

# Autoamputation of Toes in a Renal Transplant Recipient: Warning Sign of an Impending Graft Rejection?

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## ABSTRACT

The peripheral arterial occlusive disease is responsible for a significant amount of morbidity and mortality in patients of end-stage renal disease. This disease might not be as common as end-stage renal disease in vascular complications arising after renal transplant. The peripheral arterial occlusive disease is responsible for lower limb amputation in chronic kidney disease. It is important to identify the peripheral arterial occlusive disease as it may lead to septicaemia which in turn can result in multiple organ failure and thus can prove to be a potentially fatal complication of renal disease. Here the authors report a case of a 42-year-old female who had undergone a renal transplant four years back. She presented with breathlessness and bilateral pedal oedema along with autoamputation of toes and ultimately had to be taken for haemodialysis. The patient was intervened for an arteriovenous fistula for haemodialysis in view of graft rejection. Through this brief case report, the authors highlight the importance of a neglected autoamputation which was a missed warning sign of impending renal graft rejection in the present case.

**Keywords:** Chronic kidney disease, Haemodialysis, Peripheral vascular disease, Pedal oedema, Septicaemia

## CASE REPORT

A 42-year-old female was admitted to the hospital with the complaints of fever which was intermittent and low grade in nature and vomiting since four days. The frequency vomiting was 2-3 episodes per day containing recently ingested food products. She also had a history of decreased urine output for four days and complained of breathlessness on exertion for five days. There was no history of orthopnoea, Haemodialysis nocturnal dyspnoea, cough, cold and fever. No history of chest pain, palpitations. No history of loose stools, pain abdomen, or burning micturition. She also gave a history of non healing lesions on bilateral toes for one year which led to ulceration and gangrene formation. Patient was known hypertensive since seven years on regular antihypertensives and known diabetic on oral hypoglycaemic agents along with injectable insulin regularly. The patient had a past history of pulmonary tuberculosis for which she had taken antitubercular drug therapy for 1.5 years. Patient was a known case of chronic kidney disease on maintenance of haemodialysis for three years. In view of chronic renal failure, the patient underwent left renal transplantation six years back, for which she has been on regular immunosuppressive therapy. She was on cyclosporin 100 mg twice daily, azathioprine 50 mg twice daily and prednisolone 40 mg once a day for last three months. On general examination, patient had a pulse of 68 beats per minute and blood pressure of 160/90 mmHg. She was adequately built with mild puffiness around the eyes. The patient had black crusted lesions on bilateral toes with ulceration of skin and autoamputation of three toes in the right foot and second toe of the left foot and bilateral minimal pedal oedema was also present [Table/Fig-1]. Right kidney was measuring about 6.1×2.1 cm with raised echotexture and with loss of corticomedullary differentiation [Table/Fig-2].

An ultrasound abdomen pelvis was done which revealed grade 2 renal parenchymal disease of the transplanted kidney with raised resistive index [Table/Fig-3]. The Renal Resistive Index (RRI) of the patient was 0.58. Ankle Brachial Pressure Index (ABPI) was performed and it was noticed that there was no difference in calf blood flow between the ipsilateral (left side) and contralateral leg and patient's Ankle Brachial Pressure Index (ABPI) was 1.12. On the day of admission, the kidney function tests were deranged which were suggestive of chronic graft rejection [Table/Fig-4].



[Table/Fig-1]: Amputation of toes of both lower limb.



[Table/Fig-2]: Ultrasound abdomen pelvis showing shrunken right kidney.

A permanent tunneled catheter was placed during the course of stay and patient had to be taken up for haemodialysis. Five cycles of haemodialysis were done with multiple blood transfusions in view of low haemoglobin levels. Later a brachiocephalic fistula in the left arm was made in view of further requirement of haemodialysis twice in a week.



