

# Synchronous Bilateral Laparoscopic Radical Nephrectomy for Solid Renal Masses Using a Hybrid Approach

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## INTRODUCTION

Bilateral synchronous laparoscopic nephrectomies are rare procedures usually performed to treat uncontrolled hypertension and polycystic kidney disease in patients on dialysis and kidney transplant recipients.<sup>(1-3)</sup>

Only a few case reports exist today describing synchronous laparoscopic treatment of bilateral solid masses in the kidneys.<sup>(4,5)</sup> Both conventional ("pure") and hand-assisted techniques have been described to simplify port placements and standardize the procedure.<sup>(4-6)</sup> However, optimal methods and details of various approaches remain controversial. In this report, we demonstrate that as clinical scenarios differ (ie, body habitus, size, and location of diseased renal units), a customized approach may become necessary to treat these challenging cases. To the best of our knowledge, this is also the first reported case of bilateral posttransplant radical nephrectomy employing both conventional and hand-assist laparoscopy for synchronous bilateral renal masses.

## CASE REPORT

A 61-year-old African-American man with a history of end-stage renal disease, uncontrolled

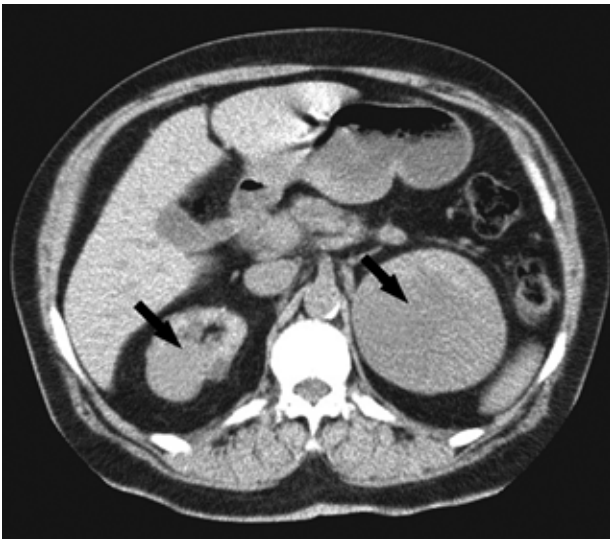
hypertension, insulin-dependent diabetes mellitus, and obesity was referred for the management of bilateral renal masses. He had undergone kidney transplantation 11 years prior to presentation. He measured 6 feet tall and weighed 111 Kg. Computed tomography revealed bilateral and multiple synchronous solid renal masses. The right kidney measured 11 cm × 8 cm and contained 3 distinct solid masses in the upper, mid, and lower poles measuring 3.5 cm, 3 cm, and 2.2 cm in diameter, respectively. The left kidney measured 18 cm × 12 cm and was replaced almost entirely with multiple large solid renal masses encompassing the upper, mid, and lower poles (Figures 1 and 2). The extraperitoneal transplanted kidney was moderately hydronephrotic and palpable in the right lower quadrant of the abdomen. It measured 13 cm in length, extended to the level of the umbilicus (Figure 3). Baseline serum creatinine was 2.1 mg/dL. Metastatic workup revealed no evidence of disease outside the renal units.

Considering the body habitus, the sizes of the individual renal units and their encompassing solid masses, and the location of a rather large transplanted kidney in the

