CLINICAL CASE

Technical aspects of laparoscopic partial nephrectomy


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KEYWORDS
Renal cell carcinoma; Laparoscopic partial nephrectomy; Open partial nephrectomy; Mexico.

Abstract Renal cell carcinoma (RCC) represents 3% of all malignant tumors in the adult, with a man:woman ratio of 2:1. It is more frequent between the ages of 60 and 70 years, and 80% of the patients present with the histologic clear cell variant. Currently, 50% of patients are diagnosed incidentally.

A 71-year-old man had illness onset in March 2012 with gross hematuria, developing symptoms of acute urine retention. A transurethral catheter (TUC) was placed and the hematuria remitted. Study protocol was carried out, and the urotomography (UroCAT) scan identified a heterogeneous tumor on the lateral surface of the upper pole of the right kidney that measured 45 x 40 mm and had a radiodensity of 20 HU with up to 120 HU enhancement, plus a simple left Bosniak 1 renal cyst. A right laparoscopic partial nephrectomy (LPN) was performed using the transperitoneal abdominal approach with dissection of the renal unit. Upon locating the renal mass, the renal hilum was clamped under warm ischemia. The tumor was resected, bovine thrombin (Floseal®) was placed at the resection site, and mattress sutures were used to suture the fatty tissue patch. The histopathologic study reported the eosinophilic variant of chromophobe carcinoma, pT1b NO MO.

There has been a significant increase in nephron-sparing surgery (LPN) to date and its main usefulness has been in localized tumors. Depending on tumor location, the approaches are transperitoneal, retroperitoneal, and hand-assisted. LPN has the important benefit of being minimally invasive, maintaining the function of the rest of the renal parenchyma.

LPN is an alternative to open partial nephrectomy (OPN) when performed by an experienced surgeon and on selected patients. The ideal indication for LPN is a small, peripheral renal tumor.

Introduction

Renal cell carcinoma (RCC) represents 3% of all malignant tumors in the adult, with a man:woman ratio of 2:1. It is more frequent in the fourth and sixth decades of life and 80% of the cases are the clear cell histologic variant. Currently, 50% of the cases are diagnosed incidentally, the majority through imaging techniques such as ultrasonography and computerized tomography (CT). Partial nephrectomy has gained importance in cases of localized tumors, with the modalities of open partial nephrectomy (OPN) and laparoscopic partial nephrectomy (LPN). The latter, minimally invasive, was introduced by McDougall and Winfield in 1993, and over the years has had greater reproducibility. Indications for LPN are: absolute (a single anatomic or functioning kidney), relative (an affected contralateral kidney with deteriorating kidney function), and optional (localized unilateral kidney cancer with a healthy contralateral kidney).

Case presentation

A 71-year-old man was diagnosed with high blood pressure in 1999 and is in treatment with metoprolol. His past medical history includes TURP in 2001. His present disease onset was in March 2012 with gross hematuria, developing symptoms of acute urine retention (AUR). A transurethral catheter (TUC) was placed and the hematuria remitted. In the study protocol, a urotomography (UroCAT) scan revealed a heterogeneous renal tumor on the lateral surface of the upper pole of the right kidney that measured 45 x 40 mm, 20 UH, that refuerza hasta 120 UH, sumado a un quiste renal simple izquierdo Bosniak I. Se realiza nefrectomía parcial laparoscópica (NPL) derecha. Técnicamente: abordaje abdominoperitoneal con disección de la unidad renal, al realizar la masa renal se realiza isquemia caliente en hilio renal, se reseca tumor, se coloca trombina bovina (Floseal®) en lecho de resección y parche de tejido graso, se dan puntos de colchonero. Reporte histopatológico: carcinoma cromófobo variante de células eosinófilas, pT1bN0M0.

Discussion

There has been an important increase to date in nerve-sparing LPN surgery and its principal use is in localized T1a or T1b tumors. The transperitoneal, retroperitoneal, and hand-assisted approaches are among its technical aspects. A transperitoneal approach is simpler in anterior tumors that are located in the lower pole, than in those on the posterior or superior surface, which are ideal candidates for a retroperitoneal approach. However, total kidney dissection can make complete renal exposure possible in a transperitoneal approach. Hand-assisted surgery can be useful in concrete cases of large-volume tumors, enabling better control of hemorrhage with manual compression, thus prolonging the work time and therefore minimizing the warm ischemia period in cases of difficult access or large tumor volume. It is important to see the location of the tumor. In the case of the transperitoneal approach the patient is positioned at a 30° angle and 4 to 5 trocars are placed. The kidney is dissected, mannitol is administered, proceeding to warm ischemia (a time not over 30 to 40 min is essential) and to the partial nephrectomy with a monopolar device. A
cold-knife incision is made at the level of the renal medulla, bovine thrombin (Floseal®) is placed at the surgical site with Monocryl™ 3-0 mattress sutures, interposed with gel-foam. A drain is placed and the trocar area is closed.2,5

LPN is a complex technique, even for the experienced surgeon, and it has a high complication rate that includes intra and postoperative bleeding and urinary fistulas. Positive surgical margins are the most important complications.8,9

Although it is true that surgery duration is longer with LNP than with OPN and the postoperative complication rate is greater (kidney failure, urinary fistulas, blood loss) these factors will decrease in relation to the learning curve. The importance of this surgery is the benefit of minimal invasion, maintaining the function of the rest of the renal parenchyma.1,2,5

Conclusions

In the hands of experienced surgeons and with selected patients, LPN is an alternative to OPN. The ideal indication for LPN is a small and peripheral tumor. Long-term kidney function is dependent on the length of time of the intraoperative ischemia. LPN has a higher complication rate than open surgery, but it is now known that the result in the oncologic follow-up is similar to that obtained with OPN.

Conflict of interest

The authors declare that there is no conflict of interest.

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References


