Renal cell carcinoma with solitary metastasis to the bladder: mode of spread and prognosis

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Recurrent renal cell carcinoma (RCC) that presents as a solitary metastasis to the bladder is extremely rare. We report our experience with two patients who presented with hematuria within 1 year of their radical nephrectomy.

Introduction

Solitary tumor metastasis to the urinary bladder arising from renal cell carcinoma (RCC) is extremely rare. There have been only a few case reports that have described this previously,¹⁻⁷ Table 1. We herein describe our experience with two RCC patients who presented with solitary metastases to the bladder following radical nephrectomy. Following endoscopic resection, both developed additional systemic recurrences. In this report, we discuss the potential mode of spread and outcome.

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Address correspondence to Dr. Bruce R. Kava, Department of Urology, University of Miami Miller School of Medicine, PO Box 016960 (M-814) Miami, Florida 33101 USA Both patients underwent endoscopic resection of the tumor metastasis. One patient developed a metastasis in the head of pancreas 12 months following endoscopic resection. The other patient developed bilateral femoral and spinal bone metastasis. Our aim is to report our experience, and discuss the proposed modes of spread, management and prognosis.

Key Words: renal cell carcinoma, solitary bladder metastasis, prognosis

Case report

Case 1

A 50-year-old non-hispanic, white male ex-smoker presented with right flank pain. Computerized tomography (CT) scan of the abdomen demonstrated a 3.7 cm x 3.8 cm right renal mass that was associated with tumor thrombus extending into the inferior vena cava (IVC), Figure 1. There was no evidence of metastatic disease.

The patient underwent right radical nephrectomy (RN). Due to gross tumor infiltration within the wall of the IVC, the IVC was resected and a vascular graft was placed. The final histopathology revealed that the tumor was a conventional clear cell renal cell carcinoma (RCC), Fuhrman grade 4, stage pT3cN0Mx. Follow up imaging at 2 and 6 months after surgery revealed no evidence of metastases.

| Report | Year | Age | Laterality | Systemic metastasis | Follow up months |
|---------------------------------|------|-----|------------|---------------------|------------------|
| Kagota et al ² | 2007 | 78 | Left | Lungs, bone | 20 (deceased) |
| Matsuo et al ¹ | 2002 | 77 | Right | No | 60 |
| Remis et al ⁴ | 1986 | 68 | left | No | 24 |
| Shiraishi et al ⁵ | 2003 | 64 | Right | Lung | 144 |
| Raviv et al ⁷ | 2002 | 19 | Right | Retroperitoneum | 108 |
| Chinegwundoh et al ⁶ | 1997 | 51 | Left | Disseminated | 4 (deceased) |
| RCC = renal cell carcinoma | a | | | | |

TABLE 1. A summary of previous reports of metastatic RCC to the bladder

Ten months following RN, the patient presented with gross, painless hematuria. Cystourethroscopy revealed a solitary, yellow mass on the dome of the bladder, Figure 2, prompting a transurethral resection (TURBT) to be performed. Histopathological examination of the resected tissue suggested a diagnosis of conventional clear cell RCC. Immuno-histochemical stains for CD10, carbonic anhydrase IX (CA IX), and PAX2 were positive, confirming the diagnosis of metastatic RCC. Twelve months following TURBT, CT scan identified a new, 7 mm enhancing lesion in the head of pancreas, Figure 3. The patient underwent pyloric-sparing pancreatico-duodenectomy (Whipple procedure). The final histopathology confirmed that it was metastatic RCC, which was resected with tumor free surgical margins, and no evidence of lymph node metastases.



Figure 1. CT scan of the abdomen showing right renal mass and IVC tumor thrombus.

The patient is currently without evidence of any further tumor recurrence at 5 months following surgery.

Case 2

A 51-year-old Caucasian male with a 25 pack per year smoking history presented with gross, painless hematuria. ACT scan showed an enhancing left upper pole renal mass. The patient underwent left RN. Histopathology demonstrated a 4.6 cm Fuhrman grade 1 conventional type RCC, with direct invasion of the left adrenal gland. pT3a, N0, MX.

