# Ureteral Stump Metastasis of Renal Cell Carcinoma: Report of a Case

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## Abstract

Ureteral stump's metastasis of renal cell carcinoma is rare. We report a 32-year-old female with a huge metastatic involvement of the ureteral stump and utero-cervical structures about 2 years after a left radical nephrectomy. She underwent en-bloc resection of the mass in conjunction with total ureterectomy, bladder cuff excision and hysterectomy. The patient was referred to oncology department for additional treatment.

**Keywords**: Renal cell carcinoma; Metastases; Pelvis; Computed Tomography (CT) scan

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## Introduction

Renal Cell Carcinoma (RCC) has the characteristics of unpredictable presentation, tendency of progression, and propensity for early metastasis especially to the lymph nodes, lung, liver, bone, adrenal gland, brain, and skin [1, 2]. However ureteral stump's metastasis after extirpative nephrectomy for RCC is very unusual with less than one hundred reported cases in the literature [3]. We report herein on a patient with a huge metastatic involvement of the urethral stump about 2 years after an ipsilateral radical nephrectomy for RCC.

## Case report

In February 2012, a32-year-old female presented to gynecologic department of our hospital with a one-month history of pelvic pain and discomfort without any other gynecologic or urologic problem. She had history of left radical nephrectomy in April 2010 because of a 13×11 cm lower pole renal tumor (Figure 1). Pathologic examination demonstrated a Fuhrman grade 3/4 clear cell type of RCC without any capsular penetration or perinephric fat invasion. Gerota's fascia and distal urethral and vascular margins were all negative for tumor.

Physical examination showed a non-tender mass in left lower quadrant of abdomen. A large round shaped, hard, immobile mass detected in the left adnexal region on pelvic exam. Abdominal ultrasonography revealed a spherical, mainly solid, indeterminate adnexal mass on the left side measuring 10×8 cm (not shown). For further discrimination, the patient underwent Magnetic Resonance (MR) study (Figure 2). The mass was in close vicinity of bladder base, uterus cervix and lower segment of body, separate from intact left ovary and showed intermediate signal intensity on T1-weighted images and heterogeneous high signal intensity on T2-weighted sequences with central necrosis. After contrast administration, the mass was enhanced except for the central necrotic area.

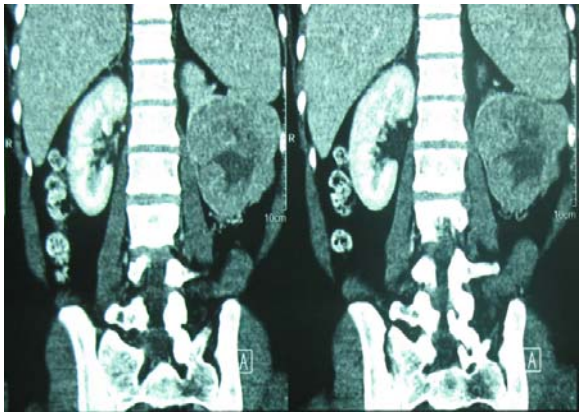

**Figure 1.** Coronal reconstruction of contrast-enhanced abdominal CT scan shows a solid heterogeneously-enhanced mass lesion has replaced left renal parenchyma, almost entirely, which proved to be renal cell carcinoma.

Neither pelvic lymphadenopathy nor ascites were detected. Our radiology staff re-evaluated the patient's previous images. Computed Tomography (CT) scan at the time of left nephrectomy did not show any ureteral lesion or hydronephrosis.

Laboratory data on admission revealed mild leukocytosis, with leucocyte of 10.4 × $10^3$/mL, severe hypochromic anemia with hemoglobin of 8.4 g/dL, normal serum creatinine level with value of 0.7 mg/dL and normal value of Erythrocyte Sedimentation Rate (ESR). The results of Alpha Fetoprotein (AFP), Beta Human Chorionic Gonadotropin (B-HCG), Carcinoembryonic Antigen (CEA) and cancer antigen 125 (CA-125) laboratory tests were all in normal range. In urinalysis no pyuria or hematuria was observed. The chest x-ray was normal.

