ISSN: 2755-0117

Journal of Oncology Research Reviews & Reports

SCIENTIFIC Research and Community

Case Report

Open Access

Bilateral Papillary Renal Cell Carcinoma in the Native Kidneys after Ten Years of Renal Transplantation: Report of a Case and Review of the Literature

Haytham Araibi

Urology, Kidney Transplantation Department, Assistant Professor University of Khartoum, Khartoum Sudan

ABSTRACT

I am presenting a case of bilateral native kidney papillary RCC, after 10 years of living donor kidney transplant. The patient received the regular immunosuppressant regimen, and was on regular post-operative follow up. During one of the follow up visits, the CT scan showed bilateral cystic masses bilaterally in the native kidneys. He underwent bilateral open radical nephrectomy in the same session. The histopathological examination of the specimens showed bilateral cystic lesions with exophytic masses in both kidneys, which proved to be papillary RCC.

***Corresponding author**

Haytham Araibi, Urology, Kidney Transplantation Department, Assistant professor University of Khartoum, Khartoum Sudan.

Received: October 15, 2026; **Accepted:** October 19, 2026; **Published:** October 29, 2026

Keywords: RCC, Native Kidneys, Transplantation, Papillary RCC

Abbreviations

ACKD - Acquired Cystic kidney Disease
AMACR - Alpha-Methyl Acyl-CoA Racemase
BMI - Body Mass Index
Bcl-2 -B Cell Lymphoma
CD - Cellular Differentiation
ccRCC - Clear Cell RCC
CT scan -Computer Tomography
ESRD - End Stage Renal Dysfunction
H&E - Haematoxylin and Eosin
HLA - Human Leucocyte Antigen
MLCRCC - Multilocular Cystic Renal Cell Carcinoma
MEST - Mixed Epithelial and Stromal Tumour
MRI - Magnetic Resonance Imaging RCC _ renal cell carcinoma

Introduction and Literature Review

In spite of the fact that, renal transplant has improved both the quality of life as well as life expectancy of patient with chronic kidney disease on dialysis, but still, these doesn't match the figures of general population. One of the major contributing factors, is that, these patients have tendency to develops malignancies. The overall number reaches about 2-4 folds when compared to general population, and with regard to renal malignancy, this may reach about 15-fold [1-3]. This is suggested to occur as a result of the immunosuppressant's, which is used extensively in renal transplant patients. The most common type of tumours in renal transplant patients, are skin cancer and non-Hodgkin's lymphoma, with renal cell carcinoma represent about 5% of tumour detected in transplant patients [4]. As well there is some report of 100-fold increase risk of native kidney malignancies, doublet et al [5]. Post transplant kidney malignancy almost always arises in the native kidneys, with only few reports its development in the allograft [6-9]. Polycystic kidney disease is one of the major factors associated with the development of renal cell carcinoma it is found in about 70-90 % in the surgical autopsy biopsies post surgically [10,11]. The loss of tubules, induce the growth of cysts and compensatory hyperplasia within the kidney, which is regulated by growth factors and firing of proto-oncogenes [12,13]. The renal tumours arising in the polycystic kidneys, tend to be of papillary type [14,15]. This case report describes one the most rare cases, a post kidney transplant native kidneys bilateral RCC, occurring after ten years post donor kidney transplantation.

The case is of 48 years male, presented with incidentally discovered bilateral native kidneys masses on follow up CT scan of the abdomen. He underwent living donor renal transplant 10 years back. The intra-operative findings, was bilateral renal masses, with the histopathology examination concluded Bilateral papillary RCC.

Case Presentation

Patient Information	**Age: 48 years**
	Male
	Farmer
	Gezira State, Sudan
Presenting Complaint:	Weight loss for 3 months

History of Present Illness

The condition started 3 months prior to admission, with gradual onset loss of body weight observed by the patient and his wife. On regular follow up CT abdomen was done, in which bilateral native kidney masses was discovered. There was no associated hematuria

or dysuria, no renal colic or lower urinary tract symptoms, no abdominal swelling. There was no symptoms suggestive of distant metastases (no cough or shortness of breath, no abdominal pain or jaundice, no headache or convulsions, no bone pain).

