

# Post transplant urinary tract infection in Autosomal dominant polycystic kidney disease a perpetual diagnostic dilemma - 18-fluorodeoxyglucose - Positron emission computerized tomography - A valuable tool

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## ABSTRACT

Urinary tract infection (UTI) is the most common infection contracted by renal allograft recipients. In patients of autosomal dominant polycystic kidney disease (ADPKD), cyst infection presents a complex diagnostic and therapeutic challenge especially in the post transplant period. Accurate diagnosis forms the cornerstone in salvaging the graft from potentially catastrophic outcome. We describe a case of xanthogranulomatous pyelonephritis (XPN) in the native kidney in a patient of post transplant ADPKD which presented as frequently relapsing UTI with graft dysfunction where in accurate diagnosis was made possible with the aid of 18-fluorodeoxyglucose (FDG) - Positron emission computerized tomography (PET/CT).

**Keywords:** ADPKD, PET/CT, transplantation, UTI, xanthogranulomatous pyelonephritis

## INTRODUCTION

Urinary tract infection (UTI) is the most common infection contracted by renal allograft recipients. In patients of autosomal dominant polycystic kidney disease (ADPKD), cyst infection presents a complex diagnostic and therapeutic challenge, especially in the post transplant period.<sup>[1]</sup> The mortality associated with bacteremia is around 11% during this period. Consequently, early and reliable detection of infected renal cyst is crucial for optimal patient management, especially when initial antibiotic therapy has failed. Xanthogranulomatous pyelonephritis (XPN) is an unusual variant of chronic pyelonephritis. Most cases occur in the setting of obstruction

due to infected renal stones.<sup>[2]</sup> It has been infrequently reported in the post transplant scenario or in the ADPKD patients. We report a case of post transplant XPN in the native ADPKD kidney presenting as relapsing UTI. 18-fluorodeoxyglucose (FDG)-Positron emission computerized tomography (PET/CT) scan allowed the exact localization of the infection in the renal parenchyma and guided the therapeutic procedure with subsequent resolution of UTI.

## CASE REPORT

A 53-year-old male of ADPKD-CKD on maintenance hemodialysis since one and half years received a deceased donor renal transplant at our institute. His other co morbidities included diabetes mellitus and hypertension since the last eight years. His postoperative recovery was uneventful and he was discharged on tenth post transplant day with a serum creatinine of 1.2 mg/dl. He presented two weeks later with complains of fever, malaise and dysuria. On clinical examination, he was hemo-dynamically stable but febrile. Laboratory parameters included hemoglobin 10.2 gm/dl, leukocytes 8,600/cmm, platelets 2.9 lacs/cmm, glucose 186

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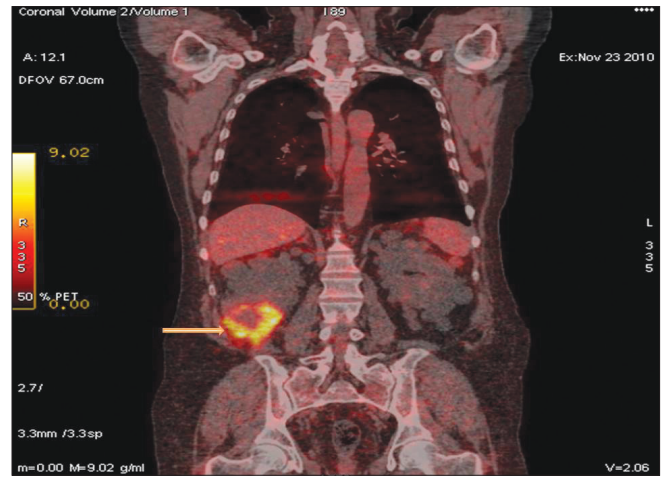
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mg/dl, urea 18 mg/dl, serum creatinine 1.7 mg/dl, sodium 138 meq/l, potassium 4.3 meq/l. Urine analysis showed, albumin 1+, 40-50 leukocytes /high power field (HPF), red cells 4-5/hpf, no casts, bacteria, acid fast bacilli or fungus were found. Blood and urine cultures were negative. Chest X-ray was normal, abdominal ultrasonography showed multiple hepatic and renal cysts in native kidneys, but was not suggestive of any infection, graft kidney was unremarkable. He was treated with antibiotics and responded well to the same and later discharged. Over the next three months patient presented twice with symptoms of UTI and the urine cultures on both occasions grew *Escherichia coli*. He was evaluated with ultrasonography and unenhanced computerized tomography (CT), which revealed a normal transplant kidney and multiple cysts without evidence of any infection, hemorrhage or calculi in native kidneys. Subsequently, patient underwent cystoureteroscopy with bilateral selective urine sampling from native kidneys, however culture revealed no growth. In an attempt to localize the source of infection, FDG PET/CT SCAN was done. It showed hyper-metabolic lesion arising in postero-inferior part of right native kidney [Figure 1]. PET/CT guided aspiration revealed purulent fluid, culture of the same yielded heavy growth of *E. coli*. On the basis of these findings, patient was subjected to right native kidney nephrectomy. The cut section of the gross specimen showed xanthomatous area [Figure 2] and the histopathology was suggestive of XPN [Figure 3]. Patient made a good recovery with S. creatinine returning to 1.3 mg/dl and urine culture being sterile on subsequent follow-up of three months.

