Mixed Renal Cell Carcinoma With Metastasis To The Ipsilateral Ureter, A Case Report

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Citation

Abstract
We describe a patient who presented on two separate occasions with post-traumatic hematuria in which mixed renal cell carcinoma of the kidney and ureter were found. Diagnostic studies were conducted and a surgical nephrectomy as well as a ureterectomy were performed with histological reports confirming mixed renal cell carcinoma (RCC). There are no reports in the literature describing metastasis of RCC to an ipsilateral ureter. We describe such a case with a focus on RCC metastasis.

INTRODUCTION
Clear cell renal cell carcinoma (CRCC) comprises a majority of all renal tumors with 70 percent of renal masses being diagnosed histologically as CRCC. Clear cell RCC arise from the proximal tubule and macroscopically can appear either solid or cystic. Meanwhile, papillary renal cell carcinoma (RCC) only accounts for 10 to 15 percent of patients with RCC. Papillary RCC also arises from the proximal tubule but presents frequently as small, multifocal tumors in the early stage. Mixed renal carcinomas consisting of both clear cell and papillary RCC are very rare, but have gained increasing acknowledgment through the use of cytokeratin 7 staining, CD 10, and FISH. In cases of localized disease, radical nephrectomy has been the most popular surgical approach for management. Patients who present with metastatic renal cell carcinoma disease typically have involvement of the perinephric fat, ipsilateral adrenal gland, neighboring lymph nodes, the lungs, liver, bones, or the brain. Our case is unique in that there are no prior reports of RCC metastasizing singularly to the ipsilateral ureter without any local or distant sites of metastases. We report a case of mixed RCC metastasizing to the ipsilateral ureter.

CASE REPORT
A 36-year-old African American male presented to the ER with gross hematuria secondary to blunt trauma of the left flank region. The patient’s past medical history was significant for hypertension. He was referred to urology and a computed tomography scan with contrast displayed a left lower pole homogenous renal mass. The mass was 11.9 x 9.1 x 7.9 cm and had minimal peripheral enhancement. A left nephrectomy was then performed. A unifocal renal tumor was noted upon gross examination. The mass was a well circumscribed, yellow/red/tan appearing tumor with areas of friable and necrotic tissue located at the lower pole and measured 12 x 9.8 x 8.5 cm. The tumor did not grossly involve the renal pelvis. Renal tumor tissues obtained from the operation were fixed in formalin and embedded in paraffin. The specimens were serially sectioned using three-micrometer thick cuts. Microhistologic investigation revealed tumor extension into perinephric tissues, but not into the ipsilateral adrenal gland nor beyond Gerota’s fascia. The histology grade of the mixed RCC containing papillary and clear cell renal cell carcinoma was a Fuhrman Grade 3.

The patient’s clinical course was uneventful 4 months postoperatively until he presented with a four-day history of gross hematuria after blunt trauma that involved his left flank hitting a fence. At that time the patient reported left flank pain and hematuria. A diagnostic cystoscopy and left ureterogram were performed in which bleeding from the left ureteral orifice was visualized. Ureteral washings as well as bladder washings were sent for cytology. Cytology reported the presence of malignant cells consistent with residual renal cell carcinoma embedded within a blood clot measuring 0.8 x 0.6 x 0.2 cm. Subsequently the patient underwent a complete ureterectomy. The left ureter specimen measured 5 cm in length with a diameter ranging from 0.4 cm-0.7cm at either end. Examination of the tissue revealed a focal, microscopic cluster of malignant cell consistent with renal cell carcinoma. Immunostaining with CD 10 confirmed malignant RCC. A left pelvic lymph node was sampled and
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found to be negative for malignancy. The pathology results provide evidence that mixed RCC can arise within a single kidney and metastasize to the ipsilateral ureter.

PATHOLOGY
Tumor was noted macroscopically at the inferior anterior portion of the left kidney. The consistency of this tumor was soft and appeared to be friable and necrotic with gross hemorrhage. The well-delineated mass at the lower pole measured 12 x 9.8 x 8.5 cm with a focal inferior area of protrusion. The cut surface of the main tumor showed a yellow/red/tan/off-white color. The gross specimen is shown (Fig. 1).

Figure 1

Further examination revealed that the tumor located at the lower pole had microscopic invasion of the perinephric fat (Fig. 2). A diagnosis of mixed papillary and clear cell RCC was made and a Fuhrman grade 3 was assigned, as the nuclei were irregular with large and prominent nucleoli (Fig. 3).

Figure 2

Figure 3

Post-nephrectomy left ureter washings from a cystoscopy demonstrated small clusters of pleomorphic cells with prominent nucleoli embedded in a blood clot measuring 0.8 x 0.6 x 0.2 cm and consistent with residual renal cell carcinoma (Fig. 4).

Figure 4

After ureterectomy, the left ureter had a length of 5 cm and a variable diameter ranging from 0.4-0.7 cm at either end. The ureter was opened longitudinally and a focal cluster of malignant cells was noted with attachment to fibrovascular cores. Microscopic examination was consistent with mixed RCC and CD 10 immunohistological staining confirmed this diagnosis (Fig. 5).
DISCUSSION

This case report describes a unique finding of mixed RCC with metastasis to an ipsilateral ureter. The renal and ureter pathology is described to illustrate the appearance of a common origin of malignant cells as well as to identify the renal mass and metastatic ureter site as mixed clear cell and papillary renal cell carcinoma. This particular anomaly has not been previously described in the literature. Additionally, most renal tumors present in the fifth to seventh decade of life with a median age of diagnosis at 66 years. The patient in our case was 36 years old at diagnosis.

There are several risk factors that have been linked to RCC and these include smoking, hypertension, occupational exposure to toxic compounds, obesity, acquired cystic disease of the kidney, analgesic abuse nephropathy, and genetic predisposition. These documented findings are similar to our case report in that the patient had a history of hypertension. The literature suggests that hypertension predisposes to RCC development.

Although there have been no cases reported with mixed RCC metastasizing to a ureter, there is a report demonstrating RCC metastasis to a fourth digit in the right hand. Our case demonstrates that mixed RCC can metastasize to an ipsilateral ureter. Therefore clinicians should be aware that patients presenting with hematuria after a nephrectomy for RCC have the potential for developing metastatic RCC disease of the ureter.

CONCLUSIONS

We present a unique example of mixed clear cell and papillary RCC with metastasis to the ipsilateral ureter. Histology of the tissues at the time of nephrectomy and complete ureterectomy confirmed the diagnosis of mixed RCC. Risk factors for RCC seen in this patient include hypertension. Although there is a report of RCC uncommonly metastasizing to the finger, there have been no observed findings of mixed RCC metastasizing singularly to a ureter.
Figure 7

References
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