

Oncology

An unusual case of renal cell carcinoma with tumor thrombosis of the proximal ureter

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Introduction

Renal cell carcinoma (RCC) is the most common type of malignant mass found in the kidney. It demonstrates well-described and relatively predictable patterns of growth and extra-renal spread – all of which are used for clinical staging of the disease. While invasion of surrounding tissue is not uncommonly seen, RCC is also known to form tumor thromboses within the renal vein and the inferior vena cava (IVC). Thrombotic spread within the lumen of the collecting system and the proximal ureters, however, is a rare event that has seldom been described in the literature and has not been studied in the context of tumor staging. We present the case of a 79-year-old male who presented with a large renal mass on imaging suspicious for RCC. Upon post-operative histopathological analysis, RCC was confirmed and thrombotic spread of tumor within the renal pelvis and into the proximal ureter was discovered.

Case report

Our patient is a 79-year-old male who has been seen previously by the outpatient urology clinic at our large academic hospital for management of chronic interstitial cystitis (IC). On annual visit, he was noted to have intermittent gross hematuria and underwent a hematuria work-up. Abdominal CT scan identified an incidental renal mass with features suspicious for malignancy. A confirmatory MRI further characterized the left renal mass with dilation of the proximal collecting system due to obstruction of the ureter (Fig. 1). Given these obstructive

findings, he underwent ureteroscopy. This revealed clot-like material within the proximal ureter that appeared grossly consistent with possible tumor thrombus. He then underwent robot assisted laparoscopic radical nephrectomy one week later and suffered no complications. Palpation of the gross specimen following the procedure indicated a cord-like mass within the ureter. He was discharged home on post-operative day 4.

Histopathological analysis of the surgical specimen revealed a 9.5 × 6.0 × 6.0 cm clear cell renal cell carcinoma (ISUP Grade 4 of 4) with necrosis and pathological stage T3aN0 due to “invasion of the pelvicalyceal system”.¹ Tumor extension was observed within the lumen of the proximal ureter – a highly unusual pattern of RCC spread (Figs. 2 and 3). Intraoperatively, the ureter was dissected and removed at the level of the iliac vessels. Additional gross tumor extension was identified within the perinephric tissue, the renal sinus soft tissue, and the pelvicalyceal system which was nearly replaced by tumor. The renal vein was free of tumor.

Discussion

Renal cell carcinoma is a relatively common malignancy, representing 3.8% of new cancer diagnoses in the U.S.² Upon diagnosis, it has been reported that between 25 and 32% of RCC is locally advanced or with metastatic spread.² The 5-year survival rate varies depending on stage, from 92.6% in localized malignancies to 66.7% in locally advanced disease and 11.7% in tumors with metastatic spread.² Proper staging of RCC is paramount for prognosis and treatment planning.

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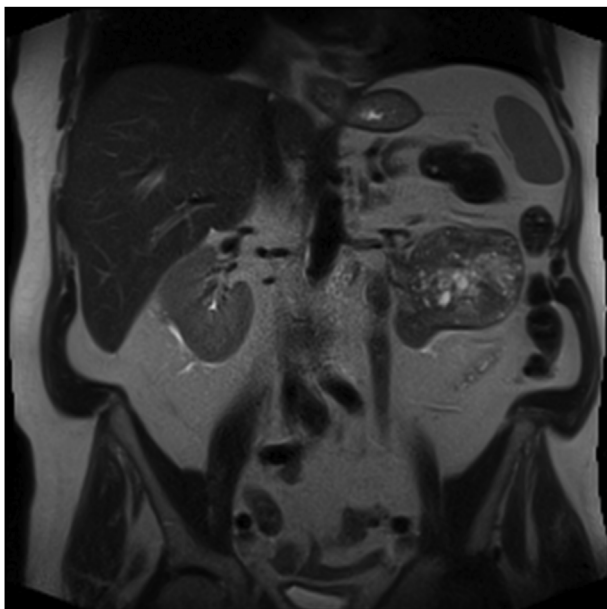


Fig. 1. T2-weighted MRI demonstrating large left renal mass and dilated ureter.



Fig. 2. Radical nephrectomy specimen opened from the anti-hilar aspect with mixed exophytic and multinodular endophytic carcinoma replacing much of the renal parenchyma, including extension into the pelvicaliceal system and luminal obliteration of the proximal ureter by tumor thrombus (arrow).

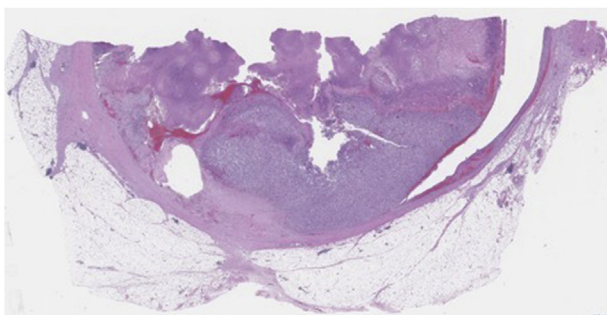


Fig. 3. Low-power histologic hemi-section of tumor thrombus within dilated ureter (hematoxylin and eosin).

TNM staging guidelines incorporate thrombotic spread into the renal vein and the inferior vena cava and define these characteristics as T3a-c. Tumors with these characteristics correlate with a prognostic stage group of Stage III or above.¹

In addition to the prognostic value of renal vein or IVC thrombosis, the presence of urinary collecting system invasion (UCSI) has also been studied with respect to tumor prognosis. Although it is not included in the current TNM staging guidelines, it has been suggested in the literature that UCSI is an important independent prognostic factor for RCC when present.³

Tumor thrombosis of the collecting system has not been well studied, however. This is largely due to the rarity of this tumor characteristic, with only a few cases of tumor thrombotic spread to the ureters reported in the literature.^{4,5} Previous cases are distinct from the case presented above, however, in that the extent of the primary tumor is relatively less advanced. Fujita et al.⁸ describe a thrombus 17 cm in length and filling the majority of the ureteral lumen.⁴ Finally, the case report by Parikesit et al. describes a tumor that had obliterated the kidney parenchyma entirely.⁵ Thrombotic ureteral extension was suspected on imaging and confirmed by pathological analysis. In contrast to previous cases, our case represents a relatively small focus of RCC with little perinephric spread and thrombosis only of the proximal ureter.

Renal cell carcinoma with tumor thrombus in the renal pelvis and ureter is rarely described. Due to rarity of this tumor characteristic, it is unclear what luminal spread of RCC within the ureter portends with respect to malignant or prognostic potential and how it should affect the TNM staging of renal cell carcinoma.

Conflicts of interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.eucr.2018.12.009>.

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