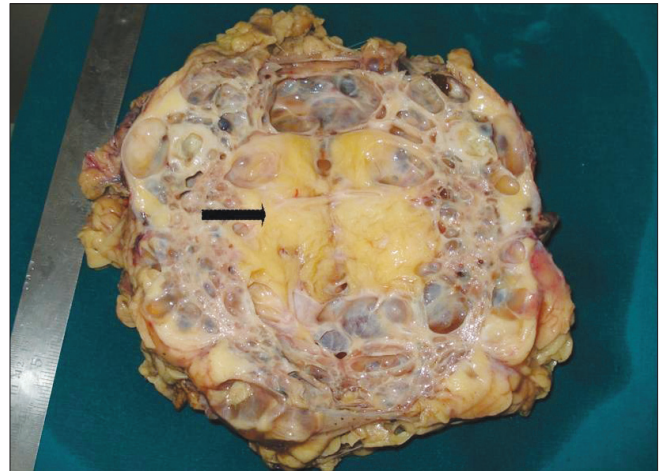
## DISCUSSION

Renal transplantation in ADPKD patients presents unique challenges to the transplant physician. Febrile illness owing to complicated UTIs secondary to renal or hepatic cyst infection is a common cause of graft dysfunction. If not localized early and redressed they can be a source of significant morbidity especially in an immuno-compromised host.

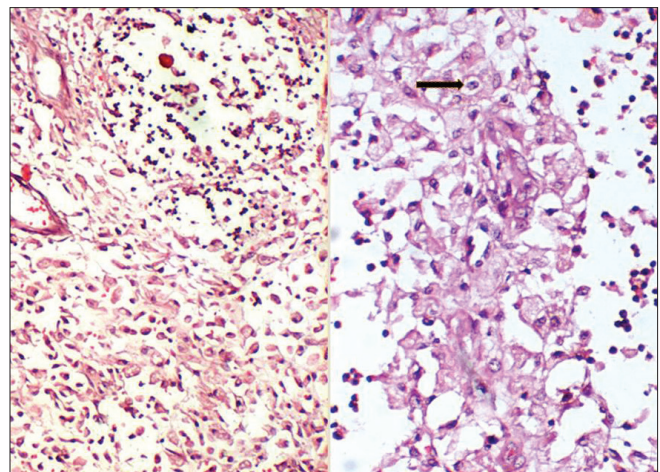
XPN is a rare cause of UTI. It is characterized by replacement of renal parenchyma with diffuse or segmental cellular infiltrate of lipid laden macrophages called foam cells. The diagnosis of XPN is confirmed by CT imaging and pathology.<sup>[3]</sup> Here, we report a case of rare occurrence of XPN in native polycystic kidney of a renal allograft recipient. In the literature, XPN in ADPKD either in transplant scenario or otherwise has been infrequently reported.<sup>[4-6]</sup> In our case, conventional CT scan was non-contributory, however FDG PET/CT scan was helpful in localizing the site of infection. As the patient was not responding to conservative management it was decided to proceed with nephrectomy of infected kidney. XPN was subsequently established on evaluation of gross specimen [Figure 2] and histopathology [Figure 3]. FDG PET/CT scan in the recent times has emerged as a valuable tool for the transplant physician in localizing of infections especially in ADPKD patients.<sup>[7]</sup> PET/CT can overcome interpretive



**Figure 1:** PET/CT scan showing strong FDG uptake into postero inferior part of right native kidney (arrow)



**Figure 2:** Gross section of Right kidney showing xanthogranulomatous area (arrow)



**Figure 3:** Light micrograph showing an interstitial infiltrate composed of neutrophils, mononuclear cells, and, most characteristically, lipid-laden macrophages (arrow). (H and E, ×100)

challenges in identifying tissue infection, based on the high metabolic activity and increased uptake of the glucose-analogue FDG by inflammatory cells.<sup>[8]</sup>

## CONCLUSION

Post transplant, UTI especially in the ADPKD patients is challenging to the transplant physician. This case highlights the rare occurrence of XPN as a cause of post transplant UTI, especially in the absence of obstruction or stone disease. FDG PET/CT imaging is a valuable tool in both localization and subsequent planning of therapeutic interventions for complicated UTIs associated with ADPKD transplant patients.

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