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Thrombus-like Tumor of Renal Cell Carcinoma Mimicking Transitional Cell Carcinoma of Kidney: A Case Report

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ABSTRACT

Renal cell carcinoma (RCC) is the most common malignancy of the kidney. It is not commonly form tumor thrombus in the ureter or renal pelvis. A 29-year-old woman presented with asymptomatic gross hematuria. Contrast CT study revealed a tumor suspected to be a Transitional Cell Carcinoma (TCC). However, tumor thrombus was found in the renal pelvis and ureter. We performed Nephroureterectomy, bladder cuff excision, and lymph node dissection, and the tumor was diagnosed histopathologically as RCC. We report a very rare case of thrombus-like tumor of renal cell carcinoma mimicking transitional cell carcinoma of kidney.

Introduction

According to GLOBOCAN in 2012, the incidence and mortality rate of kidney cancer was 2,4% and 1,7% worldwide, respectively.[1] Approximately 25% to 30% of patients with renal cell carcinoma present with advanced stage disease.[1] Local renal tumor growth and extension may involve the perirenal fat, adrenal glands, renal vein, inferior vena cava, urinary collecting system and/or adjacent retroperitoneal structures, this type of tumor rarely forms in the renal pelvis nor the ureter.[2] Currently, no study has characterized Urinary Collecting System Invasion (UCSI) of RCC including thrombus-like tumor in the renal pelvis and/or ureter as a criterion for staging renal cell carcinoma.[2]

We report a very rare case of RCC that has thrombus-like tumor growth inside, without invading, the ureter mimicking TCC of kidney.

Case presentation

A 29 year old woman came with chief complaint of asymptomatic hematuria since 5 months ago. On physical examination, there was pain on palpation on the left flank with no palpable mass. Laboratory (Table 1), contrast abdominal CT scan (Fig. 1), cystoscopy (Fig. 1) and chest X-ray was performed, no metastasis was found. The patient was diagnosed with Upper Tract Urothelial Carcinoma (UTUC) cT3N2M0. An open left nephroureterectomy, bladder cuff excision, and left paraaortocaval lymph node dissection were performed.

The tumor had replaced the entire kidney parenchyma, making identification of the pelviocalyceal system challenging. Histologically, there were 2 types of tumor found (Fig. 2A). The tumor had invaded the lymphovascular, pelviocaleceal system, and along the inside of the ureter (Fig. 2D). The tumor was then diagnosed as renal cell carcinoma mixed type between clear cell and papillary cell type 1, with Fuhrman grade 3. There were 12 out of 18 lymph

Table 1
Laboratory findings

	Result	Normal levels	Units
Hemoglobin	7,3	12–14	g/dL
Blood calcium	8,5	8,4–10,2	mg/dL
Lactate dehydrogenase	1101	< 215	U/L
Albumin	3.85	3,5–5,2	g/dL
Ureum	25	< 50	mg/dL
Creatinine	1	0,6–1,2	mg/dL
Urinalisis			
•Erythrocyte	70	0–2	/High power field
•Leucocyte	18–20	0–5	/High power field