The patient was diagnosed as a case of end-stage renal disease of unknown etiology and underwent living kidney donor transplant 10 years back. He was on regular immunosuppressant drugs and follow up in the transplant unit – Ibn Sinna Hospital. The immunosuppression received was the standard regimen, which included calcineurin inhibitors (cyclosporin A; tacrolimus), mycophenolate mofetil, and prednisolone.

Past Medical History

- Diagnosed as systemic hypertension –since 2005 –was on amlodipine 5 mg once /day.
- Living Kidney transplant -10 years back –at Ibn sinna Hospital-Kidney Transplant Unit.

Family History

- No History of Chronic Kidney Disease or Polycystic Kidneys.
- Positive family history of hypertension, from his mother side, in addition his sister diagnosed as uterine malignancy, underwent hysterectomy-bilateral oophorectomy, now alive and well.

Physical Examination

Patient Looks Well Not Pale or Jaundiced	
Vitally Stable, Pulse Rate: 82 Beats /Min	**Blood Pressure:** 130/80
Weight: 59 kg	**BMI:** 19
Chest Examination	**Inspection:** Normal equal chest movement. **Palpation:** Central trachea, normal bilateral chest movement.
	Percussion: Normal percussion note. **Auscultation:** Equal air entry, no added sounds.
Abdominal Examination Distribution.	**Inspection:** Normal contour, normal adult hair **Palpation:** Soft lax no tenderness, there is palpable right loin mass, hard, mobile, bimanually palpable and ballotable. Auscultation: Normal audible bowel sounds, no vascular bruit.
Scrotal and Testicular Examination	**Right Scrotum:** Normal size testes and cord no masses or hydrocele, normal scrotal skin. **Left Scrotum:** Normal testes is palpable, Grade IV testicular varicocelle, increases on standing up and valsalva manoveur.

Laboratory Tests	
CBC – Hemoglobin	13.5 gm/dl.
RFT – Creatinine	1.2 mg //dl.
S. Urea	10 mg /dl.
LFT – ALT/AST/ALP	All within Normal Limit.
S. Bilirubin	1.5 mg/dl.
PT	11 seconds.
APTT	28 seconds.
Urine General	Pus cells 12.
	RBCS <5.
Tumor Markers	AFP 20 Ug/L.
	-LDH 2 IU/L.
	B-HCG 7 ukat/L.

Imaging Studies

CT urography scan showed, bilateral multiple radiolucent cystic Lesions, some of them with solid elements and contrast enhancement. Some of the cyst graded as Bosniak 2A, some are 5.Both kidneys are atrophied with features consistent with CKD.

