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Sudden hypertension in a kidney transplant recipient after a skiing accident

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ABSTRACT

INTRODUCTION: Complications after renal transplants are frequent. A well-known but less frequent complication is arteriovenous fistula formation, which can remain asymptomatic or present with hematuria, hypertension, or renal insufficiency.

PRESENTATION OF CASE: We present the case of a young, male kidney transplant recipient with newly developed hypertension due to the formation of an arteriovenous fistula a long period after the last renal biopsy.

DISCUSSION: In our case, the sonographic evaluation showed the aliasing phenomenon, which was useful in the detection of the AVF. Superselective transcatheter embolization is considered to be the treatment of choice in such cases and has been proven to be safe and effective, even in long-term evaluations.

CONCLUSION: Our findings in this case highlight a rarely reported clinical presentation which physicians should be aware of when evaluating patients who have received a renal transplant.

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1. Introduction

The detection of hypertension in previously non-hypertensive patients after transplant surgery is a frequent complication encountered during the long-term evaluation of kidney transplant recipients. The development of hypertension in such patients can be attributed to several factors, including immunosuppressive medication, acute rejection, and deterioration of kidney allograft function [1]. We present the case of a young patient with a sudden onset of new arterial hypertension due to an arteriovenous fistula (AVF) which had developed in the transplanted kidney after a skiing vacation. Generally, renal biopsy induced AVF in kidney transplant recipients develops within a few days of the interventional procedure [2]. However, in this case, the last protocol biopsy had been performed more than two years before the detection of hypertension and closed meshed ultrasound follow-ups every 3 months had excluded AVF up until that time. Thus far, no studies or reports have been published on the occurrence of symptomatic AVF in kidney transplant recipients a few years after the last biopsy. Moreover, our case outlines the importance of ultrasound examination and

the typical findings recorded during follow-up evaluation of kidney transplant recipients.

2. Presentation of case

A 22-year-old male kidney transplant recipient presented with a hypertension for the last two weeks. The patient had documented blood pressure levels of 124/68 mmHg and 148/84 mmHg before and after the skiing vacation. During his vacation, a minor skiing accident had occurred during which the patient tumbled onto his ski pole and sustained small bruises on his lower abdomen. The patient had received a living donor kidney transplant from his mother five years ago and had maintained stable graft function, with a creatinine level of 1.5 mg/dl until the appearance of hypertension. The immunosuppressive therapy comprised tacrolimus and mycophenolic acid. Notably, the patient's records showed a biopsy-proven cellular rejection two months after transplantation and several, subsequent protocol biopsies to exclude chronic allograft nephropathy. The latest biopsy was performed two years before presentation and was followed by gross hematuria.

On clinical examination, a blood-flow murmur was noted by auscultation over the region of the transplanted kidney in his lower abdomen. Laboratory tests revealed that the patient's serum creatinine level was 1.7 mg/dl and that his tacrolimus trough level had remained unaltered, at 5.0 ng/l.

Finally, a duplex ultrasound (9 MHz curved array) of the transplanted kidney was performed, which revealed a hyperperfused

Abbreviations: AVF, arteriovenous fistula; BMI, body mass index; TEA, transcatheter arterial embolization with platinum coils.

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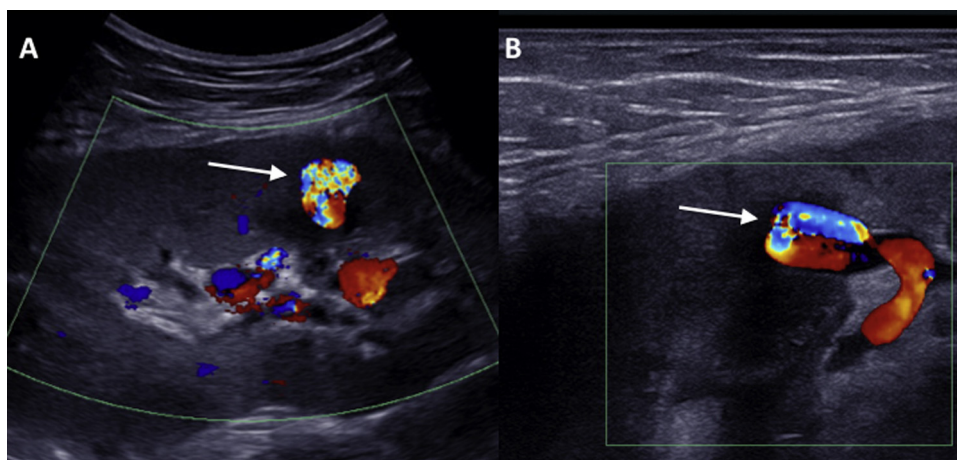


Fig. 1. Duplex ultrasound images of the kidney allograft with 9 MHz curved array (A) and 14 MHz array (B) showing turbulent flow (arrow) in the cortex of the lower renal pole.

round structure with the aliasing-phenomenon in the region near the lower pole of the allograft (Fig. 1A). Further detailed ultrasound examination (14 MHz linear array) showed the presence of dilated vessels within the cortex of the grafted kidney and color aliasing in a vessel loop formation (arrow, Fig. 1B), findings that were consistent with an arterio-venous fistula formation.

After transcatheter arterial embolization with platinum coils (TEA) (Fig. 2A and B) the patient’s blood pressure dropped to baseline values within a few days. At the last follow-up, the patient’s creatinine levels had remained stable, at 1.6 mg/dl, despite a parenchyma perfusion deficit after the intervention (Fig. 3).

