LAPAROSCOPIC RESECTION OF ISOLATED FOSSA RECURRENTCE OF RENAL CELL CARCINOMA AFTER OPEN NEPHRECTOMY: REPORT OF 6 CASES AND LITERATURE REVIEW

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Summary.- OBJECTIVES: Local recurrence after a correct surgical technique and absence of distant metastasis is a rare occurrence after radical nephrectomy. Surgical resection remains the standard management for this pathological setting. Nevertheless controversy persists over surgical approach and adjuvant treatments.

METHODS: We report on perioperative outcomes of a small multi-institutional series of patients with fully laparoscopic management of isolated renal fossa recurrence following open radical nephrectomy.

RESULTS: All patients underwent full laparoscopic surgery. Mean operative time was 140 minutes (range 75 to 240 minutes). Only one patient had a Clavien Grade IIIa complication. Mean hospital stay was 3 days (range 2 to 4 days). Out of the six patients, 5 had a mean follow-up of 20 months (range 9 to 32 months). Only one of these patients evolved with distant metastasis after surgery.

CONCLUSIONS: Laparoscopic resection of local recurrence after open radical nephrectomy is a challenging but reproducible technique. There is still no consensus or an operative protocol for this clinical setting. However, as long as surgery is kept within the possibilities, a laparoscopic approach should be sought.

Keywords: Renal tumor. Local recurrence. Laparoscopy.

Resumen.- OBJETIVO: La recurrencia local frente a una correcta técnica quirúrgica y ante la ausencia de metástasis a distancia es de rara presentación luego de la nefrectomía radical. El tratamiento estándar para esta presentación clínica sigue siendo la resección quirúrgica.

MÉTODOS: En este trabajo, reportamos una pequeña serie de pacientes con manejo completo laparoscópico de recurrencia de carcinoma renal luego de nefrectomía radical convencional.

RESULTADOS: En todos los pacientes se realizó un abordaje laparoscópico con excelentes resultados. El tiempo operatorio promedio fue de 140 minutos (rango 75 a
INTRODUCTION

The National Cancer Institute reported an estimated 49,096 new renal cancers in 2009. The widespread use of high end imaging technology has allowed for incidental diagnosis of clear cell renal carcinoma (CCRC) at an early stage. However, CCRC mortality has remained unchanged for the past 15 years.

Surgical removal of the renal lesion continues to be the gold standard for this malignancy. Both open or laparoscopic, radical and partial nephrectomies have been well standardized and high quality criteria are met in many centers worldwide.

Local recurrence in the face of correct surgical technique and absence of distant metastasis is a rare occurrence. Literature is scarce and different management strategies have been proposed for this pathological setting; however, surgical removal is recognized as the cornerstone in all treatments reported in this scenario (1-10).

Open resection, external beam radiotherapy, thermo ablation, radiofrequency ablation and hand assisted laparoscopic resection have been reported (1-10).

Herein we report a small series of patients with fully laparoscopic management of isolated renal fossa recurrence following open radical nephrectomy. The data was collected from three different institutions in South America.

PATIENTS AND METHODS

A total of 6 patients underwent laparoscopic management of isolated renal fossa recurrence after open radical nephrectomy at three institutions.

CASES

Case 1

A 76-year-old female underwent left open radical nephrectomy at our institution for a 4.5 cm Fuhrman grade I CCRC (T1b). Oncological criteria were met during surgery and the patient evolved uneventfully. Six months after initial surgery a 3.2 cm mass was seen in the left renal fossa during a routine CT scan (Figure 1). Whole body bone scan along with chest CT scan ruled out any metastatic disease. Laparoscopic removal was sought.

Under general anesthesia the patient was placed in lateral decubitus after orogastric and Foley catheter had been placed. Trocar setting was similar to the one used for left laparoscopic nephrectomy. After some peritoneal adhesions had been freed, the left colon was completely mobilized.
The mass was found adjacent to the posterior muscular plane. Taking wide safety margins the lesion was completely excised using the harmonic scalpel (Ethicon Endosurgery). No further dissection was necessary.

Surgical specimen was placed in a laparoscopic retrieval bag (Ethicon Endosurgery) and extracted through prolonged incision of the distal 12 mm port. Operative field was bloodless and no suction drain was left behind.