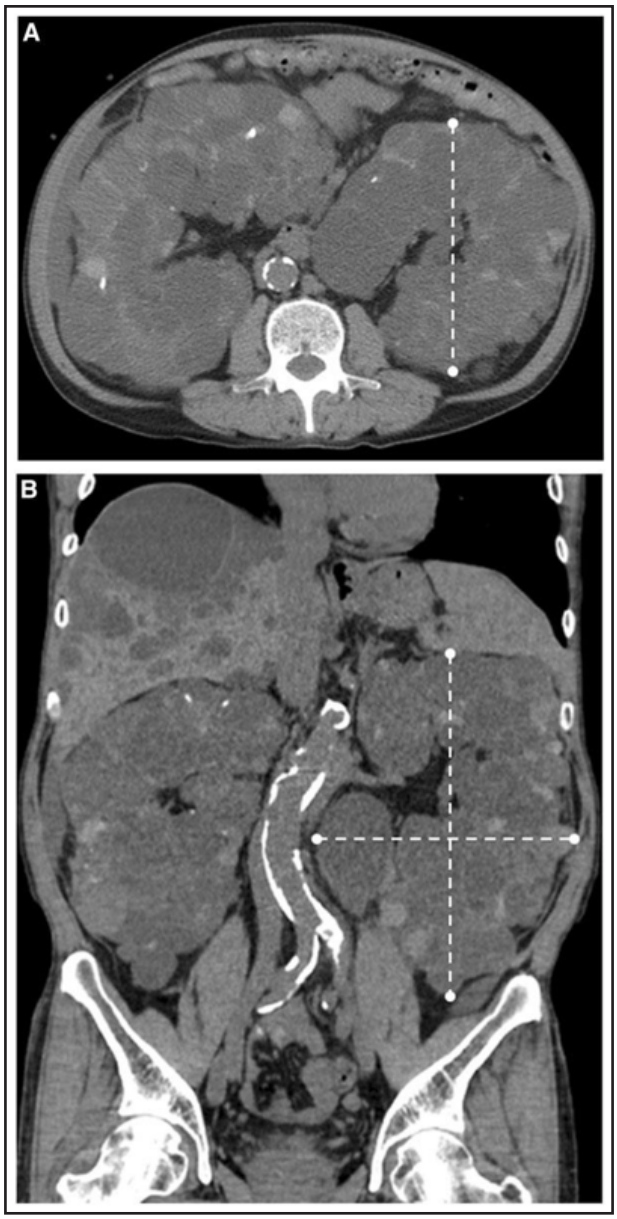


Figure 1: Computed Tomography Showing Innumerable Cysts of Variable Size in Both Kidneys and the Liver. (A) Axial and (B) Coronal Unenhanced Computed Tomography Showing Enlarged Kidneys and Multiple Liver Cysts. The Three Greatest Diameters of the Kidney are Indicated by Dashed Lines. No Tumors were Identified in other Organs [16].

Operative Findings

The patient was formerly consented for all the proposed operative steps and the possible complications.

The Type of Anesthesia General Anesthesia

Supine Position

Midline laparotomy incision, regular laparotomy check for evidence of metastases (palpation of the liver ,lymph nodes), both kidneys identified , started by the right kidney with the largest tumor mass, mobilization of the right hemi colon and duodenum kocherization, then regular radical nephrectomy, regional lymphadenectomy was done, the same steps repeated on the left kidney, the transplanted kidney identified and examined, was grossly normal, the specimens sent for histopathology examination, and the patient referred to oncology department for further management and follow up .

The patient recovered well post operatively without complications, and the tissue sent for histopathology examination.