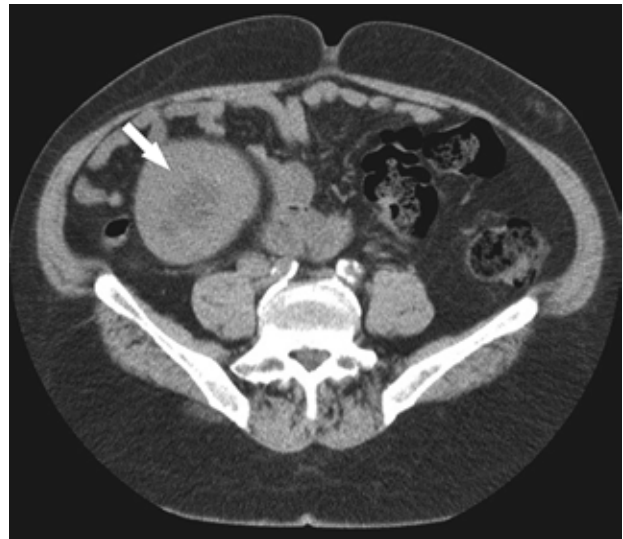
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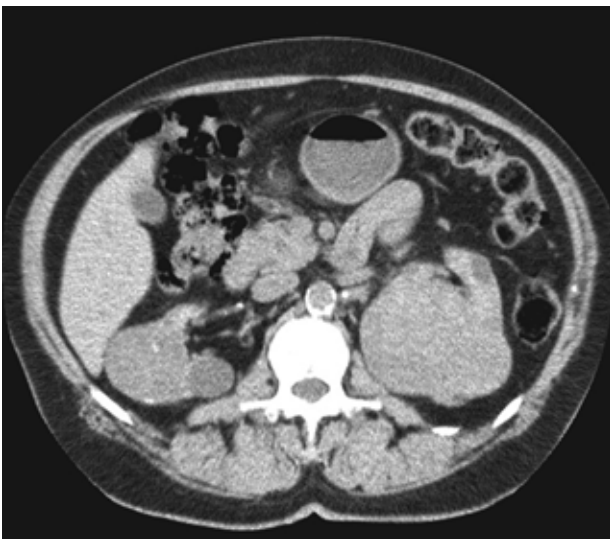
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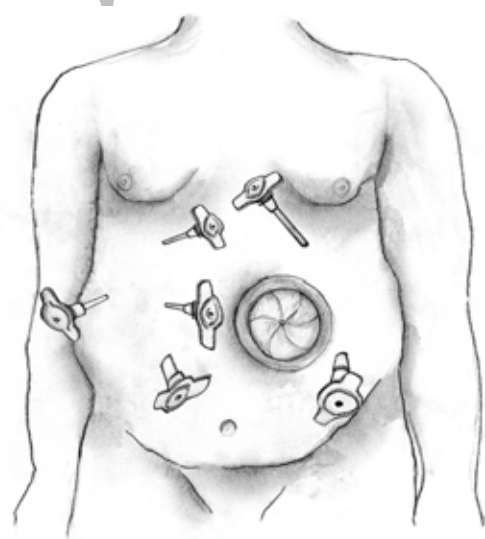
**Figure 1.** Computed tomography showed bilateral renal masses (arrows).



**Figure 3.** Computed tomography showed large transplanted kidney encompassing the right lower abdomen (arrow).



**Figure 2.** Computed tomography showed multiple renal tumors in both kidneys.



**Figure 4.** Schematic illustration shows port hand-assist and port positioning in the obese man.

right lower quadrant, a conventional (“pure”) transperitoneal laparoscopic radical nephrectomy was planned and executed on the right side, and a hand-assisted laparoscopy was performed for the left side.

## TECHNIQUE

The patient was placed in a modified semiflank position for both sides. On the right side, 4 trocars were placed as depicted in Figure 4. A 5-mm trocar was placed approximately 4 cm off midline above the umbilicus under direct

telescopic vision. The abdominal cavity was surveyed and there were minimal adhesions noted in the right lower abdomen. A 12-mm trocar (used for the vascular stapler) was inserted approximately 3 cm above the most cephalad portion of the large extraperitoneal transplanted kidney in the right lower quadrant. Two additional 5-mm trocars were then placed midway between the xiphoid process and the umbilicus (for the camera), and anterior axillary line at the level of the umbilicus, serving as the port for liver retraction. As dissection ensued, a single artery

and vein were identified and clipped/stapled. Once the right kidney was free of all attachments, it was placed in a large impermeable specimen bag and tied to prevent spillage of fluids. It was placed in the lateral gutter until the left side was completed.

Afterwards, the trocar sites were closed and the patient was repositioned for the contralateral side. A 7-cm longitudinal paramedial incision was made about the peri-umbilicus area and a hand-port disc was placed. A 5-mm trocar was placed through the lap disc and pneumoperitoneum was re-established. Under direct telescopic vision, a 12-mm trocar (used for the vascular stapler) was placed in the left lower quadrant midway between the umbilicus and the anterior superior iliac spine. An additional 5-mm trocar was placed midway between the xiphoid process and the umbilicus in the paramedial plane.

As depicted on the computed tomography image, the left kidney was very large, heavy, and bulky. There was a significant amount of inflammation about the hilum and the superior pole making the planes adherent and difficult to develop. The hand-assisted technique facilitated this dissection. A single vein and artery were identified and controlled in a similar fashion on this side. Once completely mobilized, the left kidney was also placed in an impermeable extralarge laparoscopic specimen bag. The hand-assist incision was extended another 3 cm inferiorly and both specimen bags were removed without difficulty. The fascia was closed along with the two trocar sites. The patient was extubated and transferred to the recovery room without incident.

## RESULTS

The operative time was 92 minutes for the dissection of the right kidney. Twenty minutes were spent on repositioning. The operative time for the left kidney was 124 minutes. The estimated blood loss was less than 100 mL. The postoperative period was uneventful. Hospital stay was 4 days and the patient returned to his normal activities within 2 weeks.

