

Case Report

"Pseudoaneurysm complicating organ transplantation - Role of duplex sonography and MR angiography"

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Abstract

We report a case of surgically proven pseudoaneurysm of transplanted renal artery. The 16 yr old patient had presented with rising creatinine for last 2 months and swelling of the face for 1 month. USG revealed a well defined cystic area in antero-medial aspect of transplanted kidney (near the renal hilum). Doppler & MR angiography confirmed a case of pseudoaneurysm. Repair of transplanted renal artery pseudoaneurysm with right internal iliac to common femoral artery bypass grafting done.

Keywords: extra-renal pseudo aneurysm; renal transplantation; doppler ultrasound; MR angiography

Introduction: The development of advanced spectral & color Doppler ultrasonographic technology as well as MR angiography has permitted the successful non-invasive identification and monitoring of the complications.

Extra renal pseudoaneurysms are much less common, have different causes and have a much poorer prognosis. They are usually associated with renal artery anastomotic failure. Because of the inherent risk of rupture and exsanguinations (esp. in extrarenal variety), the timely treatment of these entities has been advocated.

Case report

A 16 yrs old girl with end stage renal disease received a kidney (from unrelated donor) transplant in 20.09.2006 in Pakistan. Immediately after transplant her serum creatinine was 1.0 but for last 2 month prior to admission she was having chronic graft dysfunction. She came to OPD with C/o high creatinine & swelling of the face. She was advised to get an USG along with other investigations.

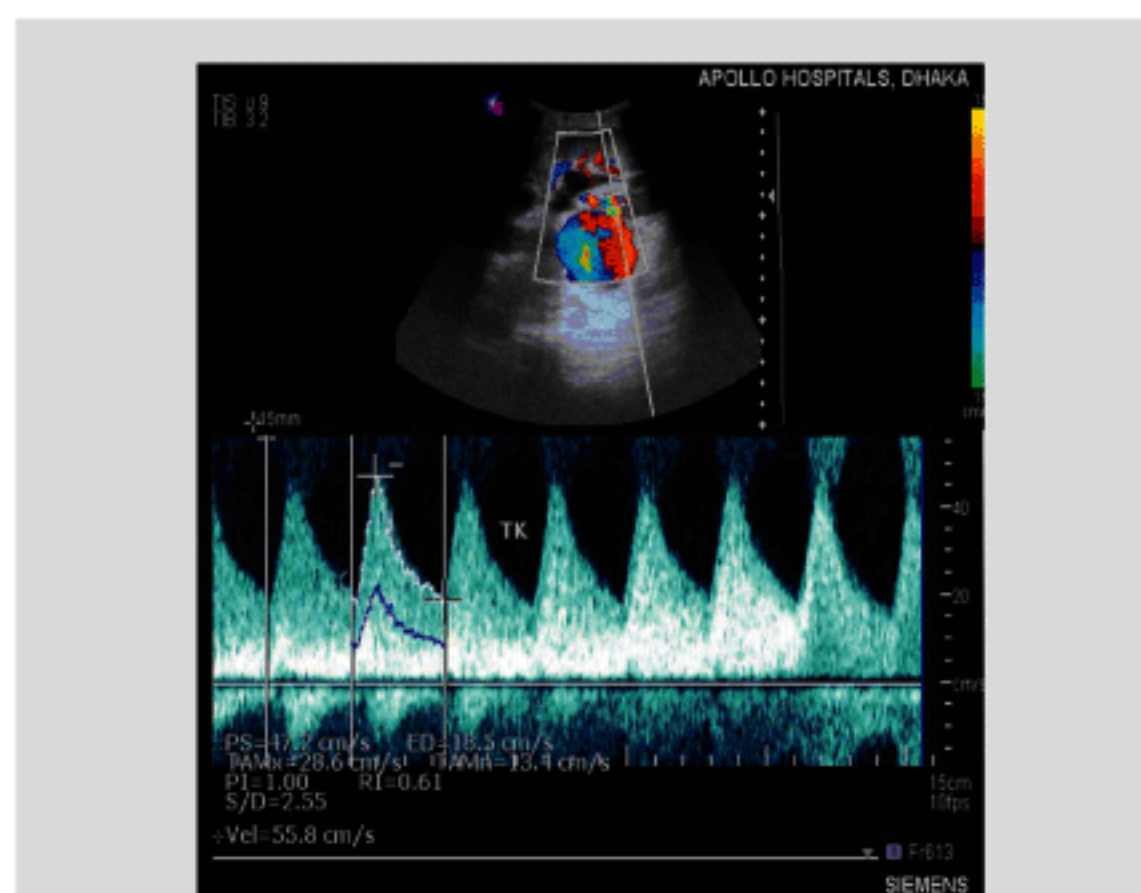


Figure 2: Doppler pulsatility indices (PI) and Resistive index (RI) of transplant kidney. Arterial pulsation with bidirectional color assignment within the PSM.

