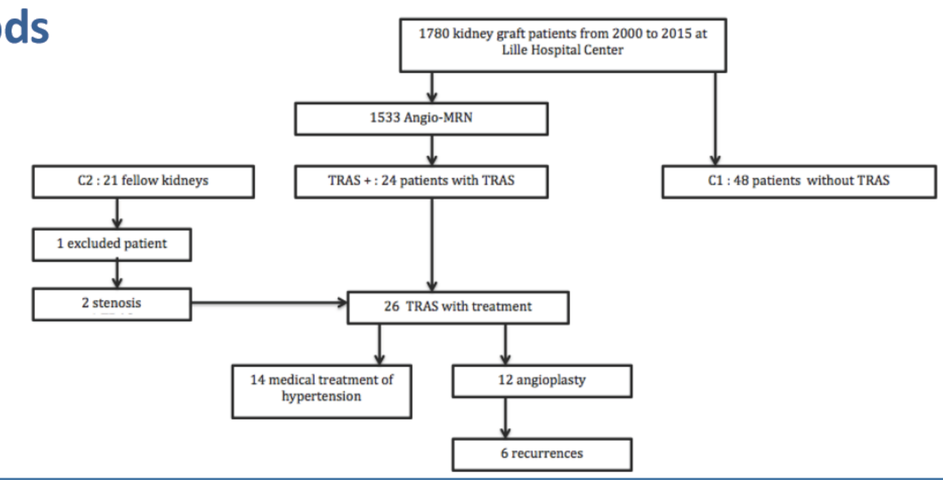
Introduction

Transplant renal artery stenosis (TRAS) is the most common of vascular complication in kidney transplantation, and its occurrence may decrease the graft survival (67 versus 91% at 1-year post-transplant) (1). The absence of specific clinical symptoms may complicate the diagnosis of TRAS, whose an early treatment is important. Its management also remains complex, and there is no consensual recommendations (2). **We studied 24 TRAS patients in order to identify risk factors and analyze the benefits of angioplasty (ATL).**

Material and Methods

This retrospective study identified 24 TRAS patients (TRAS+, n=24) in a French single-center from 2000 to 2015, and compared their pretransplant characteristics and outcome to 2 controls groups: **48 randomly selected controls (C1), and 20 recipients who received the contralateral kidney (C2).**

Patients with TRAS were identified from radiological register. Patients with combined graft were excluded.



Results

PATIENTS CHARACTERISTICS

Incidence of TRAS was **1,4%** in our population (24/1780 patients). TRAS patients were predominantly males (71%), 52±13 years old, and had **cardiovascular comorbidities**: hypertension, dyslipidemia, diabetes, and active smoking were respectively reported in 59%, 29%, 17% and 8% of cases.
Stenosis was diagnosed in average 5 months after transplantation and was often symptomatic: resistant hypertension (31%), acute renal failure (23%), and vascular murmur (8%). They mesured 15,9 mm and were estimated by 75% on ultrasound. 59,1% were ostial.

RISK FACTORS ANALYSIS

TRAS+ patients had significantly more aorto-iliac vascular calcifications than in C1 group. There cardiovascular risk was higher ("SCORE") and more smoking patients were found. Beside cardiovascular risk factors, no difference was observed. Compared to C2 patients, **hypertension** before transplantation was more common in TRAS+ and **warm ischemia** was longer. There was no other difference between the 2 groups.
So, comparing TRAS+ vs TRAS- patients, we found **vascular calcifications and living donor as independent risk factors** of TRAS in a multivariate analysis.

Table 1 : Comparison of characteristics in patients TRAS vs C1

	TRAS + (n=24)	C1 (n=48)	P (TRAS+ vs C1)
Characteristics			
Age, years	52,5 ± 13	47,8 ± 11,4	0,241
Sex (men), n (%)	17 (70, 8)	31 (64,6)	0,791
First graft, n (%)	21 (91,3)	40 (83,3)	0,185
Dialysis, n (%)	23 (95,8)	46 (95,8)	0,375
Deceased donor, n (%)	21 (87,5)	47 (97,9)	0,314
Cardiovascular (recipients)			
Calcifications, n (%)	17 (70,8)	11 (22,9)	**0,001**
Diabete, n (%)	4 (16,7)	5 (10,4)	1,0
Hypertension n (%)	14 (58,3)	23 (47,9)	0,560
Smoking, n (%)	8 (33,3)	10 (20,9)	**0,033**
Dyslipidaemia, n (%)	7 (29,2)	5 (10,4)	0,134
High SCORE, n (%)	14 (58,3)	8 (16,7)	**0,002**
Ischemic cardiopathy, n (%)	6 (25)	3 (6,25)	0,156
Peripheral Arteriopathy n (%)	2 (8,7)	1 (2,08)	0,730
Cardiovascular (donor)			
Vascular death, n (%)	12 (57,1)	21 (44,7)	1,0
Age, years	54,7±15,8	47,0±14,4	0,117
Diabete, n (%)	0 (0)	2 (4,44)	1,0
Hypertension, n (%)	7 (29,2)	9 (23,1)	1,0
Smoking, n (%)	6 (25,0)	23 (52,3)	0,140
Cardiovascular disease, n (%)	1 (4,17)	2 (5,13)	1,0
Kidney extended criteria, n (%)	12 (50,0)	12 (25,0)	0,063

Table 2 : Comparison of characteristics in patients TRAS vs C2

	TRAS + (n=24)	C2 (n=20)	P (TRAS+ vs C2)
Cardiovascular (recipients)			
Calcifications, n (%)	17 (70,8)	9 (45,0)	0,440
Diabete, n (%)	4 (16,7)	2 (10,0)	1,000
Hypertension n (%)	14 (58,3)	3 (15,0)	**0,026**
Smoking, n (%)	8 (33,3)	14 (70,0)	< 0,001
Dyslipidaemia, n (%)	7 (29,2)	10 (50,0)	0,270
High SCORE, n (%)	14 (58,3)	8 (40,0)	0,364
Ischemic cardiopathy, n (%)	6 (25)	4 (20,0)	0,734
Peripheral Arteriopathy n (%)	2 (8,7)	1 (5,0)	1,000

*SCORE : 10 years risk of vascular events in an European population integrating the following parameters : active smoking, sex, systolic blood pressure, HDL and total cholesterol, country. It was high if > 5 %.