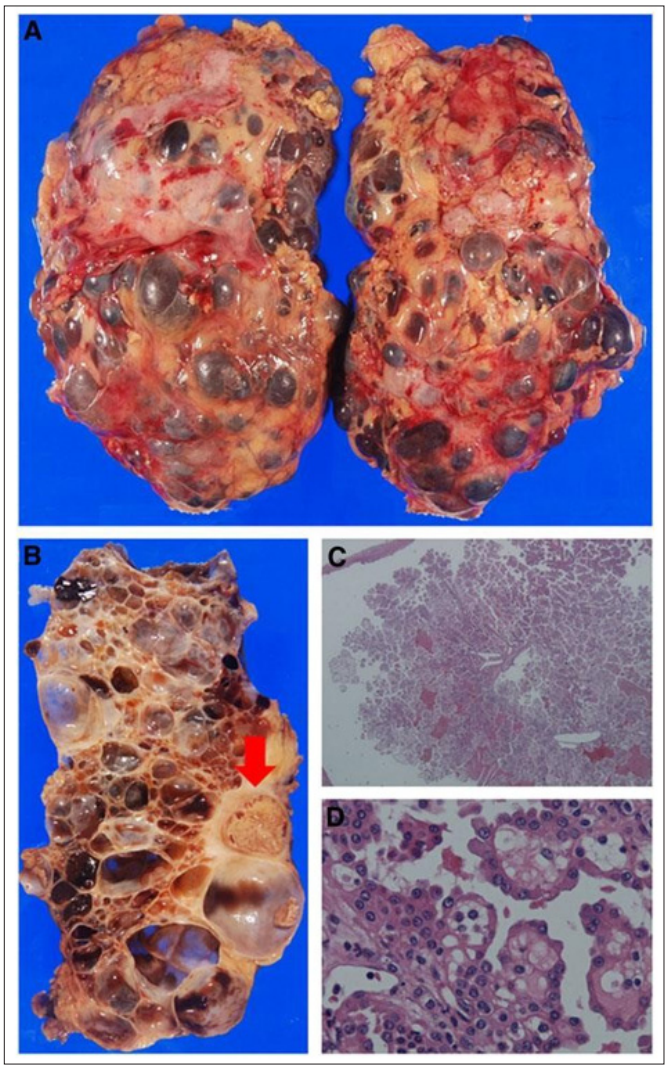


Figure 2: Kidney Specimens and Tumor Histopathology. Kidney Specimens from a Patient who Underwent Simultaneous Bilateral Nephrectomy and Histopathologic Findings of the Left Kidney Tumor. (A) Right Kidney Measured 26 × 16 × 13cm and Left Kidney Measured 28 × 17 × 13cm. (B) Cross-Section of the Left Kidney Shows a Slightly Yellow Solid Tumor (arrow)
(C) Hematoxylin-Eosin Stain, Original Magnification × 100 and (D) Hematoxylin-Eosin Stain, Original Magnification × 400 Show Papillary Renal Cell Carcinoma with Large Columnar Cells with Eosinophilic Cytoplasm
and Edematous or Fibrous Thick Stalks [16].

Histopathology Results

Macroscopic Findings

The left kidney, multiple cysts identified. The largest about 3 cm. The kidney Is below the average in size (6*4*3 cm). There is one exophytic central mass with cystic components (3*4 cm). The right kidney also shows multiple cystic lesions. The largest about 4 cm in the lower pole there is an exophytic solid mass (5*4 cm). This is surrounded by multiple cystic components.

Microscopic Findings

Left Kidney

The central component, showed cells of intermediate and small sizes, with eosinophilic cytoplasm, multiple mitotic figures, nuclear atypia.The diagnosis is papillary multifocal RCC. Fuhrman's grade

1-2. The cysts and cystic components, some are Fully capsulated, other are partially.

RT Kidney

The cystic lesions are well capsulated. The solid lower polar mass, also Showed small size cells, eosinophilic cytoplasm, pyknosis, nuclear atypia and multiple mitotic figures. The diagnosis is papillary multifocal RCC. Fuhrman's grade 1-2. The tumour in both sides showed few amounts of fibrotic stroma, tubules, and acini. There was no lymphovascullar invasion, sarcomatous components or necrosis. The immunohistochemistry staining showed positive to cytokeratin and cadherin, but negative to RCC antigen.