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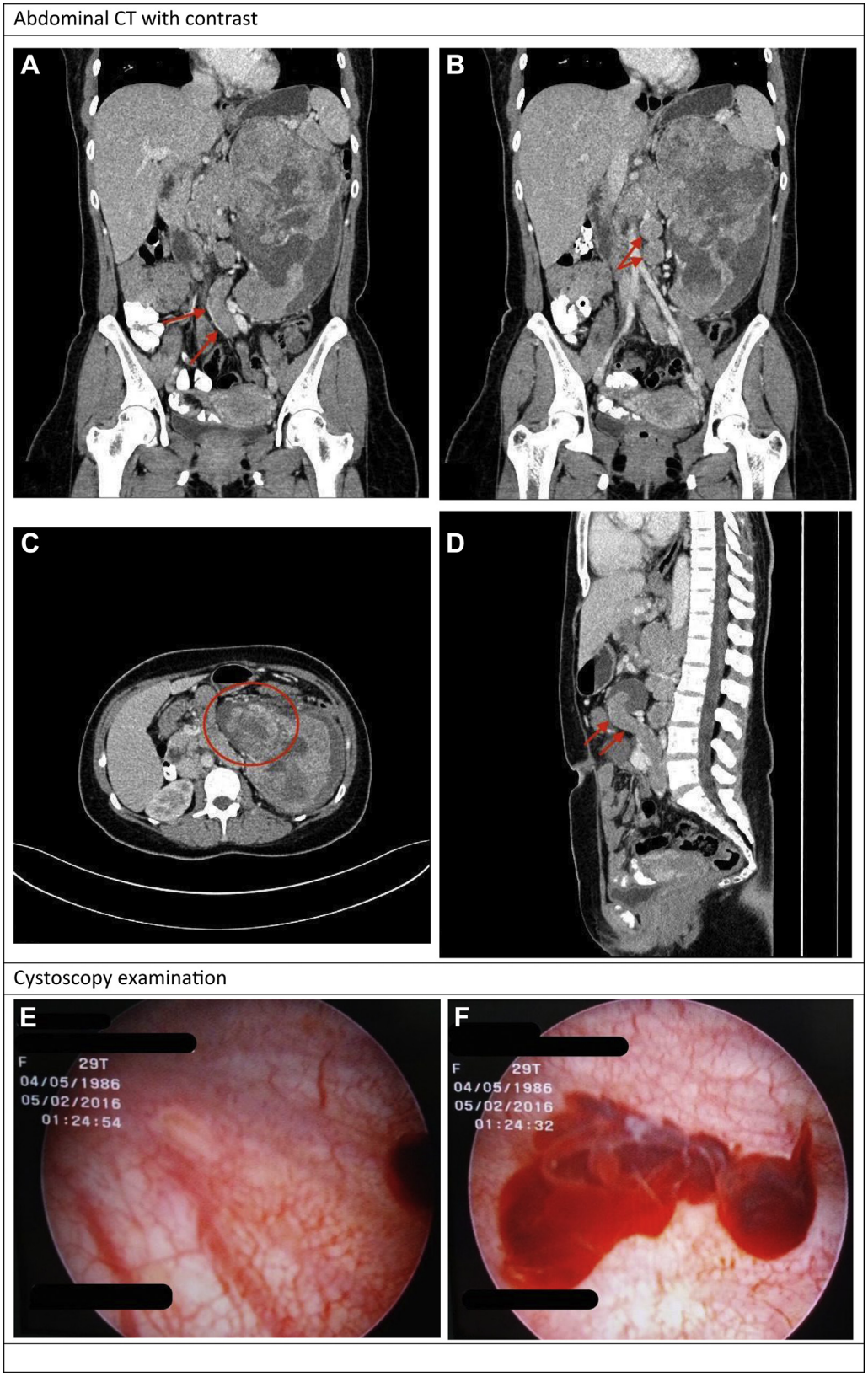

Figure 1. Preoperative abdominal CT scans. The kidney was enlarged (± 19,4 × 15 × 10,9 cm) and there was mass in the superior until inferior pole of the left kidney. Contrast imaging shows thrombus-like mass extending from the renal pelvis towards the distal left ureter that enhance after contrast administration (A, arrows) and multiple enlargements of paraaorta and paracaval lymph nodes with size of ± 1,8 cm (B, double arrow) that caused shifting of the aorta and inferior vena cava to the left, pancreas towards the anterior, and narrowing of the left renal vein. Thrombus-like mass have encompass the proximal ureter (C, circle) towards the tortuous length of the ureter (D, arrows). Cystoscopy examination. Normal right ureter orifice (E). Blood clot that originated from the left ureter orifice (F). Note there are no obvious tumorous lesions.