Operative time was 90 minutes and blood loss was insignificant. The patient evolved uneventfully and was discharged on postoperative day 2. Final pathological analysis informed a 3.5 cm Fuhrman I CCRC with negative margins (Figure 2). After a 9 month follow up with CT imaging no evidence of tumor recurrence has been observed.

**Case 2**

A 59-year-old man had a history of open radical nephrectomy at another institution for a 6 cm left renal mass, which was informed as a Bellini duct carcinoma (T1b). Twenty months later the patient was seen with important weight loss. On a CT scan a 5 cm retroperitoneal mass was found under the tail of the pancreas. Further workup confirmed the absence of metastatic disease. Mass size and location was responsible for patient’s anorexia. Using the same port placement as a left radical laparoscopic nephrectomy mass removal was sought. After complete mobilization of the spleen, colon and pancreas, the mass was found within a pseudo-capsule providing an oncologically safe dissection. The pseudo-capsule facilitated ventral dissection of the aortic wall. Surgical specimen was extracted in a bag through one of the trocar incisions. Operative time and bleeding were 120 minutes and 200 ml respectively. The patient was discharged on postoperative day 2. Final pathological exam yielded clear cell renal carcinoma, ruling out the previous diagnose. Original pathology slides were never recovered. The patient remains without evidence of recurrence on CT scans after 18 months.

**Case 3**

An 81 year old male patient underwent open radical nephrectomy for a T3b right CCRC with infradiaphragmatic caval thrombus. Ten months later a 3 cm local recurrence was seen on the right renal fossa just under the liver. Retrieval of the mass was sought laparoscopically. Keeping the same oncological principles previously described, the lesion was removed uneventfully. Surgical time was 75 minutes; surgical bleeding 50 ml and the patient was discharged on postoperative day 2. After 24 months the patient remains disease free.

**Case 4**

A 66 year old female patient underwent open radical nephrectomy for a 7 cm right renal mass. Tumor was diagnosed as a Furman score 2. After 48 months a 2 cm mass was diagnosed on the renal fossa. Laparoscopic resection was achieved in 135 minutes with minimally bleeding. The patient was discharged on postoperative day 4. Final pathological exam showed a clear cell renal carcinoma. The patient remains without evidence of recurrence after 32 months.

**Case 5**

A 45 year old male with a history of a radical nephrectomy for an 8 cm left renal mass, CCRC Furman 3 with renal vein involvement. After 6 months he underwent open resection of an adrenal recurrence. Another 6 months later he was first seen at our institution with a 4 cm latero-aortic mass. The patient underwent a laparoscopic transmesocolic approach with resection of a 3.5 cm mass that later proved to be CCRC with negative margins. Surgery took 240 minutes and the patient was discharged on postoperative day 3. After 18 months of follow-up PET scan prompted resection of two isolated lesions in lung and breast, both CCRC metastases.

**Case 6**

A 63 year old male patient underwent a futile intent of open partial nephrectomy. During this surgery renal preservation was attempted for a 7 cm renal lesion. Positive surgical margins and excessive bleeding prompted to convert to radical nephrectomy. Final pathological analysis showed a pT3a Furman 2 CCRC. After 3 years the patient was seen at our institution with a 9 cm mass on the renal fossa and solitary lung metastasis (Figure 3).
After counseling the patient, laparoscopic resection of the mass was undertaken. Using a classic left adrenalectomy approach three subcostal trocars were placed. Operative time was 180 minutes and bleeding was minimum. However, the mass had to be freed from the spleen and diaphragm, while doing this a 2 cm tear was made in the left hemidiaphragm (Figure 4). Repair was made with a running 2-0 vycril suture. The patient evolved uneventfully and was discharged home on postoperative day 2. No chest tube was necessary and radiographic control was normal. After 8 days he was readmitted for fever and an 11 cm collection was diagnosed on a routine CT scan. A percutaneous drain was placed under local anesthesia and the patient was started on intravenous antibiotics. After completely draining out, the drain was removed. The patient is currently asymptomatic and awaiting resection of the pulmonary lesion.

It is worth mention that lymphadenectomy was performed in neither one of the 6 radical nephrectomies and only one of the patients required adjuvant chemotherapy. All cases are summarized on Table I.

