CASE REPORT

Rapid metachronous bladder metastasis of type 2 papillary renal cell carcinoma

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ABSTRACT

Renal cell carcinoma (RCC) frequently spreads to distant organs like the lung, lymph nodes, bone, and liver. However, there have been some reports of RCC bladder metastasis. We present a case of a 61-year-old man presented with total painless gross hematuria. The patient had a history of right radical nephrectomy for papillary (type 2) RCC, high-grade, pT3a with negative surgical margins. There was no evidence of metastases on 6-month surveillance CT. After one-year post-operation, at this current admission, the cystoscopy discovered a solid bladder mass away from the trigone in the right lateral bladder wall. The resected bladder mass was metastatic papillary RCC with PAX-8 positive but GATA-3 negative on immunostaining. A positron emission tomography scan confirmed multiple lung, liver, and osseous metastases. This case report can highlight the importance of having bladder metastasis in RCC mind, although rare, and may necessitate the surveillance measures like urine analysis at more frequent interval and CT Urography instead of regular CT to detect the RCC metastatic bladder cancer at early stage.

KEYWORDS: Renal cell carcinoma; Bladder metastasis; Papillary cell

INTRODUCTION

Renal cell carcinoma (RCC), depending on the characteristics of the malignancy, can be managed in a variety of ways, i.e., active surveillance, ablation, or potentially surgery. According to the 2022 World Health Organization classification RCCs histologically fall under the clear cell, papillary, oncotic and chromophobe, collecting duct, and other renal carcinomas categories [1]. Papillary, which pertains to this case, can be further subdivided into two distinct morphological groups, type 1 and type 2 [2]. Type 1 and 2 diseases are different in terms of clinicopathologic characteristics, with type 2 disease has a relatively poor prognosis compared to type 1 [3].

Recurrence of RCC is not uncommon following treatment. Stage 3 tumors have been found to recur at a rate of 26% [4], 17 to 23 months after the initial nephrectomy [5]. RCC commonly metastasizes to distant organs. The lung (54%), lymph nodes (22 %), bone (20 %) and liver (15 %) are the most common sites of recurrence [6]. However, RCC can spread to almost any organ in the body, including the thyroid [7], pancreas [8], skin [9], heart [10], and bladder [11]. The metastatic spread from RCC to the bladder accounts for 2% [12]. Until 2015, 65 cases of metastases to the bladder had been identified and reported. A retrospective review of 65 reported cases of RCC metastasis to the bladder revealed that it occurred both synchronously (23%) and metachronously (77%), with the median time for metachronous bladder metastasis following RCC diagnosis being 33 months [12]. Among the 65 cases, only two cases of papillary renal cell carcinoma were reported. Here we report a case of papillary type 2 RCC developing rapid metachronous metastases in the bladder. Along with this case report, the guidelines for patient follow-up after treatment of non-metastatic renal cell carcinoma papillary type 2 will be discussed.

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CASE PRESENTATION

A 61-year-old gentleman presented with total painless gross hematuria and low hemoglobin. One year prior to admission, the patient had right radical nephrectomy for papillary RCC (type 2), high-grade, pT3a with, node negative and clean surgical margins. There was no evidence of metastases on preoperative CT staging. The surveillance CT and urine analysis were performed on 6 month-follow up showing no evidence of recurrence or metastases.

Upon current admission, the cystoscopy discovered a solid and vascular bladder mass away from the trigone in the right bladder wall. The pathology reported metastatic papillary RCC with PAX-8 positive but GATA-3 negative on immunostaining (Figure 1).

