The New Journal of Urology
eISSN 3023-6940
doi: https://doi.org/10.33719/nju1664889

CASE REPORT

Bilateral Synchronous Renal Cell Carcinoma and Single-Stage Nephrectomy: A Case Report

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Submitted: *2025-04-05*
Accepted: *2025-06-03*

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Abstract

Bilateral renal cell carcinoma (RCC) is a rare condition, accounting for approximately 0.3% of all kidney cancer cases. There is no consensus on the surgical approach for treating bilateral synchronous renal masses. In this article, we present a single-stage surgical approach for a 76-year-old male patient with large bilateral synchronous RCC. Surgical intervention involved performing a right-sided partial nephrectomy concurrently with a total nephrectomy on the left kidney. No metastasis or local recurrence was observed in the postoperative 30-month follow-up. In selected cases, single-stage bilateral nephrectomy/partial nephrectomy can be safely performed in experienced centers.

Keywords: synchronous renal cell carcinoma, single-stage nephrectomy, partial nephrectomy, complication

INTRODUCTION

Bilateral renal cell carcinoma occurs in less than 5% of kidney cancer cases (2). Multiple tumors detected within six months are defined as synchronous (1). Bilateral synchronous renal cell carcinoma accounts for a small fraction of cases, with an estimated prevalence of 0.3% (2). There is no consensus on the surgical approach for treating bilateral synchronous renal masses. Evaluating the surgical strategies used in managing these patients in light of existing literature is crucial in shaping treatment protocols and guiding clinical practice. In light of these considerations, we found it valuable to report this particular case.

CASE REPORT

A 76-year-old white male patient was referred to our clinic after bilateral renal masses were detected during an evaluation for flank pain. His medical history included coronary artery disease and a 50 pack-year smoking history. There was no family history of genitourinary cancer. Physical examination revealed a palpable mass in the right flank region. Laboratory tests, including complete blood count, basic metabolic profile, and liver function tests, were within normal limits. Preoperative creatinine level was 1.2 mg/dL. Contrast-enhanced computed tomography (CT) of the entire abdomen showed a mass measuring 94x81 mm in the

Cite; Albayrak IH, Demir M, Pelit ES, Yagmur I. Bilateral Synchronous Renal Cell Carcinoma and Single-Stage Nephrectomy: A Case Report. New J Urol. 2025;20(3):208-211. **doi:** https://doi.org/10.33719/nju1664889

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posterolateral region of the right kidney and another mass measuring 79x75 mm extending from the lower pole to the renal hilum of the left kidney (RCC?) (Figure 1). Contrast-enhanced abdominal and thoracic computed tomography (CT) scans were performed to evaluate for metastasis. No metastatic lesions were detected on imaging.

A simultaneous bilateral nephron-sparing surgery was planned. A Chevron incision was made in the supine position to access the left kidney first (Figure 2). The tumor was found to have invaded the renal pedicle, making partial nephrectomy unsuitable, so left radical nephrectomy was performed (Figure 3B). The right kidney was then accessed, revealing a 9 cm mass extending throughout the entire kidney posteriorly. Right partial nephrectomy was performed by clamping the renal artery and vein (ischemia time: 19 minutes) (Figure 3A). The operation lasted 185 minutes. In the postoperative period, the patient received one unit of erythrocyte suspension. No complications other than hemorrhage were observed. Postoperatively, the patient was discharged with a creatinine level of 3.2 mg/dL on day six.

Pathological examination confirmed papillary renal cell carcinoma on both sides, with no tumor detected at the surgical margins. During follow-ups, a gradual decrease in urine output and a progressive increase in serum creatinine and BUN levels were observed. As a result, the patient was included in a routine dialysis program in the first postoperative month. At the 30-month follow-up, no local recurrence or metastasis was detected.