**RESULTS**

All but one of the patients presented initial CCRC, the later had a Bellini duct carcinoma. Initial stage and grade was T1b, T3a and T3b in 3, 1 and 2 cases respectively. Mean primary tumor size was 7 cm (range 4.5 to 8 cm). Mean time to local recurrence was 18 months (range 6 to 48 months). Mean size of the lesions was 4.2 cm (range 2 to 9 cm). All patients underwent full laparoscopic surgery. Mean operative time was 140 minutes (range 75 to 240 minutes). Only one patient had a Grade IIIa complication of the Clavien classification of surgical complications. Mean hospital stay was 3 days (range 2 to 4 days). Out of the six patients, 5 had a mean follow-up of 20 months (range 9 to 32 months). Only one of these patients evolved with distant metastasis after surgery.

**DISCUSSION**

Current incidence of local recurrence after radical nephrectomy remains unknown. While this scenario may have been more common a couple of decades ago, current use of imangenology has prompted diagnosis at an early stage which in turn has lowered the incidence of local recurrence (1).

The presence of local recurrence after radical nephrectomy has been commonly associated with a poor prognosis. deKernion et al found that 86% of patients with local recurrence and distant metastasis died within 1 year, while only half (40%) of patients with local recurrence died in the absence of metastatic disease (2).

The length of time from radical nephrectomy to local recurrence indicates that patients with late local recurrences tend to have better survival (3). Sandhu et al reported their experience with 16 patients operated for local recurrence of RCC. Before surgery 8 patients had been given systemic immunotherapy with no response to their local
recurrence and two patients were deemed inoperable. Of the remaining 14, 8 (57%) had tumor-free margins on histological examination. At a median follow-up of 1 year, five patients remain disease free, four have local and distant relapse, and five developed distant metastasis only. The authors concluded that the presence of tumor at the resection margin is a significant factor in predicting local and distant disease-free survival and complete surgical extirpation can lead to prolonged disease-free survival (4).

The presence of local recurrence is usually asymptomatic; nevertheless symptoms may appear if surrounding organs are affected by tumor growth. Isolated fossa recurrence in the absence of metastatic disease is commonly associated with poor surgical technique and presence of positive surgical margins. However, tumor grade and stage are also related to this occurrence. In the first case above mentioned, primary radical nephrectomy was performed without incident and initial tumor stage and grade were T1b and Fuhrman I respectively. In the second case a misdiagnosed CCRC was informed as a Bellini duct carcinoma and the patient skipped follow-up only to be seen after having lost significant weight. For the third, fifth and sixth case, tumor stage and grade (T3b, Fuhrman 3, T3a) were clearly associated with local recurrence. On the other hand, the futile intent of renal preservation in the sixth case is clearly associated with an oncologic unsafe procedure.

Master et al reviewed previous publications on management of isolated renal fossa recurrence (3). In their findings, several authors reported a substantial number of T1 cases that developed local recurrence. The purpose of their study was to describe the use of surgical extirpation with adjuvant intraoperative radiation (IORT) for the treatment of renal fossa recurrence. In their series most initial cases were pT3 (71%). They concluded that a significant fraction (30%) have durable results at 5-year follow-up with surgical resection and possibly adjuvant radiation therapy; However IORT did not proven to offer a survival advantage.

Treatment options for local recurrence after radical nephrectomy are limited. Observation alone is not an option, and there is no substantial evidence for the use of thermo ablation, radio-ablation or external beam radiation therapy (7,8).

<table>
<thead>
<tr>
<th>Case</th>
<th>Sex</th>
<th>Age</th>
<th>Side</th>
<th>Size</th>
<th>Initial Stage &amp; Grade</th>
<th>Time to local recurrence (months)</th>
<th>Size of LR (cm)</th>
<th>OR time (min)</th>
<th>Complication</th>
<th>Hospital stay (days)</th>
<th>Follow-up (months)</th>
<th>Results</th>
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<tr>
<td>1</td>
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<td>76</td>
<td>I</td>
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<td>M</td>
<td>59</td>
<td>I</td>
<td>6</td>
<td>Bellini, T1b</td>
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<td>81</td>
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<td>ND</td>
<td>CCRC, T3b</td>
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<td>M</td>
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<td>I</td>
<td>7</td>
<td>CCRC, T3b, F2</td>
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<td>9</td>
<td>180</td>
<td>Diaphragm open &amp; Collection drainage</td>
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CCRC: Clear cell renal carcinoma, NA: not available, DF: disease free, MTS: metastasis
reported pretreatment with antiangiogenics before radiofrequency ablation of large renal recurrent tumors with acceptable results (5). The authors administered Sunitinib 50 mg/d for 4 weeks every 6 weeks prior to radiofrequency ablation. Tumor size and perfusion value decreased significantly. It is logical to think that modulation of size and tumor vascularity could also aid in the treatment of renal fossa recurrence; however, to our knowledge, there haven’t been any reports to this regard. We believe that oncologic surgical resection with wide margins continues to be the best option in the absence of metastatic disease.