3. Discussion

AVF formations after renal biopsy have been reported to occur in 18% of the cases and may remain asymptomatic or give rise to hematuria, hypertension, and/or renal insufficiency [3]. Risk factors for the development of AVF have been identified as female gender, biopsy from the right side in women, young age, and low body mass index (BMI) [4]. A similar case of delayed development of AVF about 10 years after the last renal biopsy was reported; however, the

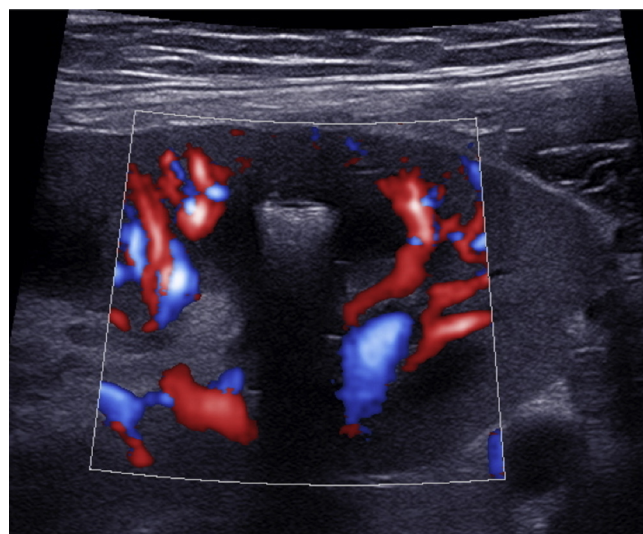


Fig. 3. Follow up ultrasound.

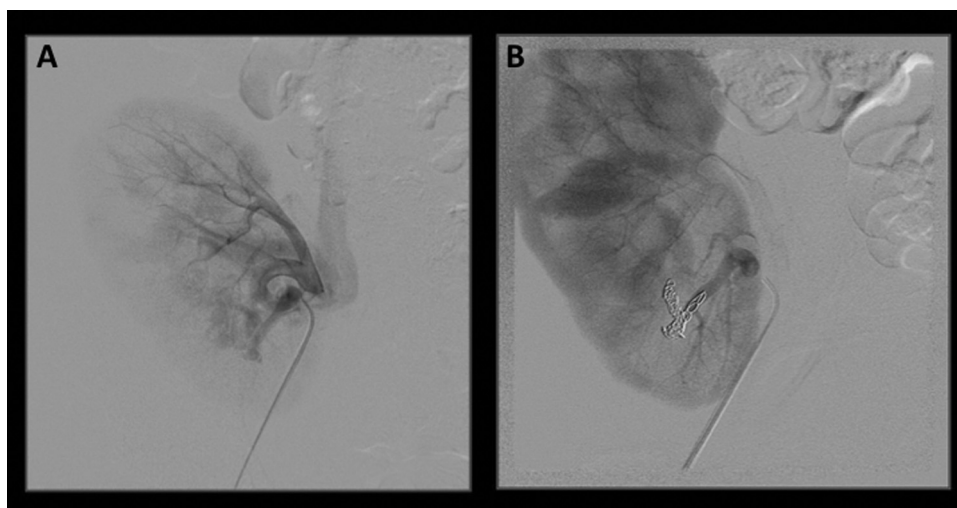


Fig. 2. Digital subtraction angiography before (A) and after (B) intervention. Digital subtraction angiography prior to intervention shows rapid efflux of the contrast agent into the iliac vein before complete perfusion of the whole kidney (Fig. 2A arrow) due to the fistula. After successful coiling of the feeding artery with platinum coils (Fig. 2B, circle), the kidney parenchyma is contrasted prior to efflux of the contrast agent into the iliac vein (Fig. 2B, arrow).

patient in that case presented with hematuria, whereas our patient presented with hypertension [5]. Contrast-enhanced ultrasonography has been reported to be useful in the evaluation of post-biopsy AVF in transplant patients [6]. In our case, the sonographic evaluation showed the aliasing phenomenon, which was useful in the detection of the AVF. Superselective transcatheter embolization is considered to be the treatment of choice in such cases and has been proven to be safe and effective, even in long-term evaluations [2]. Consistent with these reports, arterial embolization was successful in this case. Thus, careful evaluation and monitoring of patients, particularly those with newly developed hypertension, would help in the detection of AVF. In fact, a recent review advocates the use of 24 h ambulatory blood pressure monitoring, both at work and at home, as well as during the day and the night in transplant recipients [2]. Such measures may enable the early detection of hypertension and allow for the planning of appropriate treatment measures [7].

4. Conclusion

In conclusion, we presented an unusual case of AVF formation in a patient almost two years after the last renal intervention which showed no radiographic evidence until the last follow-up before the occurrence of a triggering incident. Our findings highlight the possibility that AVF may occur years after the last renal invasive investigation in renal transplant patients and is an indicator that thorough evaluation of the patient is necessary and may enable the implementation of suitable corrective measures. Presented case has been reported in the line with the CARE criteria [8].

Disclosures

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Conflict of interests

Authors have no conflict of interest to declare.

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Ethical approval

No ethical approval needed for this manuscript.

Consent

Written consent has been obtained from the patient for publishing the case and for the use of pre- and postoperative photos for publication purpose. All specific patient information is deidentified.

Author contributions

All authors have contributed equally to the above.

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