	TRAS + (n=24)	C2 (n=20)	P (TRAS+ vs C2)
Immunology			
Hyperimmune recipients, n (%)	4 (16,7)	5 (25,0)	1,000
Ac anti-HLA before transplant	7 (29,2)	6 (30,0)	1,000
Infectious			
CMV D+/R-, n (%)	7 (29,2)	4 (20,0)	0,737
EBV D+/R-, n (%)	0 (0)	1 (5,0)	0,455
Surgery			
Perfusion machine, n (%)	3 (12,5)	6 (30,0)	0,391
Cold ischemia, h	17,1 ± 8,3	17,6 ± 8,0	0,982
Warm ischemia, min	100 [68, 8 ; 151]	47,5 [32,2 ; 60,5]	**<0,001**
Only one artery, n (%)	19 (79,2)	17 (85,0)	0,609

PATIENTS OUTCOME

TRAS+ patients had a higher serum creatinine (168 [126 ;201] µmol/L in TRAS group vs 115 [106 ;133] µmol/L in C1 group, p=0,003 - and 106 [88,4 ; 133] µmol/L in C2 group, p=0,002) at 1 year post graft and a lower graft survival (Figure 1). Eleven patients were treated with ATL (52%, ATL+) and an improvement of their blood pressure and renal function were reported in 6 (55%) and 7 (64%) cases, respectively. Among ATL- patients, 5 (38%) kept a hypertension and 4 (31%) displayed a progression of the transplant dysfunction. Graft survival rate was better in ATL+ than in ATL- patients (Figure 2).

Figure 1 : Graft survival analysis : TRAS vs C1 and C2 (Kaplan-Meier)

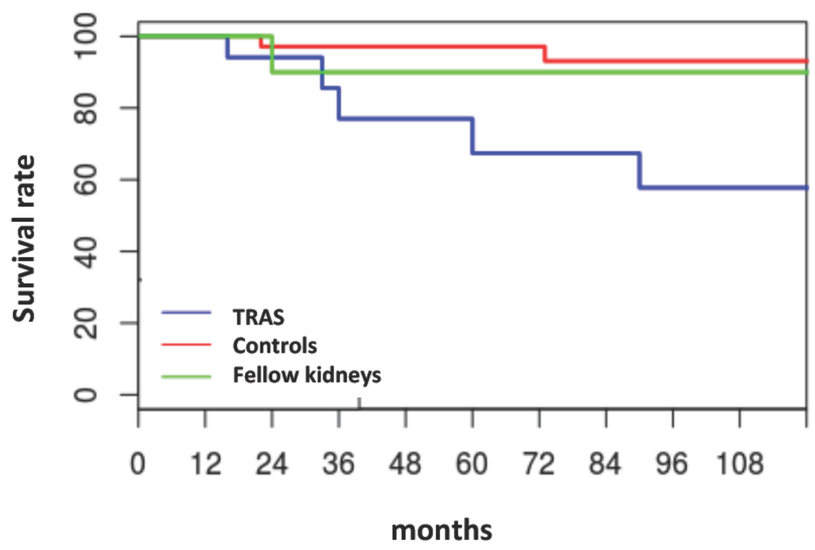
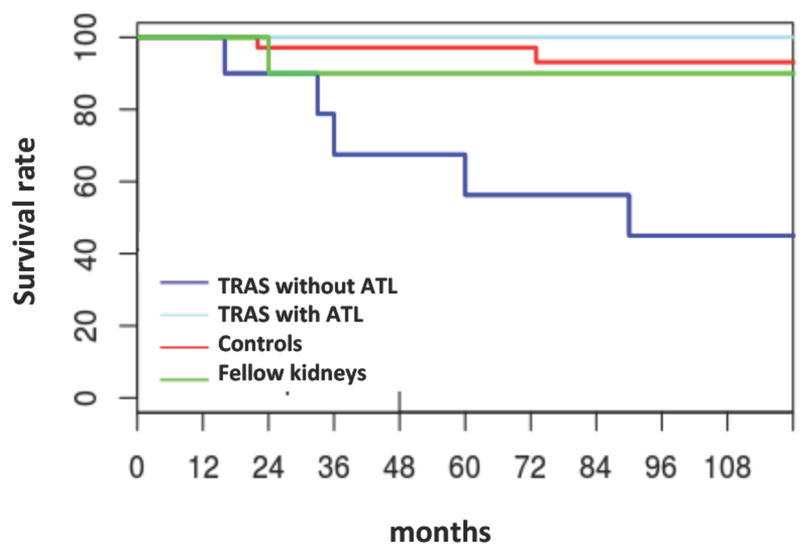


Figure 2 : Graft survival analysis according to the treatment: ATL+ vs ATL- (Kaplan-Meier)



Conclusion

This retrospective study reports that pre-transplant vascular calcification and cardiovascular comorbidities are independent risk factors associated with the occurence of TRAS (2)). The analysis TRAS versus fellow kidneys group - used to overcome the specific characteristics of donors - highlights the pre-existing hypertension and warm ischemia time. We also confirm that TRAS has a deleterious impact on renal function and graft survival (3), and the angioplasty treatment here seems to improve the transplant outcome (4).

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