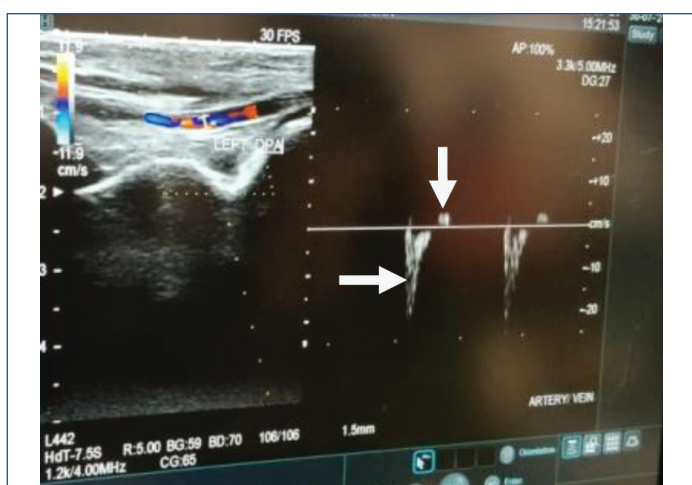
[Table/Fig-3]: Ultrasonography of abdomen pelvis showing shrunken left kidney.

Parameters	On admission day	Normal values
<b>Kidney function test</b>		
Serum urea	159 mg/dL	15-36 mg/dL
Serum creatinine	8.8 mg/dL	0.52-1.04 mg/dL
Serum sodium	138 mEq/L	137-147 mmol/L
Serum potassium	5.7 mEq/L	3.3-5.1 mmol/L
<b>Urine routine and microscopy</b>		
Albumin	++	Nil
Sugar	trace	Nil
Plenty of pus cells	present	Nil
Epithelial cells	2-4	1-2 cells/High power field
<b>HbA1c</b>	8.9%	<6%
<b>Complete blood count</b>		
Haemoglobin	6.2 gm/dL	12-15 gm%
Platelets	1.89 lakhs/cumm	1.50-4.10 lakhs/cumm
White blood cell count	10,200/cumm	4000-10000 cumm
Mean corpuscular volume	81.3 fL	80-100 fL
Haematocrit	19.3%	36-56%

[Table/Fig-4]: Laboratory investigations on day of admission. HbA1c: Glycated haemoglobin

In view of autoamputation of three toes in the right foot and second toe in the left foot in both lower limbs, arterial doppler was done and it revealed signs of peripheral artery disease [Table/Fig-5,6].

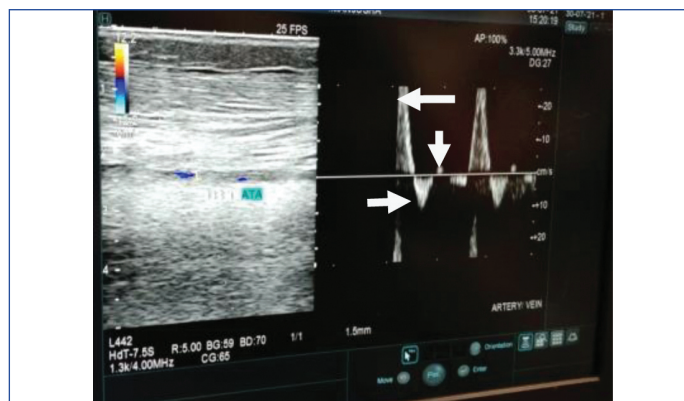
[Table/Fig-5] shows biphasic waveforms, while [Table/Fig-6] shows triphasic waveforms.



[Table/Fig-5]: Arterial doppler was done which revealed signs of peripheral artery disease.

There are two distinct waveforms in biphasic waveforms:

- 1) High resistive with diastolic flow reversal and
- 2) Low resistive with continuous forward flow during diastole.



[Table/Fig-6]: Arterial doppler was done which revealed signs of peripheral artery disease.

There are three distinct waveforms in triphasic waveforms:

- 1) Systole,
- 2) Early diastolic flow reversal and
- 3) A modest forward flow reflecting wave in late diastole.