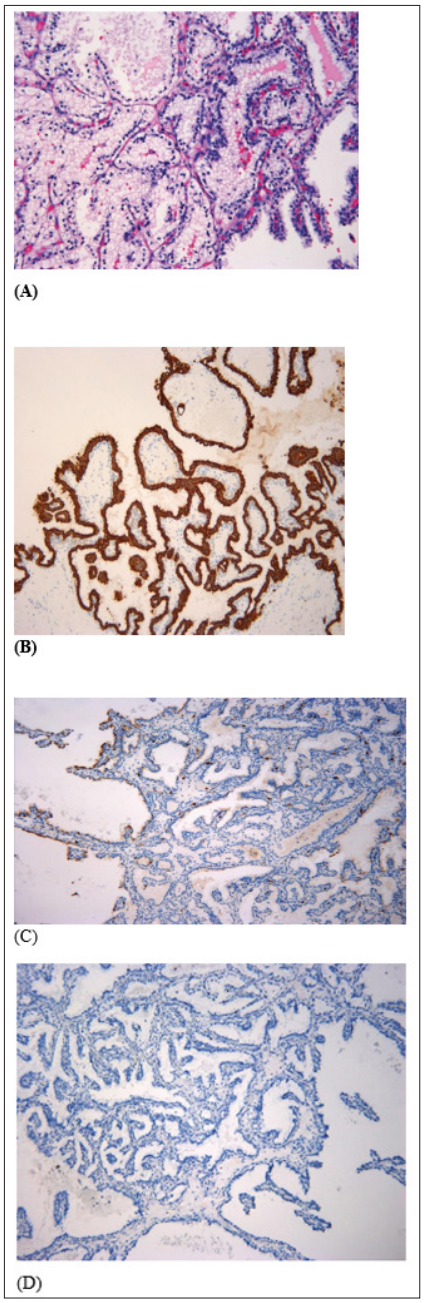


Figure 3: Clear Cell Papillary Renal Cell Carcinoma in Native Kidneys of a Renal Transplant Recipient. (a) Single Layers of Clear Cells with Moderate Amount of Clear Cytoplasm and Pyknotic Nuclei Oriented Toward the Apical surfaces, H&E 400×; (b) Diffuse CK7 Positivity, 100×;(c) Weak CD10 Stain, 100×; (d) Negative RCC Stain, 100× [17].

Discussion

Papillary subtype of RCC is described to be of lower grade and indolent course [4,5,7-9]. Usually as one of the complications of CKD [9]. But still it can occurred de novo [5]. The microscopic features of the papillary subtype does not entitles the aggressive features of lymphovascular invasiveness, sarcomatoid features or necrosis [4]. The papillary tumour of the CKD kidneys is usually cystic and contains acini, papillae, tubules and clear cell nests [4]. Branching tubules and clear cell ribbons are reported to be the characteristic morphologic patterns [4]. All of these covered with single layer of tumour cells. The cytological features includes low nuclear grade, average size cytoplasm. The nuclei were more closed to the apical than the basal membrane.

The immune phenotypic features of the tumour cells, while they are diffusely positive for CK7, but negative for alpha-methyl acyl-CoA racemase (AMACR), and for CD10 [4]. The stain differently for carbonic anhydrase IX (CA9).

Papillary RCC are usually of low pathologic stage. One study has reported 80/ 82 as pathologic stage 1 and the remaining 2 tumours as pathologic stage 2 tumours [4, 5, 7-10]. Our case is pathologic stage 1. They also have an indolent clinical course. Another study Followed-up 40 cases (mean period 28 months), in cases underwent radical treatment, there was no detected disease progression or recurrence during the whole follow up period [4]. The above-mentioned patient is now clear of recurrence or progression for a period of 36 months. One of the main pathognomic feature of the papillary RCC is the papillary architecture. Although the presence of tubules and cysts lined with the tumor cells can confuse them with the conventional CCRCC, but papillary RCC usually lacks the delicate sinusoidal vascular networks seen in the conventional CCRCC. On the other hand CCRCC lacks the branched tubules and complex clear cell ribbons seen in papillary RCC. The immune

Histochemical stains is usually used to differentiate between the two, while the CCRCC is usually positive for RCC, CA9, and CD10 and negative for CK7 while papillary RCC is diffusely positive for CK7, commonly negative for CD10, and variably positive for CA 9 Other types of renal tumors may looks similar (multilocular cystic renal cell carcinoma (MLCRCC) and mixed epithelial and stromal tumour (MEST) MLCRCC is a variant of CCRCC with multilocular cystic growth pattern. The cysts are lined by clear cells with low nuclear grade [13, 14]. Genetically, MLCRCC also has chromosome 3p alteration [13]. Although CCPRCC can have abundant smooth muscle stroma, it does not, however, have the overall characteristic morphology of MEST.

