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SURGICAL TECHNIQUE

Retroperitoneal and transperitoneal laparoscopic cryotherapy for small renal masses☆

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Abstract

Objective: Cryotherapy is a minimally invasive ablative technique that is considered an alternative to conventional surgery for preserving renal function in small renal tumors and in selected cases. We present our results from laparoscopic renal cryotherapy.

Material and method: We retrospectively analyzed 17 renal tumors diagnosed in 16 patients treated with cryotherapy. The patients' mean age was 66 years (43–80). The mean tumor size was 1.8 cm (0.7–3.7 cm). Cryotherapy with double-freeze cycle was performed laparoscopically in all cases (10 by transperitoneal approach and 7 by retroperitoneal approach).

Results: Perioperative biopsies were performed on all patients and were positive for malignancy in 10 cases (59%). The mean stay was 2.8 days. The mean operative time was 162 min. Only 1 case reverted to open surgery due to bleeding. One patient required a blood transfusion in the immediate postoperative period. The majority of complications were Clavien-Dindo grades I and II. Some 76.5% of the patients had no complications. After a mean follow-up of 31 months (6–102), 1 patient died from nontumor-related causes, and 12 patients (75%) still show no evidence of local recurrence or progression. One patient had tumor persistence and therefore underwent partial nephrectomy at 6 months. One patient had a metachronous recurrence in the same kidney at 36 months, and another patient had a recurrence at 23 months.

Conclusions: Laparoscopic renal cryotherapy is a safe and feasible technique and is a good alternative to surgery for selected renal tumors.

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PALABRAS CLAVE
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Crioterapia renal laparoscópica por vía retroperitoneal y transperitoneal en masas renales de pequeño tamaño

Resumen

Objetivo: La crioterapia es una técnica ablativa, mínimamente invasiva, que se plantea como una alternativa a la cirugía convencional para preservar la función renal en tumores renales pequeños y en casos seleccionados. Evaluamos nuestros resultados de crioterapia renal laparoscópica.

Material y método: Se analizan de forma retrospectiva 17 tumores renales tratados con crioterapia diagnosticados en 16 pacientes, con una media de edad de 66 años (43-80). El tamaño medio tumoral fue de 1,8 cm (0,7-3,7 cm). La crioterapia con doble ciclo de congelación se realizó por vía laparoscópica en todos los casos (10 por abordaje transperitoneal y 7 retroperitoneal).

Resultados: Se realizaron biopsias perioperatorias en todos los pacientes, siendo positiva para malignidad en 10 casos (59%). La estancia media fue de 2,8 días. La media de tiempo operatorio fue de 162 min. Solo un caso se reconvertió a cirugía abierta por sangrado. Un paciente requirió transfusión sanguínea en el postoperatorio inmediato. La mayoría de complicaciones fueron Clavien-Dindo I-II. El 76,5% no presentó complicaciones. Tras un seguimiento medio de 31 meses (6-102), un paciente falleció por causa no tumoral y 12 casos (75%) siguen sin evidencia de recidiva local o progresión. Un caso presentó persistencia tumoral, por lo que fue sometido a nefrectomía parcial a los 6 meses. Un paciente presentó recidiva metacrónica en el mismo riñón a los 36 meses y otro recidivó a los 23 meses.

Conclusiones: La crioterapia renal laparoscópica es una técnica segura y factible, siendo una buena alternativa a la cirugía en tumores renales seleccionados.

Introduction

In recent decades, the diagnosis of small renal masses has increased thanks to the widespread use of imaging techniques.[1] The greatest incidence of these tumors has been found in patients >70 years, who normally have higher comorbidities. It is for this reason that in the management of these patients it is important to seek a balance between cancer control, life expectancy, renal function, and individual risk of undergoing surgery.

Partial nephrectomy remains the treatment of choice for localized renal tumor (T1a) due to its optimal oncological results.[2] Active surveillance has emerged as a possible option in elderly patients and/or with significant comorbidity, with low life expectancy and not candidates for surgery.[3]

In recent years, there have been, as an alternative to nephron-sparing surgery, minimally invasive ablative techniques in order to preserve renal function and decrease operative morbidity in patients with high surgical risk. In this sense, we have laparoscopic cryotherapy, which offers good oncological results, optimal preservation of renal function, and the advantage of having a reduction in intra and perioperative complications with respect to conventional surgery.[4] We present the second largest series of laparoscopic renal cryotherapy published in our country.

Materials and methods

All patients undergoing laparoscopic renal cryotherapy were retrospectively analyzed in our center. The selection criteria were patients with kidney tumor <4 cm, of peripheral location diagnosed by abdominal computed tomography (CT) or magnetic resonance (MRI) (stage T1a). Cystic renal masses, tumors in the renal hilum, near the ureter, or with extension of the tumor in the urinary tract were discarded for the performance of this technique.[5] All patients were informed of all treatment options (radical nephrectomy and partial nephrectomy).

The follow-up was performed with the same imaging test performed for diagnosis at 3, 6 and 12 months; subsequently every six months. Postoperative complications were recorded and sorted by Clavien-Dindo classification.[6]

Surgical technique

All operations are performed under general anesthesia in lateral decubitus. The choice of the laparoscopic technique to be performed (transperineal or retroperitoneal) depends on tumor location, reserving the retroperitoneal approach for renal lesions located on the renal dorsal side.

After trocar placement, Gerota fascia is dissected leaving the kidney completely freed from the perirenal fascia, with the aim of locating and facilitating direct view of the tumor. Prior to starting the cryopreservation, biopsies of the lesion are taken with Trucut® (18 G).

Subsequently, insertion of cryoneedles of 1.47 mm (17 G) (Galil Medical SeedNet™, Tel Aviv, Israel) is performed through the tumor (Fig. 1). We used 2 types of needles: IceSeed (small cryoball of 10.5 mm × 19 mm in diameter) and IceRod (long cryoball of 16 mm × 41 mm in diameter). The choice of type and number of needles used depend on the tumor size and the diameter of the cryoball that is desired