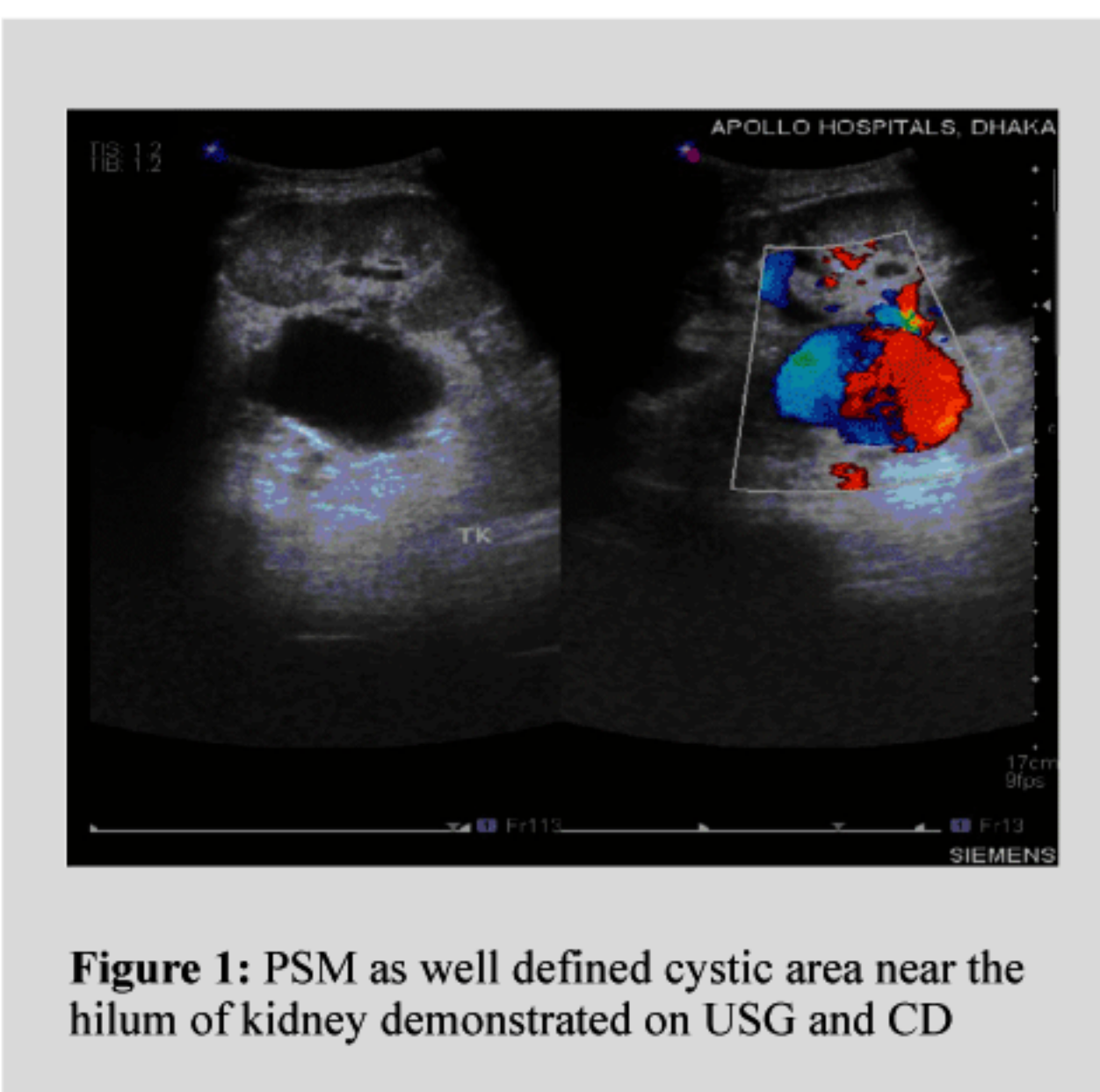


Figure 1: PSM as well defined cystic area near the hilum of kidney demonstrated on USG and CD



Figure 3: T2 W coronal image large pseudoaneurysm compressing renal perfusion

Pseudoaneurysm



Figure 4: PSM around the hilar region of transplanted kidney, MR angiography coronal fl 2d and sagittal MIP.