As the patient was willing only for conservative management, daily betadine dressing was done for both feet. She was hospitalised for 21 days during which, patient was started on immunosuppressive like cyclosporine 100 mg BD, tacrolimus 50 mg BD, prednisolone 40 mg OD orally and tapered gradually. Before discharging her kidney function test was repeated and it was noticed urea and creatinine levels were significantly reduced.

Aggressive diabetic control, low dose steroids, immunosuppressives and other supportive measures with an advise of haemodialysis twice a week and also she was advised to follow-up in General Medicine Outpatient Department (OPD) with fasting blood sugar and postprandial blood sugar reports after every three months and she also advised for betadine dressing after every 15 days so as to prevent the infection of both lower limbs.

## DISCUSSION

Chronic kidney disease is associated with accelerated atherosclerosis and peripheral vascular disease. Renal transplantation is the preferred approach for renal replacement therapy, having been shown to improve quality of life, extend life expectancy and be more cost-effective than continuing dialysis [1,2]. A new endeavour has been made to expand the benefits of transplantation to older patients with additional co-morbidities. Despite a presumed higher risk of complications, current data suggests that results in these patients remain positive [3]. However, because there are no commonly accepted rules for selecting transplant candidates, it is uncertain when the dangers outweigh the benefits. When considering an older patient for transplantation, one of the concerns is Peripheral Vascular Disease (PVD), which affects approximately 25% of patients with end-stage renal disease [4].

In addition to a clusterin of common risk factors, patients on dialysis often suffer from hyperphosphataemia and hypercalcaemia, predisposing them to vascular calcification [5]. Chang BB et al., in their study of bypass surgery for limb salvage, remarked that the presence of renal failure implies calcific arteriopathy, decreased resistance to infection, impaired wound healing, host-factor deficiencies, low albumin, uraemia and immunosuppression, each of which adversely influences rehabilitation and survival [6]. Major risk factors for this disease in end-stage renal disease are still not understood properly but probably includes uraemia associated risk factors [7]. The peripheral arterial disease is common amongst end-stage renal disease patients [1]. Even if diabetes mellitus is not taken into account the prevalence of peripheral arterial occlusive disease in end-stage renal disease patients is approximately 10 times that in general population [2]. Patients with peripheral artery disease have shown to have higher rate of renal graft rejection postoperatively [8]. ABPI is a simple and direct, non invasive and low-cost method of

diagnosing lower limb arterial insufficiency [9]. Systolic pressure is higher at the ankles in healthy people, with a normal ABPI range of 1.0-1.2 in the supine position [10]. This is because the downstream vascular beds differ [11]. The ABPI of patients with intermittent claudication ranges between 0.5 and 0.8.

Ankle brachial pressure index indicated that there was no significant difference in calf blood flow between the ipsilateral and contralateral leg to transplantation. The patients ankle brachial pressure index was 0.7. A resting ABPI of 0.9 is considered abnormal by Scottish guidelines [12], and various clinical trials have shown that a cut-off value of 0.9 is highly sensitive and specificity of angiography proven illness [13]. RRI is defined as the ratio of the difference between maximum and minimum (end-diastolic) flow velocity to maximum flow velocity computed from doppler measurements of the principal renal and intrarenal (segmental/interlobar) arteries. Normal RRI levels in people range from 0.47-0.70, with a 5-8% difference between two kidneys. Diabetes has an impact on both the micro and macro vasculature, RRI on the other hand, offers predictive information for both micro and macroangiopathy. RRI is thus measured by doppler ultrasonography in diabetic patients [14]. Regular and early screening for peripheral vascular disease and diabetes mellitus can detect and prevent renal graft rejection in renal transplant recipients.

## CONCLUSION(S)

Peripheral vascular disease can predict a poor outcome of renal transplant and indicate an impending renal graft rejection which was neglected and not reported by the patient in the present case until late stage, which led to autoamputation of toes in both feet. Regular screening through ankle brachial index is advised for peripheral vascular disease for prompt detection of renal graft rejection. So,

regular screening for peripheral vascular disease can detect and prevent renal graft rejection in renal transplant recipients.

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