Ten months following RN, a CT scan suggested a bladder mass. Cystourethroscopy and TURBT were performed, which confirmed the diagnosis of metastatic RCC. Thirteen months following TURBT, the patient presented with left hip pain. Bone scan revealed that he had uptake in the left femoral neck, as well as several thoracic vertebral bodies. The patient underwent a left



Figure 2. Yellow bladder mass on cystoscopy.



Figure 3. CT scan of the abdomen showing an enhancing 7 mm lesion in the head of pancreas "see arrow".

long-stem hemiarthroplasty. The final histopathology confirmed metastatic RCC, and the patient underwent adjuvant external beam radiation therapy for pelvic and vertebral metastases. Eleven months later he once again, presented with metastases in the lumbar spine and the femoral shaft. Curettage and adjuvant radiation was performed. The patient remains alive, with no additional metastases 2 years later.

Discussion

RCC is the third most common urological malignancy.⁸ Despite the fact that the majority of renal tumors are discovered early, many patients with RCC continue to present with metastases. Additionally, metachronous metastases may occur years after removal of the primary tumor.⁹

RCC rarely metastasizes to the urinary bladder. When it does, it is usually associated with other synchronous metastases. There are very few case reports in the literature of the presence of a solitary bladder metastasis, as in our cases.

The mode of spread of RCC to the bladder is controversial.³ One hypothesis suggests that it may occur via hematogenous venous embolization of tumor cells, through the left renal vein. This does not explain metastases from right sided tumors.⁴ Although, the bladder and kidneys do not share the same lymphatic drainage, a lymphatic mode of spread has been proposed.¹ Finally, others have suggested that bladder metastases may occur via direct spread and implantation through the collecting system.⁷ Ureterocalicyeal system invasion was absent in both of our patients, making this a less likely argument.

We propose that solitary metastatic RCC to the bladder is representative of systemic disease, and this

may only become apparent in follow up. Both of our patients developed multiple metastases within a short time after the discovery of bladder metastases.

Due to the rarity of metastatic RCC to the urinary bladder, there are no clear management guidelines. Endoscopic resection, partial, and complete cystectomy are among the reported alternatives for solitary metastases to the bladder.¹ In our cases however, the more radical approaches would not have been curative. Moreover, endoscopic resection for these non-muscle invasive tumors has provided long term, local control in the urinary bladder.

Conclusion

The presence of a solitary tumor metastasis to the urinary bladder from RCC may be indicative of occult systemic metastases that may become apparent with follow up. Complete resection by TURBT and close monitoring of these patients provide the best management strategy.

References

- 1. Matsuo M, Koga S, Nishikido M et al. Renal cell carcinoma with solitary metachronous metastasis to the urinary bladder. *Urology* 2002;60(5):911-912.
- 2. Kagota M, Irie K, Hosaka K, Takezaki T. Bladder metastasis of renal cell carcinoma; a case study. *Hinyokika Kiyo* 2007;53(8):571-574.
- 3. Mayer WA, Resnick MJ, Canter D et al. Synchronous metastatic renal cell carcinoma to the genitourinary tract: two rare case reports and a review of the literature. *Can J Urol* 2009;16(2):4611-4614.
- 4. Remis RE, Halverstadt DB. Metastatic renal cell carcinoma to the bladder: case report and review of the literature. *J Urol* 1986; 136(6):1294-1296.
- 5. Shiraishi K, Mohri J, Inoue R, Kamiryo Y. Metastatic renal cell carcinoma to the bladder 12 years after radical nephrectomy. *Int J Urol* 2003;10(8):453-455.
- 6. Chinegwundoh FJ, Khor T, Leedham PW. Bladder metastasis from renal cell carcinoma. *Br J Urol* 1997;79(4):650-651.
- 7. Raviv S, Eggener SE, Williams DH, Garnett JE, Pins MR, Smith ND. Long-term survival after "drop metastases" of renal cell carcinoma to the bladder. *Urology* 2002;60(4):697.
- Ciancio G, Manoharan M, Katkoori D, De Los Santos R, Soloway MS. Long-term survival in patients undergoing radical nephrectomy and inferior vena cava thrombectomy: single-center experience. *Eur Urol* 2010;57(4):667-672.
- Sim SJ, Ro JY, Ordonez NG, Park YW, Kee KH, Ayala AG. Metastatic renal cell carcinoma to the bladder: a clinicopathologic and immunohistochemical study. *Mod Pathol* 1999;12(4):351-355.