Final pathology revealed 3 distinct papillary and clear-type renal cell carcinomas on the

right kidney measuring 8 cm, 7 cm, and 6.5 cm in their greatest dimension. On the left, there were multiple large papillary-type renal cell tumors, the largest of which were 14 cm, 13 cm, and 9 cm in diameter. The patient has done well postoperatively with no evidence of tumor recurrence at 6-month follow-up.

## DISCUSSION

The role of laparoscopic nephrectomy for the management of kidney neoplasms has been well established.<sup>(7)</sup> On rare occasions, bilateral nephrectomy becomes necessary in the management of synchronous disease. In these cases, the kidneys can be removed safely and efficiently using laparoscopic techniques.<sup>(4-5,8)</sup> However, the optimal approach and techniques remain controversial.

Schwartz and Vestal recently described a case where pure bilateral nephrectomies were performed using only 5 ports without repositioning the patient.<sup>(4)</sup> As expected, the authors demonstrated a very good outcome with comparable operative times and excellent cosmetic results. It is conceivable that the operation may have been rendered “easier” by the fact that the patient described by these authors was a relatively small 42-year-old woman on dialysis with small kidneys. To their credit, the authors individualized and optimized their operative technique for their specific case. The problem remains that most patients treated with bilateral synchronous nephrectomies often suffer from very large polycystic kidneys in which the dissection, positioning, and trocar placement must be individualized.<sup>(9)</sup> Reports of hand-assisted laparoscopy to facilitate dissection in these complex situations indicate generally excellent results and outcomes.<sup>(3,6,9)</sup> The common goal is to provide rapid recovery, patient comfort, shorter hospital stay, and improved cosmetic results.

There are very few case reports that describe laparoscopic treatment of bilateral synchronous renal solid masses. Both “pure” and hand-assisted techniques have been described to simplify and standardize these operations.<sup>(4-5,8)</sup> To our knowledge, there are no reports of bilateral synchronous multiple renal masses in a

transplanted patient. There are also no reports of the concomitant use of hand-assistance and a pure laparoscopic approach in the same patient. The focus of this paper was to present a difficult clinical scenario in which an obese man with a history of prior kidney transplantation presented with bilateral multiple large tumors in the kidneys. A customized approach was devised to give this patient all the benefits of laparoscopy and minimally invasive surgery while limiting potential complications. Conventional “pure” laparoscopic radical nephrectomy was performed on the right kidney since the renal unit was relatively small and the hydronephrotic transplant kidney occupied much of the right lower abdomen. The left kidney was large and heavy. Therefore, a hand port was placed to facilitate dissection. Furthermore, the trocars had to be placed quite laterally on both sides in order to optimize access and to facilitate dissection in this obese patient. Although retroperitoneal laparoscopic dissection was feasible on the right side, this approach would not have been optimal for the left side: the sheer size of the left kidney and the necessity of placing the patient in a full flank position (with potential compression of the transplanted kidney) weighed against retroperitoneal dissection.

The traditional advantages of hand-assisted laparoscopy have been well described. Several studies have shown that hand-assisted techniques do not prolong hospital stay, nor do they increase narcotic requirements or adversely affect patient outcome.<sup>(10)</sup> The hand in the operative field allows for excellent manual retraction and blunt dissection with great vascular control. During laparoscopic radical nephrectomy, the hand port will facilitate removal of large renal units and allow strict adherence to surgical oncologic principles. If bleeding is encountered, manual compression of the vessels can be performed similar to open surgery. It became apparent early during our dissection that tactile feedback and manual retraction were critically important in removing the large left kidney.

The hand-assist port was used to extract both kidneys en bloc instead of morcellation. Organ extraction in the face of malignancy remains

controversial and some argue that the truly minimally invasive surgeon should morcellate renal masses within a specimen bag and extract them through one of the port sites. While it is not our intention to argue the long-debated topic of morcellation, we prefer precise tumor staging and duplication of open surgical techniques with proven oncologic equivalence.<sup>(10)</sup>

In summary, bilateral synchronous laparoscopic radical nephrectomy for the treatment of bilateral renal malignancies can be performed safely and efficiently. Single patient positioning, standardized trocar placement, and pure conventional laparoscopy may be preferred in most instances. However, the operative surgeon must be able to tailor his or her surgical technique to provide optimal methods of dissection and extraction in various clinical scenarios. Hand-assisted laparoscopy enables surgeons of various skill levels to expedite surgery while minimizing the risk of complications. The hybrid technique employed in this case allowed for efficient and expeditious synchronous bilateral radical nephrectomy in the face of a complex clinical scenario while providing all the benefits of minimally invasive surgery.

## CONFLICT OF INTEREST

None declared.

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