A computed tomography (CT) of the chest, abdomen, and pelvis revealed the residual bladder mass as well as multiple,

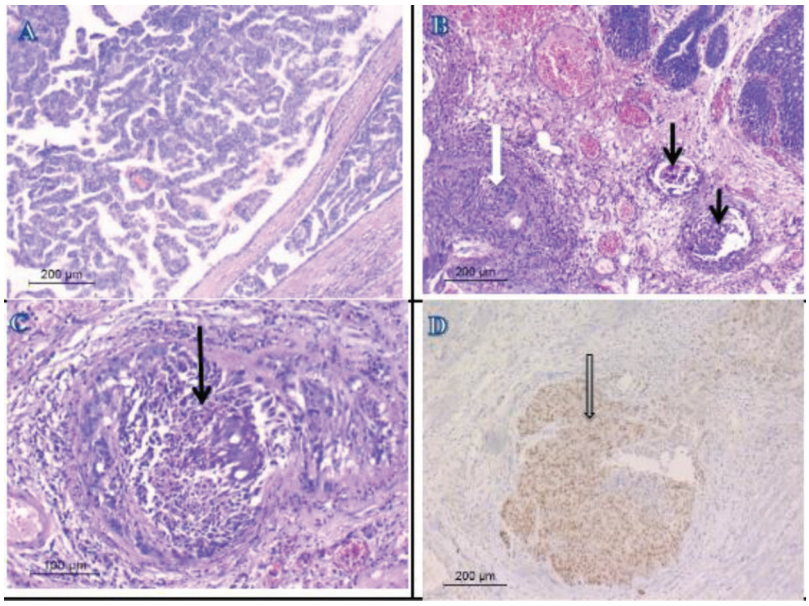

Fig. 1. Primary renal cell carcinoma of type II papillary carcinoma (A) (HE, x200); Bladder tissue showing hyperplastic urothelium at the upper right corner and tumor tissue within the lamina propria at the left lower corner (white arrow) with similar intravascular tumor tissue (black arrows) (B) (HE, x200); Higher power of tissue within vascular lumina in the lamina propria of the urinary bladder (C) (HE, x400); Positive PAX-8 immunostaining within tumor tissue (D) (IHC, Anti-PAX-8 Ab, x200).

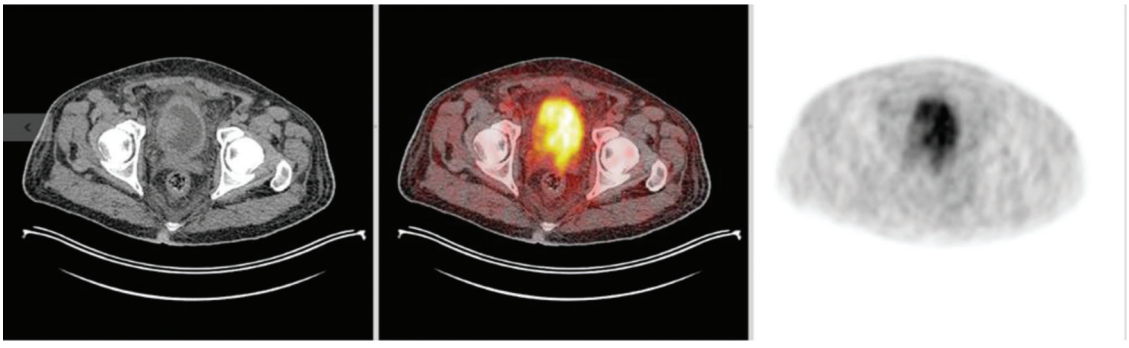

Fig. 2. A computed tomography (CT) of the pelvis revealed the residual bladder mass.

large metastases to the lungs and liver, a clear right renal fossa, and a normal left kidney (Figures 2 and 3).

DISCUSSION

In the case of RCC with no evidence of metastases, surveillance remains the standard of care after surgery to provide ongoing monitoring for post-operative complications, renal function, recurrence, and metastases development [13]. Individualized surveillance plan after surgery should be set depending on the risk of recurrence or metastases, i.e., considering tumor grade, stage, histological subtype, and clinical symptoms.