She underwent exploratory laparotomy with low midline incision. The mass was identified in the posterior aspect of the bladder with adhesion to the antero-lateral portion of uterine body and cervix. The ureter was completely surrounded by the mass down to the ureterovesical junction (Figure 3). Frozen section of the mass revealed RCC, so en-bloc resection of the mass in conjunction with total ureterectomy and bladder cuff excision were adopted. Due to the mass adhesion to uterus, also a hysterectomy was performed for her.

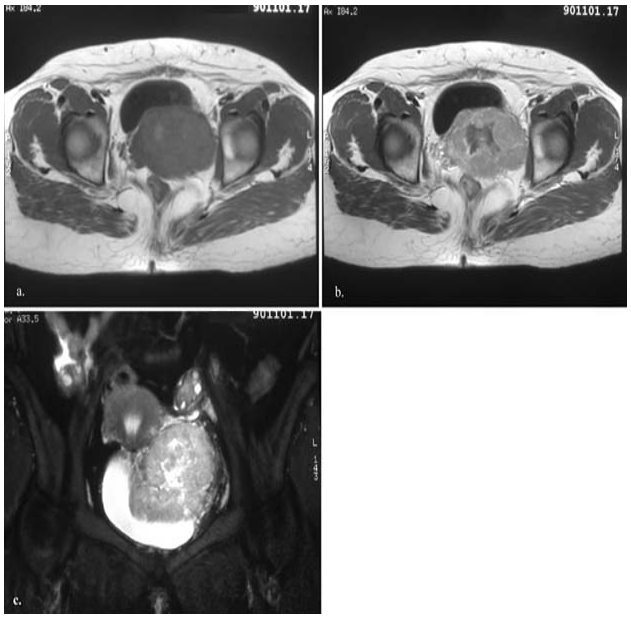

**Figure 2.** (a) Axial T1-weighted MR image shows a mass of intermediate signal intensity in left parametrium which demonstrates heterogeneous enhancement after contrast injection (b). There is mass effect on the bladder base and cervix. (c) Coronal fat-suppressed MR image depicts the left ovary separate from the mass. Central high signal implies necrosis.

## Pathologic findings

In macroscopic study the round mass consist of a gray brown soft to elastic tissue with irregular external surface measuring 6.5×4.5×2.5 cm. Serial sections revealed solid and cystic pattern with hemorrhagic and necrotic areas.

In microscopic view there was round to polygonal cells with abundant clear cytoplasm, round pleomorphic nuclei and prominent nucleoli with delicate branching vasculature. Based on the above-noted features, a diagnosis of Fuhrman grade 3/4 clear cell type of RCC was made.

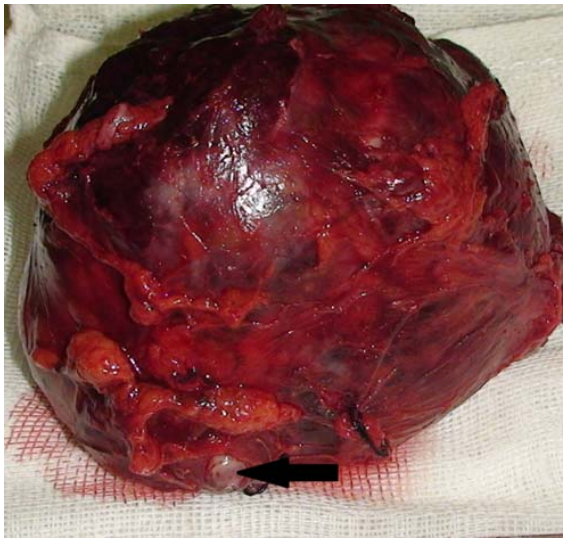

**Figure 3.** Surgical specimen shows a 6.5*4.5*2.5 cm mass with irregular external surface which contains the left ureter (black arrow).

## Follow up

The postoperative period was uneventful, and the patient was discharged from hospital after4 days. The patient was referred to oncology department; however, no conclusive data existed in the literature regarding the prognosis, optimal treatment, and follow up of such patients.