Transplants of solid organs are known to be prone to develop variety of solid organ tumors, which are usually aggressive in nature [1]. This is estimated to be two to three folds increase in renal transplant patients compared to general population [2,3]. Different types of renal malignancies increase by 15-fold [18]. Of these conventional RCC is reported to be about two thirds of the cases, while papillary only one third [19]. RCC which arise after organ transplantation is known of its aggressive course [20,21]. This could be attributed to the immune suppression treatment. Our patient was on regular follow up for up to 10 years before the disease been discovered, which is considered a long window period.

The role of immunosuppression in the development of RCC is known as a risk factor, despite the fact that, the exact mechanism is unknown. The RCC is known to be immunogenic tumour,

because it induces an immune response and it responds to immunotherapy. The immunosuppression medications render the recipient vulnerable to the tumor aggressiveness emerges in the donor organ. One of the possible explanations, is that the RCC cells escape the attaché of natural killer -T cell, by the down regulation of factor, such as HLA molecule [22].

One of the major risk factors of RCC development in the native kidney of the post-transplant recipient is ACKD [10].The diagnosis of ACKD is by U/S, CT or MRI, the criteria of diagnosis ,is bilateral renal multiple cysts (at least three cysts in each kidney) [5,23].Over 7-10 years the risk of RCC in ACKD is about 4-7%,with yearly incidence of 0.18 % [24-26].The pathogenesis that link the RCC development in ACKD patients, is thought to be ,that the loss of nephron induce the process of tubular hyperplasia and cyst formation, under the influence of epidermal growth factor ,hepatocyte growth factor, Bcl-2 and activation of proto-oncogene such as Jun [12,13].The RCC histopathology types in the sporadic cases is about 19% (papillary) Vs 54% in the ACKD group in addition to that ,there is high incidence of multifocal as well as bilateral tumour in the ACKD group [20,27,28].Some studies has reported a percentage of high grade tumour as high as 50% in ACKD patients [20,21].

Although radical nephrectomy is recommended by many experts in the field as the main treatment, this is not supported by the enough number of evidence-based studies [20]. The outcome of papillary RCC is good as reported in many studies, Lanhez et al, all the cases underwent radical nephrectomy survived only one patient died in Moudouni and Neuzillet [20,21,27,29]. However, this is not the case in the metastatic disease, in which the prognosis is poor. The treatment of metastatic disease includes surgical removal, as well as anti-tumour systemic treatment, in addition to that, the immunosuppression regimen should be modified in all patients (reducing the dose) [21]. The option of immunotherapy is also available, but in general the use of immunotherapy is contraindicated in patient receiving immunosuppressive agents. In spite of that agents such as temsirolimus, sunitinib and sorafenib could be used safely [20,21,30].

Because of the strong association between ACKD and RCC, strict follow up regimen has been advised, which usually in the form of abdominal U/S or CT scan, according to Bosniak"s classification, patients could be categorized into :1- all patients post-transplant should undergo annual U/S regardless of ACKD detection [11,31]. 2- Bosniak 1 or 2 cysts, should undergo U/S screening twice/year .3- Bosniak 1 or 2F cysts, should undergo U/S screening four times /year, and CT scan or MRI annually, if there is progression radical nephrectomy is indicated .4- Bosniak 3 or 4, should proceed to radical nephrectomy.

Another histological subtype of RCC is squamous cell carcinoma, and although it is rare to be diagnosed, because of it is non-specific symptoms, it usually carries poor prognosis.SRCC usually complicate chronic recurrent stone disease and urinary tract infection, which lead to chronic irritation and squamous metaplasia. Routine annual surveillance U/S abdomen usually fail to detect the condition, unlike CT scan which is able to identify the lesion. So, Uk renal association doesn't recommend screening U/S for surveillance of SRCC, however they do advice minimizing immunosuppression reduction and smoking cessation [32].

