Actas Urol Esp. 2013;37(4):242–248

Actas Urológicas Españolas

www.elsevier.es/actasuro

REVIEW ARTICLE

# Conservative treatment of renal cell carcinoma in kidney transplantation☆

R. González-López[a,*], G. Bueno-Serrano[a], J.J. Vázquez-Escuderos[a], J. Mayor-De Castro[b], C. González-Enguita[a]

[a] *Servicio de Urología, Instituto de Investigaciones Sanitarias-Fundación Jiménez Díaz, Universidad Autónoma de Madrid, Madrid, Spain*
[b] *Servicio de Urología, Hospital General Universitario Gregorio Marañón, Universidad Complutense de Madrid, Madrid, Spain*

Received 25 February 2012; accepted 28 July 2012
Available online 30 July 2013

**KEYWORDS**
Kidney transplantation;
Partial nephrectomy;
Renal cell carcinoma;
Cryosurgery;
Radiofrequency ablation

## Abstract
*Purpose:* To evaluate the new treatment strategies in renal cell carcinoma (RCC) that affects the graft in renal recipients.
*Methods:* A literature review is made, analyzing all the published cases of conservative surgery in renal graft RCC.
*Synthesis of evidence:* A total of 51 partial nephrectomies in renal graft patients have been described, with a graft survival rate of 88% and a recurrence rate of 6%. Most of the patients (75%) were asymptomatic at the time of diagnosis, and the mean lesion size was 2.8 cm. Enucleation was the most frequent technique employed. 77% of all immunosuppressor regimens included cyclosporine A. Six patients with graft RCC were subjected to radiofrequency ablation and two patients underwent percutaneous cryoablation, with a single case of relapse and a graft survival rate of 100%.
*Conclusions:* Nephron-sparing surgery is a good management option in renal graft RCC, affording good oncological control and graft survival. Modification of immunosuppression with the withdrawal of cyclosporine A and the introduction of mTOR inhibitors is an adequate measure in such patients.


**PALABRAS CLAVE**
Trasplante renal;
Nefrectomía parcial;

## Tratamiento conservador del carcinoma de células renales en el injerto renal

## Resumen
*Contexto:* Se pretende evaluar el conocimiento actual acerca del tratamiento del carcinoma de células renales (CCR) que afecta al injerto en los pacientes trasplantados de riñón.

☆ Please cite this article as: González-López R, et al. Tratamiento conservador del carcinoma de células renales en el injerto renal. Actas Urol Esp. 2013;37:242–8.

* Corresponding author.
*E-mail address:* rgonzalezl@fjd.es (R. González-López).

2173-5786/$ – see front matter 

Carcinoma de células renales;
Criocirugía;
Ablación por radiofrecuencia

*Adquisición de evidencia:* Revisión de la literatura actual basada en el análisis de los casos publicados de cirugía conservadora de nefronas en el carcinoma de células renales que afecta al injerto renal.
*Síntesis de evidencia:* Se han descrito 51 casos de nefrectomía parcial en injerto renal, con una supervivencia del injerto del 88% y un índice de recurrencia del 6%. La mayoría de los pacientes estaban asintomáticos al diagnóstico (75%) y el tamaño medio de las lesiones fue de 2.8 cm. La técnica más utilizada fue la enucleación. El 77% de las pautas inmunosupresoras incluían ciclosporina A. Seis pacientes fueron tratados mediante radiofrecuencia y dos recibieron crioablación percutánea, con una supervivencia del 100% de los injertos y un único caso de recidiva, que requirió segundo tratamiento.
*Conclusiones:* La cirugía conservadora del parénquima renal es una opción terapeútica empleada ante CCR sobre injerto renal que consigue buen control oncológico y buena supervivencia del injerto. La modificación de la inmunosupresión con la supresión de ciclosporina A y la introducción de inhibidores de mTOR podría ser una medida adecuada en estos pacientes y merece futuras investigaciones.


## Context

Renal cell carcinoma (RCC) is the most common solid malignancy in transplant recipients, after skin tumors and carcinoma of the cervix. With a higher incidence in these patients than in the general population (4.6% vs. 3.2%), it usually affects the native kidneys, occurring in less than 10% of the cases in the graft. The treatment of choice is the native kidney nephrectomy, although in recent years different types of nephron sparing surgery or alternative treatments for tumors affecting the graft have been described. Introducing mTOR inhibitors in the immunosuppressive regimens of these patients is an increasingly common measure after surgical treatment. We analyzed the role of the new therapeutic modalities in RCC affecting the graft.

## Evidence acquisition

We conducted a literature search in the PubMed database. We analyzed all those articles in which treatment of the RCC of the graft was performed by means of a nephron sparing technique. We studied the data on the reported cases, dividing the results into 3 groups: partial nephrectomy, radiofrequency ablation (RFA), and percutaneous cryoablation. We performed a descriptive analysis thereof.

## Evidence synthesis

RCC treatment which affects the graft has typically consisted of the transplant nephrectomy, which conditions a significant reduction in the quality of life of the patients due to the need for dialysis after surgery. In recent years, advances in nephron sparing surgery and minimally invasive techniques have facilitated its application in the tumor disease of the graft. So far there are 51 cases described in the international literature of partial graft surgery, 6 cases of RFA, and 2 cases of percutaneous cryoablation.

### Partial nephrectomy

After performing the first operation in 1992 by Feldman and Jacobs,[1] 51 cases of nephron sparing surgery have been described on the renal graft (Table 1).[1–32] In most cases, removal of the mass was carried out (66%).

The pathological result was RCC in 86.3% of the cases, oncocytoma in 4%, angiomyolipoma in 6%, and in 3.7% it was not specified. Of the malignant lesions, the most frequent subtype was clear cell carcinoma (41%), followed by the papillary (29%) and collecting duct (7%) origin. In the remaining 23%, the origin was not specified. The diagnosis was made an average of 10 years after the implantation. In most cases (75%), the tumors were detected incidentally during the routine ultrasound scan of the graft. The remaining patients had different symptoms (elevated baseline creatinine, microscopic hematuria, pain), which gave rise to imaging tests that led to the diagnosis. In 2 patients (4%), the lesion was detected during the transplantation. In one of them,[23] removal of a middle-sized cyst was carried out in bench surgery during the making of a living donor transplant, detecting RCC in its wall and performing polar nephrectomy 2 weeks after the first surgery. In the other one,[7] a 1-cm solid mass was detected during bench surgery, we proceeded to its excision, and after patient consent, the graft was implanted.

The average lesion size was 2.8 cm, with a variability between 0.7 and 9 cm. In 3 patients, 2 synchronous tumors were detected in the graft[1,4,28] that were removed during the same surgical procedure. In 16.3% of the cases,[9,12,14,15,21,23] ultrasound was used intraoperatively to confirm the location of the lesion and delimit its margins; in the rest (83.7%), we did without it, since in most cases they were exophytic and macroscopically well-delimited lesions. In 3 patients we used the harmonic scalpel during surgery, being highlighted by the authors for its contribution in reducing the bleeding of the bed and the best definition of the surgical plane.[21,26]

In the follow-up of the patients, we used various imaging techniques. In 23.5% we carried it out by means of