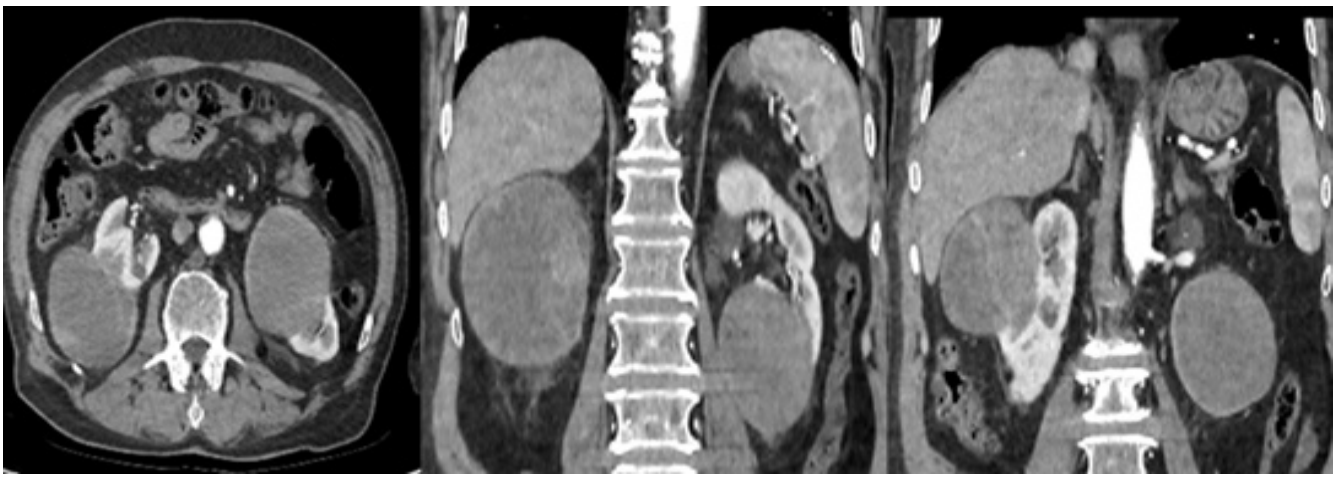

Figure 1. Contrast-enhanced CT images of tumors in both kidneys

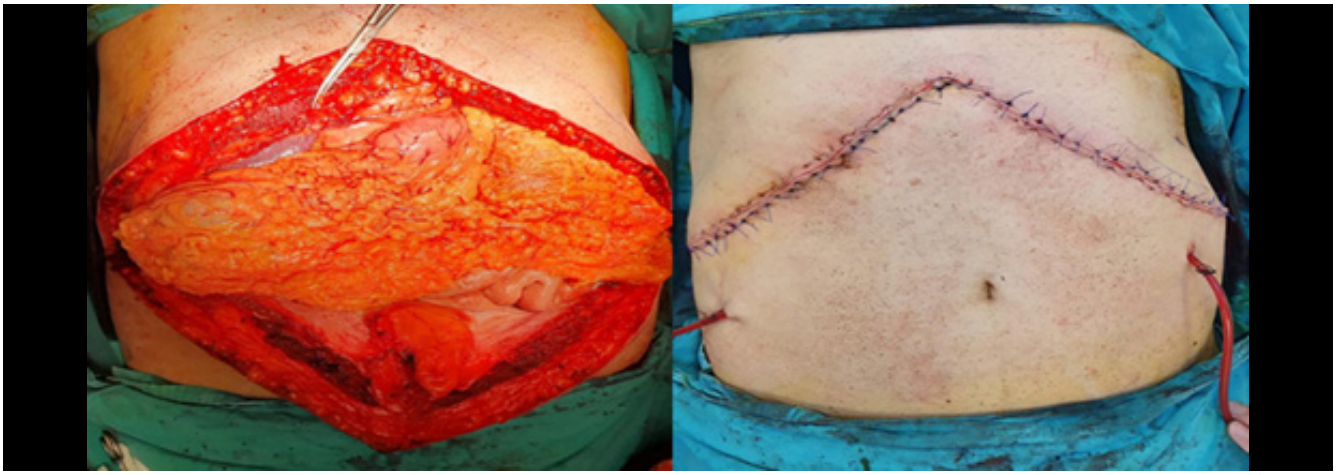

Figure 2. Chevron incision

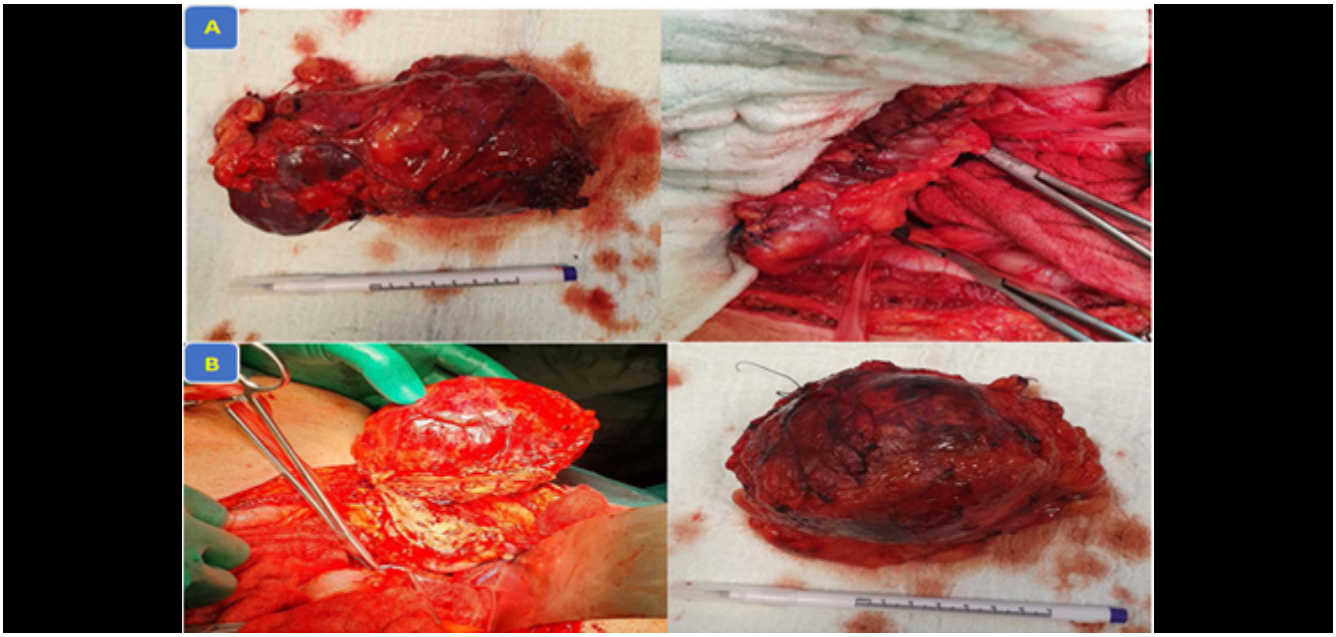

Figure 3.A. Right kidney mass and remaining renal tissue, B. Left kidney

DISCUSSION

Bilateral synchronous RCC is a rare condition (2). The etiology remains uncertain, whether it results from contralateral RCC metastasis or multiple de novo primary tumors (3). The optimal surgical strategy for managing such cases remains a topic of ongoing debate among clinicians. The choice between staged bilateral surgery and single-stage surgery remains controversial, and the decision should be made based on the physician's judgment and the patient's condition (4). Our patient was a refugee affected by the war in Syria and had to return to his country after treatment. Since long-term follow-up and treatment could not be performed, we obtained informed consent and preferred a single-stage surgery.

The literature points out that single-stage bilateral surgery provides oncological and functional outcomes comparable to unilateral surgery (5). Single-stage bilateral kidney surgery offers advantages such as reduced morbidity and mortality associated with anesthesia (6). Additionally, compared to staged nephrectomy, it leads to faster recovery and a shorter surgical process, allowing patients to return to their normal lives more quickly and improving their quality of life (7).

However, single-stage bilateral nephrectomy also has disadvantages. The complexity of the surgical procedure and the increased risk of postoperative complications must be considered. Factors such as the surgical team's experience, the patient's overall health status, and tumor characteristics should be taken into account (5,8). In a study by Mason et al. involving 76 patients who underwent single-stage bilateral partial nephrectomy, the procedure was shown to be safe, with a complication rate of 20% (6). In a study published by vignesh et al. in 2020, consisting of 107 patients, they found similar results between single-stage bilateral partial nephrectomy and staged bilateral partial nephrectomy (9). Kotb et al. reported that kidney function was preserved in a case series of three patients