USG revealed a well defined cystic area in antero-medial aspect of transplanted kidney (near the renal hilum) and color doppler study confirmed a large pseudoaneurysm of transplant renal artery (measuring 4.56 cm x 3.1 cm, vol - 27.8 cc) and showing arterial pulsation with bidirectional color assignment within it.

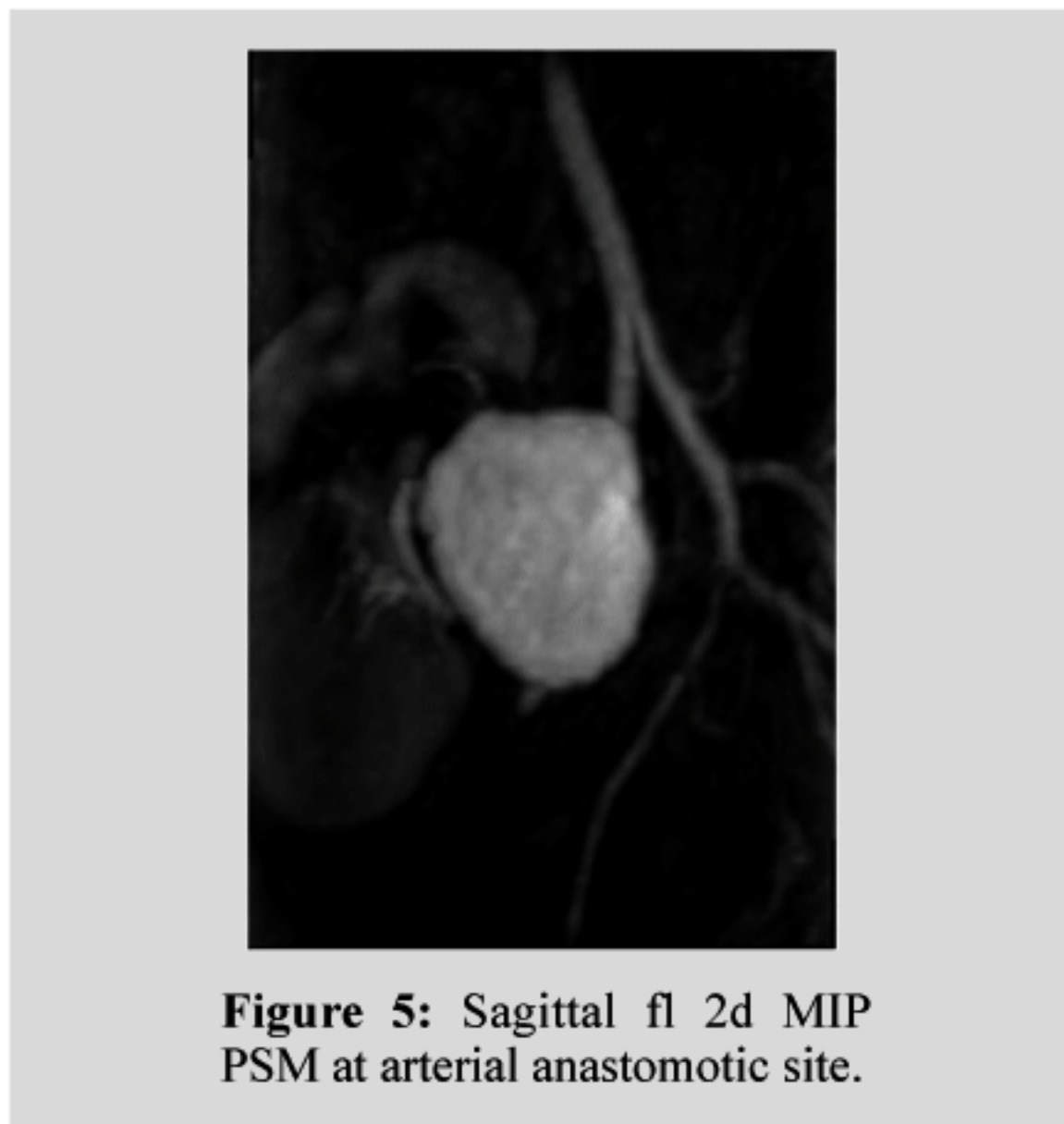


Figure 5: Sagittal fl 2d MIP PSM at arterial anastomotic site.