According to stage-stratified surveillance, this case with an RCC staged pT3a falls under high-risk group for recurrence. The recommendation for high-risk disease is to conduct a clinical assessment including blood chemistry and a chest X-ray (or chest CT) within three months after surgery, then, every six months for the next three years, and then yearly. Abdominal CT or MRI is also recommended at 6, 12, 18, 24, 36, and 60 months, then every two years [13]. The 6-month CT scan was negative for any recurrence or metastasis.

When it comes to histological subtypes, the latest Canadian Urological Association guideline lacks the information on the recurrence or metastasis prognosis of type 2 papillary RCC while it states type 1 papillary RCC has a better prognosis than other subtypes [13]. The Results of a systematic review and metaanalysis showed that type 2 papillary RCC was associated with a worse overall survival [14].

In addition, there is some evidence highlighted in the guidelines that indicates a worse prognosis in high-grade clear-cell RCC when the Furhman nuclear grade is used [13]. Wagener et al. found no differences in cancer-specific death between clear-cell and type 2 papillary RCC, indicating that the treatment approach for both should be the same [2]. The presence of more than 50% of tumor cells with high Fuhrman nuclear grade in papillary RCC was predictive of tumor metastasis in a study conducted by Warrick et al. [15].

Bladder cancer typically manifests as gross, visible hematuria; however, isolated microscopic hematuria

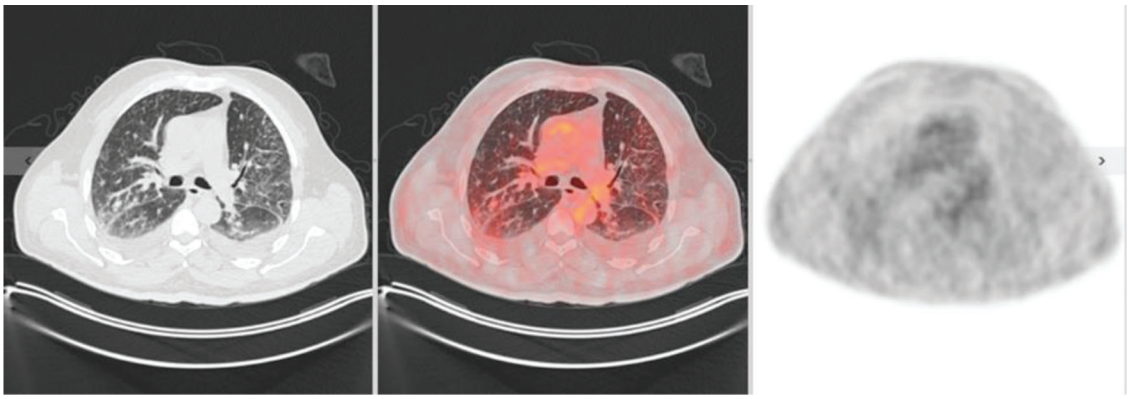

Fig. 3. Chest and pelvis CT revealed the residual bladder mass as well as multiple, large metastases to the lungs.

(urinalysis showing 3 red blood cells per high-power field) can also occur [16]. The risk of bladder cancer in patients with microscopic hematuria is approximately 4% which increases with history of genitourinary tract malignancies. Therefore, the presence of this finding would warrant further examination by cystoscopy [16,17]. Consequently, considering the integration of routine microscopic hematuria examination could allow for early detection of metastases of RCC to the bladder, and potentially better outcomes.

Physical examination, radiological imaging, and serum biochemistry testing are currently recommended after treatment for non-metastatic RCC at intervals that vary depending on the patient's malignancy [13]. These current surveillance lacks in measures, e.g. microscopic urine analysis and/or cystoscopy, for early detection of bladder metastasis.

CONCLUSIONS

Although uncommon, papillary type 2 RCC can spread to the bladder. This case may highlight the fact that surveillance measures like microscopic urine analysis can be performed at more frequent intervals and Computed Tomography Urography can also substitute for regular CT in the current guidelines in order to detect the RCC metastatic bladder cancer at early stage.

Conflicts of interest

No conflicts of interest are to be declared.

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Informed consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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