undergoing single-stage bilateral partial nephrectomy, with no Clavien-3 or higher complications observed (7). However, in this series, tumor sizes were <3 cm. On the other hand, Wang et al. found that in four patients who underwent single-stage bilateral surgery for renal tumors, renal failure developed within six years of follow-up, and they recommended staged surgeries instead (8).

Rather than hemorrhage, no early postoperative complications were observed in our case. Nevertheless, renal failure developed during follow-ups. We believe this was not due to simultaneous bilateral surgery. Given the tumor location and size, we had to perform total nephrectomy on the left side and remove more than 50% of the kidney tissue on the right side. Therefore, even if a staged nephrectomy had been performed, renal failure might have developed due to the small amount of remaining renal tissue.

In conclusion, the surgical approach for bilateral synchronous RCC remains controversial, and individualized evaluation is crucial. In our case, considering the tumor characteristics and the patient's overall condition, single-stage surgery was preferred and successfully performed. A review of similar cases in the literature suggests that single-stage surgery provides oncological and functional outcomes comparable to staged surgery while offering significant advantages by eliminating the need for additional surgical procedures. In our patient, combining radical and partial nephrectomy accelerated postoperative recovery and protected the patient from additional surgical and anesthesia risks. This case demonstrates that single-stage surgery can be a safe and effective option when careful patient selection is made.

Acknowledgements: The authors would like to thank Dr. Muhammet Emin Güldür for his cooperation especially on pathological assessments.

Funding: No funding

Data Availability Statement: None

Conflict of Interests: The authors declare that there is no conflict of interest.

Informed Consent: Written informed consent was obtained from the patient for publication of this case report.

Author's Contributions: IHA: writing of the case report. MD: operated the case and manuscript review. ESP: operated the case. IY: manuscript review.

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