After admission MR angiography was done & it detected large pseudoaneurysm which was compressing renal perfusion. Surgery was done on 04.12.2006, found a pseudoaneurysm around the hilar region of transplanted kidney, at the arterial anastomotic site. We repaired transplanted renal artery pseudoaneurysm with right

internal iliac to common femoral artery bypass grafting.

Discussion: In renal transplant recipients vascular complications are a significant cause of graft loss & dysfunction. The most common vascular complication is renal artery stenosis (1.5 -10 % of the patient), less common vascular complications included-venous thrombosis, arterio-venous fistula, pseudo aneurysm. Pseudoaneurysm in renal artery allograft may form at the arterial anastomotic site, occur after renal biopsy or due to infection. Because pseudoaneurysms are commonly asymptomatic & detected on imaging studies performed for other reasons; diagnosis requires close scrutiny of arterial anastomosis, bed of infection or recently sampled for biopsy. Any abnormal hypoechoic or anechoic collection in these areas must be evaluated with Doppler for evidence of arterial flow. Detection of arterial flow is an indication for angiography.

Additionally, a 5 mm pseudoaneurysm went undiscovered by Doppler study, to be later identified at MR angiography. Therefore, it is reasonable to assume that the threshold for the discovery of pseudo aneurysm by Doppler sonography lies somewhere between 5 mm-30 mm size. Extra renal pseudoaneurysms may be more easily depicted by virtue of its location outside the renal capsule, away from the confounding signal produced by the renal parenchyma blood flow (5).

Accurate imaging of the transplanted kidney is critical for implementing effective treatment. USG is usually performed for initial detection of any abnormality including transplant arterial & venous patency and