Schröedter et al reported their experience in 13 patients that underwent open surgical treatment of isolated local recurrence after radical nephrectomy. The authors pointed out that even though the difference in mean survival between survivors and nonsurvivors in their series failed to reach statistical significance (probably due to small sample size and large variances), it seems to indicate that patients with a truly isolated renal fossa recurrence can survive longer after surgical treatment and that an aggressive surgical approach is justified (1).

Not all patients will benefit from surgical resection. In an effort to predict the outcome of local recurrence resection (LRR), Margulis et al postulated a risk model based on: presence of positive margins after LRR, recurrent tumor size, presence of sarcomatoid features, abnormal alkaline phosphatase and abnormal serum lactate dehydrogenase at LRR. All these variables proved to be individual risk predictors for poor prognosis (9).

Surgical resection of local recurrence after radical nephrectomy can be challenging especially if tumor has grown next to major vascular structures. Even more challenging is performing this by means of laparoscopy. However, the benefits of a minimally invasive approach have been long proven. Decrease postoperative pain, hospital stay and faster convalescence are associated with a laparoscopic approach. These benefits may push surgeons to try minimally invasive strategies in this setting. The three reporting institutions are renowned for their experience in urolaparoscopy, nevertheless; not all surgeons in a department are skilled laparoscopists and surgical criteria may be personal. The latter happened in case number 1, in which open radical nephrectomy and laparoscopic resection of recurrence was performed at our institution by two different surgeons within 6 months.

Preoperative imaging is of utmost importance in order to determine mass location and boundaries. Hand assisted laparoscopy has been reported by Nakada et al in a 72 year old woman with recurrence of a Grade II, stage T3 renal-cell carcinoma (6). The patient was discharged on the 5th postoperative day and had no evidence of further disease at a 3-month follow-up. The authors believe that the ability to palpate the lesion in the renal fossa simplified identification and resection while minimizing blood loss and morbidity. Other authors have recently reported on laparoscopic resection of local recurrence after open radical nephrectomy with very similar findings (10).

Intraoperative ultrasound may be helpful in patients where mass identification proves to be difficult. However, and even though peritoneal adhesions were present in all cases, we did not encounter any unsurpassable obstacle during surgery, and the lesions were found after mobilizing surrounding structures without the need of hand assistance. There was no need for special laparoscopic equipment and trocar placement was identical to the one used in traditional laparoscopic radical nephrectomy or adrenalectomy as in case number 6. A pure laparoscopic approach was feasible allowing for minimum convalescence and short hospital stay. All patients were home before postoperative day 4. We believe this is one of first reports of a pure laparoscopic management in the setting of local recurrence after open radical nephrectomy and may prompt other authors to perform laparoscopic resection in this type of setting. However this is a retrospective study of a small series with short clinical follow-up. Further studies are needed to determine the role of minimally invasive surgery in this clinical setting.

CONCLUSIONS

Laparoscopic resection of local recurrence after open radical nephrectomy is a challenging but reproducible technique. There is still no consensus on an operative protocol for this clinical setting; however, as long as surgery is kept within the possibilities, a laparoscopic approach should be sought.

AUTHOR NOTE

This work was first submitted to the Journal of Endourology on the 25th of November 2009 with the initial first three cases. It was accepted on the 13th of February 2010, but revisions needed be made before final acceptance. After more than 7 months with no response, the paper was rejected without a solid cause. To our surprise a very similar


REFERENCES AND RECOMMENDED READINGS

(*of special interest, **of outstanding interest)


