Percutaneous cryoablation of a renal cell carcinoma in a transplanted kidney

Tommaso Silvestri, MD,[1] Fulvio Stacul, MD,[2] Michele Bertolotto, MD,[3] Mary Artero, MD,[4] Salvatore Siracusano, MD[1]

[1]Department of Urology, University of Trieste, Trieste, Italy
[2]Department of Radiology, AOU - Trieste Hospital, Trieste, Italy
[3]Department of Radiology, University of Trieste, Trieste, Italy
[4]Division of Nephrology and Dialysis, AOU – Trieste Hospital, Trieste, Italy

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In patients who undergo renal transplantation urinary tract tumors have an incidence of approximately 1.5%-3.3%. We report a rare case of renal cell carcinoma occurring in a transplanted kidney 25 years after the transplant. The lesion was treated by CT-guided percutaneous cryoablation with the ablation of renal lesion. This approach offers more accuracy compared with ultrasonography (US), and it is faster compared to magnetic resonance (MR) guidance. In transplanted kidneys CT-guided cryoablation seems to be safe.

Key Words: renal cell carcinoma, renal transplant, percutaneous cryoablation

Patients with a kidney transplant have a higher incidence for malignancies compared to the general population, due to the necessary immune suppression to prevent graft rejection.[1]

The interval between transplantation and the point at which tumor becomes evident can be as long as 36 to 42 months or later.[2] Common malignancies, which exceed the incidence in these population, include skin cancer, renal cell carcinoma of the native kidney, hepatocellular carcinoma, colon and anal cancer, vaginal and cervical cancer and post-transplantation lymphoproliferative disease. De novo primary renal cell carcinoma (RCC) usually involves the native kidney, while RCC in a renal allograft is less common but has been reported with an average interval of 3 to 4 years after transplant.[3]

We report a case of a patient with a solitary RCC in a renal allograft 25 years after transplantation which was treated with computed tomography (CT) -guided percutaneous cryoablation (PCA), and we review the literature in this setting.

Case report

A 58-year-old caucasian female underwent a deceased-donor renal transplant for end-stage renal disease (ESRD) in 1987. The native kidneys showed no marks of malignancy. The patient was doing well with baseline creatinine between 1.4 mg/dL and 1.6 mg/dL.

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Address correspondence to Professor Salvatore Siracusano, Department of Urology, University of Trieste, Cattinara Hospital – Via Strada di Fiume 447, 34100 Trieste – Italy

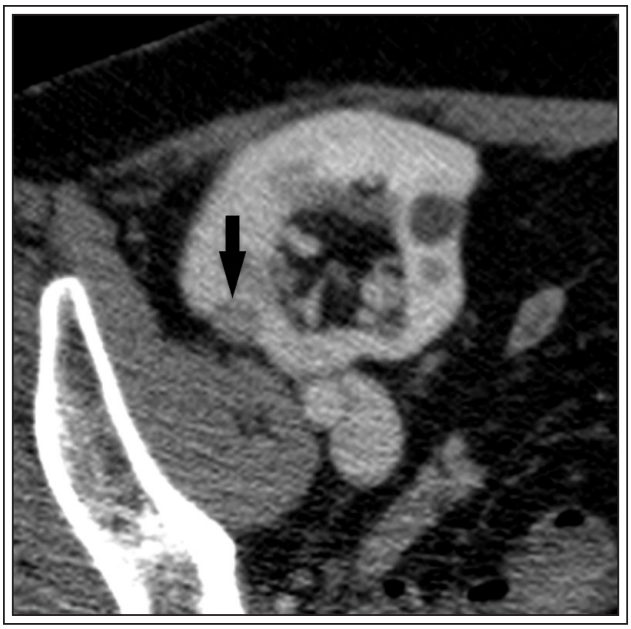

Figure 1. Contrast enhanced CT: hypodense lesion (arrow) consistent with neoplasm in the renal allograft.

After 25 years a 9 mm lesion in the kidney allograft was found during the routine ultrasonography follow up. Additional evaluation with contrast-enhanced ultrasound (CEUS) confirmed a solid 1 cm x 1.3 cm hypoechoic lesion in the lower pole of the kidney graft. Computerized tomography, Figure 1, showed the enhancement nature of the lesion.

Figure 2. Contrast enhanced CT: at the end of percutaneous cryoablation the ice-ball (arrow) can be detected, extending well beyond the borders of the lesion.

Percutaneous cryoablation was performed due to the favorable location and small size of the lesion. In our hospital we use a SeedNet Gold System (Galil Medical) machine. A uroradiologist performed the local anesthesia in the right iliac fossa and a CT-guided percutaneous renal biopsy was carried out. A 17G IceSphere type needle was used to create a freeze "front" extending 10 mm beyond the border of the lesion. Two 10 minute freeze cycles with an intervening 10 minute thaw cycle (9 minutes of passive thawing and 1 minute of active thawing) were done. The growing ice-ball was monitored during the entire cycle under CT visualization, Figure 2. It was not necessary to stop the immunosuppressive therapy before the procedure. The patient had an uncomplicated postoperative course, and the creatinine level remained stable. The patient was discharged on the first postoperative day.

At follow up after 48 hours the cryoablated lesion measured 2.0 cm with no enhancement on CEUS. This was compatible with success of the percutaneous cryoablation. The final histopathology findings of the needle biopsy were consistent with a papillary renal cell carcinoma (PRCC) type 1. At the 12 month follow up the cryoablated lesion measured 5 mm without CT enhancement when IV contrast was given.

Discussion

In kidney transplant recipients with a functioning graft cancer accounts for 7% of all deaths, and the risk is 3 to 5 times higher compared to the general population. In patients who undergo renal transplantation urinary tract tumors represent around 15% of the tumors diagnosed with an incidence approximately of 1.5%-3.3%.[4] The late development of a primary tumor in the kidney allograft is in any case a rare event.[5] PRCC is a rare malignant tumour entity compared to common clear cell carcinoma.[6]

The usual treatment of renal allograft requires either an allograft nephrectomy or a partial nephrectomy in relation to the size of the tumour.[5,7] Recent developments have led to the use of minimally invasive therapies such as percutaneous cryoablation or radiofrequency ablation.[7]

In a review of the literature we have found only five case reports of kidney allograft tumors occurring within 10 years from transplantation and treated by cryotherapy.[8-10] The patient described in our case report represents the longest interval from transplantation to tumor appearance yet reported.

In particular three patients underwent the procedure with CT guidance, one underwent the procedure with US guidance, while the remaining patient underwent

the procedure with guidance with both modalities. In our case we performed a CT-guided PCA because this type of treatment offers more accuracy compared with US for the puncture of the lesion that needs to be frozen and it is faster compared to MR guidance. In any case this treatment avoids the surgical approach that in these patients is useful to maintain a good quality of life.

CT-guided cryoablation of tumors in the transplanted kidney seems to be safe. Continued long term follow up and greater clinical experience will be necessary to assure adequate treatment and to confirm the efficacy of cryoablation for all allograft lesions. □

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