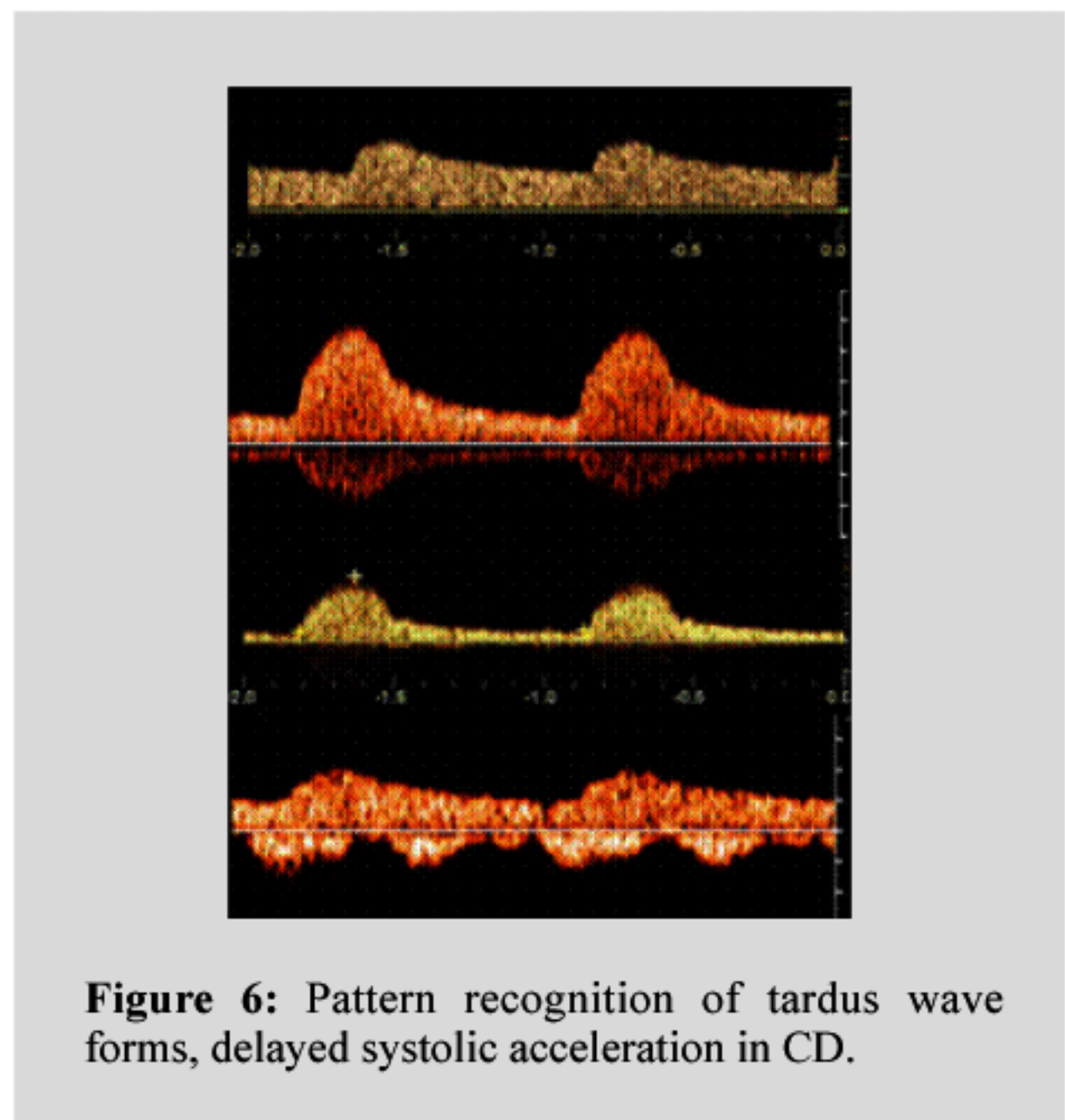


Figure 6: Pattern recognition of tardus wave forms, delayed systolic acceleration in CD.

Pseudoaneurysm

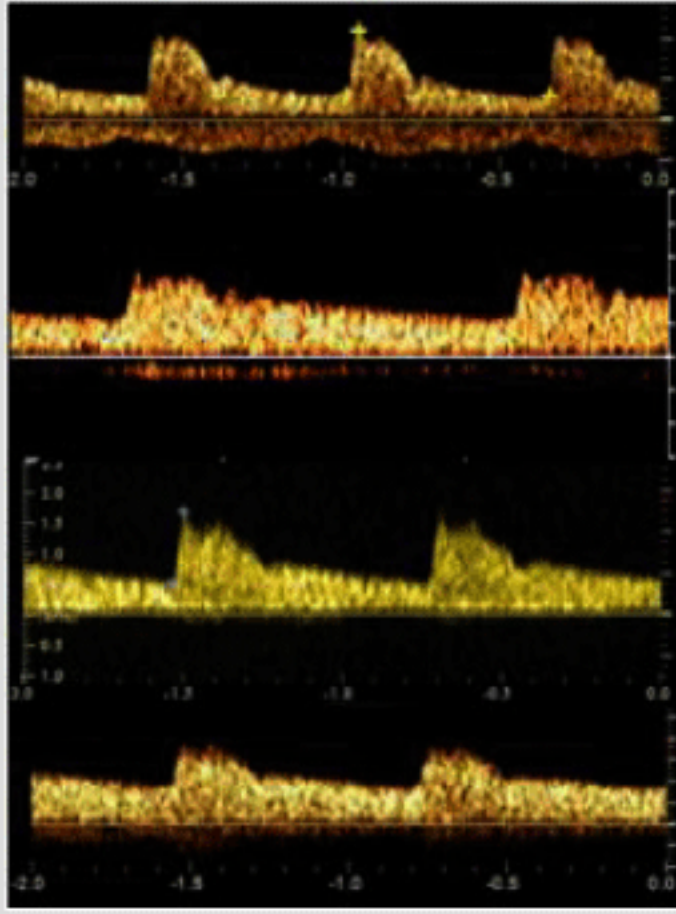


Figure 7: Segmental artery waveforms in CD.

determining Doppler indices. However, USG is operator dependent and the main transplant artery is often incompletely visualized.

Several studies have demonstrated the usefulness of MR angiography in the evaluation of the transplanted renal artery. (Most of these studies use MR angiography with maximum-MIP and multiplanar volume reformation-MPVR technique).

Conclusion: Consideration of routine ultrasonographic evaluation of renal allograft & continued improvement in spectral color Doppler technique as well as prompting MR angiographic evaluation may assist in discovery of more cases of extra renal pseudoaneurysm so that treatment criteria can ultimately be defined.

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