One of the useful preventive measures to be introduced in post renal transplant recipients is to change the immunosuppressant regimen. Sirolimus inhibits IL-2, which subsequently reduce the effect of rapamycin [9]. The overall outcome is induction of tumour regression and enhancement of anti-tumour immune response [33]. Rapamycin has been proved to reduce the incidence of malignancies in post renal transplant patients, especially squamous cell carcinoma [34].

To sum up, RCC in renal transplant patient tends to has favourable parameters, such as stage and grade, in the same time they are most likely bilateral, papillary and multifocal. Metastatic RCC should be treated by surgery with metastatectomy. Finally, a yearly screening programme using U/S is recommended for every case.

References

1. Alberu J (2010) Clinical insights for cancer outcomes in renal transplant patients. Transplant Proc 42: S36-S40.
2. Andres A (2005) Cancer incidence after immunosuppressive treatment following kidney transplantation. Crit Rev Oncol Hematol 56: 71-85.
3. Briggs JD (2001) Causes of death after renal transplantation. Nephrol Dial Transplant 16: 1545-1549.
4. Penn I (1999) Posttransplant malignancies. Transplant Proc 31: 1260-1262.
5. JD Doublet, MN Peraldi, B Gattegno, P Thibault, JD Sraer (1997) Renal cell carcinoma of native kidneys: prospective study of 129 renal transplant patients. J Urol 158: 42-44.
6. Pope JC, MO Koch, RE Bluth (1994) Renal cell carcinoma in patients withend-stage renal disease: A comparison of clinical significance in patients receiving hemodialysis and those with renal transplants. Urology 44: 497-501.
7. Scott M and R Sells (1988) Primary adenocarcinoma in a transplanted cadaveric kidney. Transplantation 46: 157-158.
8. KI Park, H Inoue, CJ Kim, T Tomoyoshi (1997) Nephron sparing surgery for de novo renal cell carcinoma in an allograft kidney: a case report. Int J Urol 4: 611-614.
9. Stewart JH, Buccianti G, Agodoa L, Gellert R, McCredie MR, et al. (2003) Cancers of the kidney and urinary tract in patients on dialysis for end-stage renal disease: analysis of data from the United States, Europe, and Australia and New Zealand. J Am Soc Nephrol 14: 197-207.
10. Anke Schwarz, Serap Vatandaslar, Saskia Merkel, Hermann Haller (2007) Renal cell carcinoma in transplant recipients with acquired cystic kidney disease. Clin J Am Soc Nephrol 2: 750-756.
11. Konda R, Sato H, Hatafuku F, Nozawa T, Ioritani N, et al. (2004) Expression of hepatocyte growth factor and its receptor C-met in acquired renal cystic disease associated with renal cell carcinoma. J Urol 171: 2166-2170.
12. Oya M, Mikami S, Mizuno R, Marumo K, Mukai M, et al. (2005) C-jun activation in acquired cystic kidney disease and renal cell carcinoma. J Urol 174: 726-730.
13. Hughson MD, Schmidt L, Zbar B, Daugherty S, Meloni AM, et al. (1996) Renal cell carcinoma of end-stage renal disease: a histopathologic and molecular genetic study. J Am Soc Nephrol 7: 2461-2468.
14. Inoue H, Nonomura N, Kojima Y, Shiba M, Oka D, et al. (2007) Somatic mutations of the von Hippel–Lindau disease gene in renal carcinomas occurring in patients with long-term dialysis. Nephrol Dial Transplant 22: 2052-2055.
15. Misumi T, Ide K, Onoe T, Banshodani M, Tazawa H, et al. (2012) Incidental renal cell carcinoma presenting in a renal transplant recipient with autosomal dominant polycystic kidney disease: a case report. J Med Case Rep 6: 1-5.
16. Bing Z, JE Tomaszewski (2011) Clear cell papillary renal cell carcinoma in the bilateral native kidneys after 2 years of renal transplantation: report of a case and review of the