## Discussion

Renal Cell Carcinoma (RCC) is the most fatal urologic malignancy that plays a major role in cancer deaths in the developed countries [4]. Lack of early warning signs and presence of metastases at the time of diagnosis in 25 % to 30 % of patients are features of this tumor. Furthermore, 50% of treated patients will manifest local recurrence or distant metastasis during follow up [5]. RCC can recur at any time after nephrectomy and usually metastasizes via venous and lymphatic routes. The lung parenchyma, bone, liver, and brain are the frequent reported sites of metastasis [1].The occurrence of ureteral metastasis after previous radical nephrectomy is extremely rare. The majority of involvements were reported to be in the ipsilateral ureteral stump [3]. This metastasis could become large enough to adhere directly to genital tract such as our patient. Metastatic RCC may present with large adnexal masses. However, such involvement is rare; e.g. approximately 3% of ovarian tumors are due to metastases [6]. For example, Bozaci et al. reported a case of RCC metastases to uterine cervix and vagina 1 year after radical nephrectomy in a 19-year-old virgin girl. After tumor excision pathological diagnosis of specimen was clear cell variant of RCC showing identical immunohistochemical staining features with primary tumor such as strong cytoplasmic staining with vimentin, and diffuse membranous staining with CD-10 [7]. Mulcahy suggested that the most plausible mode of RCC spread to utero-cervical structures is retrograde venous extension [8].Our patient did not have contralateral renal tumor, lesions in central nervous system, skin and other viscera; so hereditary renal cancer syndromes were far from diagnosis.

Chemotherapy, hormonal therapy, and radiotherapy have generally proved ineffective for primary RCC or metastatic lesions, but an improved survival is seen with the use of immunotherapy with either interleukins or interferon [1]. However, immunotherapy of metastatic disease is challenging due to its modest results [9].There is a small subset of patients with solitary metastasis either at the time of presentation or during follow up after nephrectomy which have a better survival. Surgical resection of the renal tumor and solitary metastasis, if present, is still the treatment of choice [10]. For instance, Chiu and colleagues reported a 62-year-old female with ureteral stump metastasis 3 months whom underwent ureterectomy and a bladder cuff excision and the pathologic result showed clear cell adenocarcinoma as same as the primary renal tumor [11]. Also Abe et al. explained a 79-year-old woman with a history of right radical nephrectomy that intravenous pyelography showed a filling defect in her left ureter. Partial ureterectomy and end-to-end ureteroureterostomy were performed. Histology showed metastatic clear cell carcinoma consistent with the primary renal tumor [12]. Metastatectomy in these selected cases may results in 5 year survival rates up to 75%. This necessitates a regular follow up protocol for all patients irrespective of prognosis [13]. The mainstay for metastatic work up is cross-sectional imaging techniques such as CT and MRI. Whether pelvic images should be added in regular follow up remains controversial. Khaitan et al. stated that pelvic CT does not offer additional information in the vast majority of cases with RCC and should be performed selectively [14].

Rapid growth of the pelvic metastasis in a two year period is discernible in our case. The other notable point is simultaneous ureteral and utero-cervical involvement with rather intact ovaries which is in contrary to its higher frequency mentioned in the literature [15].

## Conclusion

Although RCC metastasis to genitourinary tract is a rare phenomenon, this does not hinder the need for adequate and regular surveillance including pelvic organs.

## Acknowledgment

None declared.

## Conflicts of interest

The authors have no conflict of interest in this article.

## Authors' Contribution

Ladan Ajori was the gynecologic surgeon who operated the patient and designed the study and reviewed the literatures.
Babak Javanmard was the urologic surgeon who operated the patient and designed the study and reviewed the literatures.
Aida Moeini contributed to the history taking and patient follow up process and also reviewed the literatures and wrote the paper.
Hooman Bahrami-Motlagh was the radiologist who reported the patient's imaging and reviewed the literatures.
Mohammad Mohsen Mazloomfard reviewed the literatures and wrote the paper.

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