literature. Case Rep Transplant 2011: 387645

17. Lum EL, Huang E, Bunnapradist S, Pham T, Danovitch G (2017) Acute kidney allograft rejection precipitated by lenalidomide treatment for multiple myeloma. Am J Kidney Dis 69: 701-704.
18. Tsaur I, Obermüller N, Jonas D, Blaheta R, Juengel E, et al. (2011) De novo renal cell carcinoma of native and graft kidneys in renal transplant recipients. BJU Int 108: 229-234.
19. Moudouni SM, Tligui M, Rafii A, Tchala K, Haab F, et al. (2006) Renal cell carcinoma of native kidney in renal transplant recipients. BJU Int 98: 298-302.
20. Neuzillet Y, Lay F, Luccioni A, Daniel L, Berland Y, et al. (2005) De novo renal cell carcinoma of native kidney in renal transplant recipients. Cancer 103: 251-257.
21. Y Tomita, T Nishiyama, M Fujiwara, S Sato (1990) Immunohistochemical detection of major histocompatibility complex antigens and quantitative analysis of tumour-infiltrating mononuclear cells in renal cell cancer. Br J Cancer 62: 354-359.
22. Ferda J, Hora M, Hes O, Reischig T, Kreuzberg B, et al. (2007) Computed tomography of renal cell carcinoma in patients with terminal renal impairment. Eur J Radiol 63: 295-301.
23. Ishikawa I, Saito Y, Shikura N, Kitada H, Shinoda A, et al. (1990) Ten-year prospective study on the development of renal cell carcinoma in dialysis patients. Am J Kidney Dis 16: 452-458.
24. E Levine, SL Slusher, JJ Grantham, LH Wetzel (1991) Natural history of acquired renal cystic disease in dialysis patients: a prospective longitudinal CT study. AJR Am J Roentgenol 156: 501-506.
25. LD Truong, B Krishnan, JT Cao, R Barrios, WN Suki, et al. (1995) Renal neoplasm in acquired cystic kidney disease. Am J Kidney Dis 26: 1-12.
26. Ianhez LE, Lucon M, Nahas WC, Sabbaga E, Saldanha LB, et al. (2007) Renal cell carcinoma in renal transplant patients. Urology 69: 462-464.
27. Leveridge M, Musquera M, Evans A, Cardella C, Pei Y, et al. (2011) Renal cell carcinoma in the native and allograft kidneys of renal transplant recipients. J Urol 186: 219-223.
28. Klatte T, Seitz C, Waldert M, de Martino M, Kikic Z, et al. (2010) Features and outcomes of renal cell carcinoma of native kidneys in renal transplant recipients. BJU international 105: 1260-1265.
29. Hudes G, Carducci M, Tomczak P, Dutcher J, Figlin R, et al. (2007) Temsirolimus, interferon alfa, or both for advanced renal-cell carcinoma. N Engl J Med 356: 2271-2281.
30. Scandling JD (2007) Acquired cystic kidney disease and renal cell cancer after transplantation: time to rethink screening? Clin J Am Soc Nephrol 2: 621-622.
31. Baker R, A Jardine, P Andrews (2011) Renal Association Clinical Practice Guideline on post-operative care of the kidney transplant recipient. Nephron 118: c311.
32. M Boratyńska, E Watorek, D Smolska, D Patrzałek, M Klinger (2007) Anticancer effect of sirolimus in renal allograft recipients with de novo malignancies. Transplant Proc 39: 2736-2739.
33. Alberú J, Pascoe MD, Campistol JM, Schena FP, Rial Mdel C, et al. (2011) Lower malignancy rates in renal allograft recipients converted to sirolimus-based, calcineurin inhibitor-free immunotherapy: 24-month results from the CONVERT trial. Transplantation 92: 303-310.
34. Campistol JM, Eris J, Oberbauer R, Friend P, Hutchison B, et al. (2006) Sirolimus therapy after early cyclosporine withdrawal reduces the risk for cancer in adult renal transplantation. J Am Soc Nephrol 17: 581-589.

Copyright: ©2026 Haytham Araibi. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.