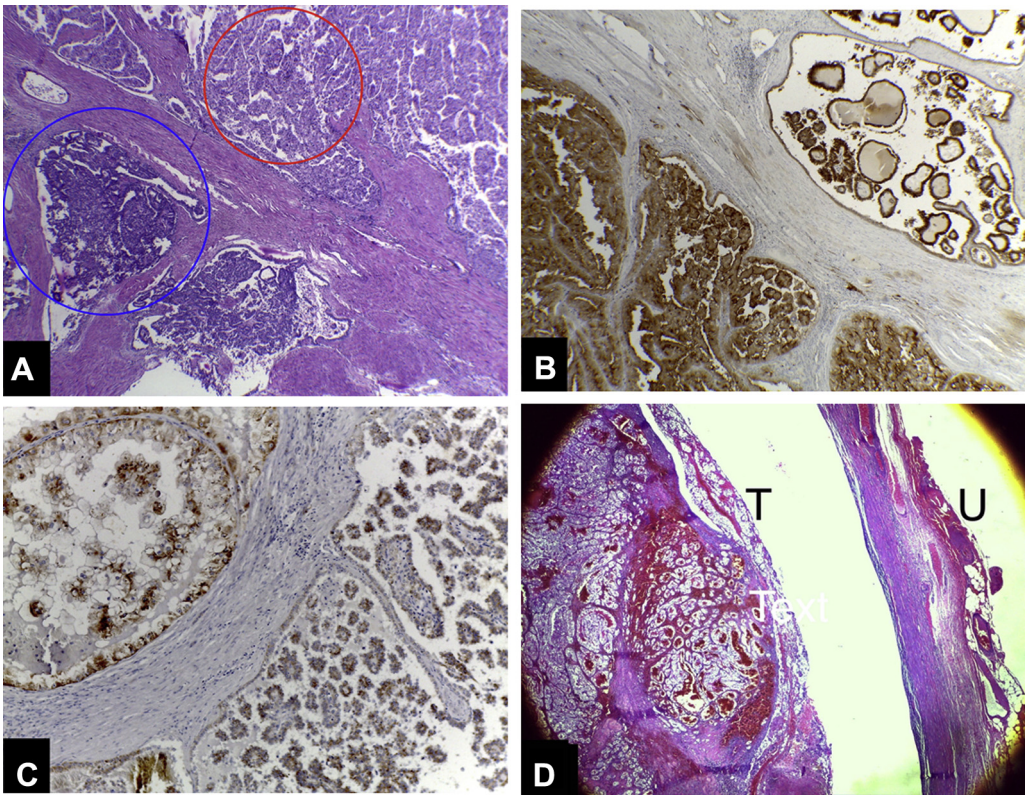

Figure 2. Histologic examination. Two types of tumor found: clear (red circle) and papillary cell (blue circle) (A; HE, x40). On Immunohistochemistry examination CD 10 (B) and AMACR (C) was positive suggesting RCC. Thrombus-like tumor (T) inside the ureteral wall (U) (D; HE, x2,5).

node found to have similar tumor type. No malignancy was observed in the surrounding renal pelvic or ureteral mucosa. To further differentiate these 2 types of tumors, we performed immunohistochemistry examination (Fig. 2B and C).

Follow up Abdominal CT scan with contrast (3 month) reveals no residual tumor mass and lymph node enlargement.

Discussion

This case report presented a patient with thrombus-like tumor of renal cell carcinoma mimicking transitional cell carcinoma of kidney. This presents difficulty in differentiating between RCC and UTUC. The patient underwent an open left nephroureterectomy, bladder cuff excision, and left paraaortocaval lymph node dissection. On CT abdomen, the thrombus mass seems only filled until the middle ureter, however it was found on macroscopic examination that, although it was not dilated, the middle ureter was also filled by the mass, this phenomenon was very unique because the mass followed the ureteral lumen distally instead of invading it. It is recommended to do open radical nephroureterectomy with bladder cuff excision for high-risk UTUC, regardless of tumor location. This operation must comply with oncological principles, which consist of preventing tumor seeding by avoiding entry into the urinary tract during resection.[3]

There are possibility of misinterpreting RCC, if it involved renal pelvic dan ureter, with Transitional cell carcinoma (TCC) just by CT scan findings. First, Both RCC and TCC may show the same enhancement after contrast administration, however, TCC originated from the renal pelvis rather than renal parenchyma seen in RCC. Second, TCC spreads centrifugally, altering the regional architecture of the adjacent renal sinus and renal parenchyma but preserving the renal contour, while RCC tends to distort the renal outline.[4] In this case, the outline distortion of the left renal can be seen originated mainly from the upper pole, this is evident that the mass arise from this side.

To our knowledge, there are only 2 other reported cases of RCC that directly invaded from the renal pelvis into the ureter and formed a thrombus-like tumor. Gulati et al, reported the first case of a tumor thrombus from RCC extending from the kidney down the ureter and into the lumen of the bladder.[5] Fujita et al reported another case of RCC with a tumor thrombus in the whole ureter.[2] The mechanism by which RCC metastasizes to the bladder is controversial, and three theories have been suggested.[5] First, based on cases of metastatic RCC in the ureter and bladder, invasion of distal ureter or bladder occurred because tumor cells can undergo intraluminal transit down the urinary tract. A second theory is that of retrograde venous embolization toward the secondary bladder veins by tumor cells from the kidney. This theory has higher proportion of left-sided RCCs, because there are more abundant pelvic venous communications in the left kidney, resulting in pelvic metastases. Finally, widespread synchronous metastasis was evident in lymphatic spread of tumor cells. Our patient had intraluminal extension of RCC throughout her renal pelvis and down the entire ureter, however did not have microscopic individual tumor implants in the ureter, suggesting that RCC may indeed spread directly along the lumen of the excretory tract, and, like both cases by Gulati and Fujita et al, supports evidence to the first theory mentioned previously.

Involvement of the urinary collecting system by renal cell carcinoma is rare in the absence of other poor prognostic features associated with the primary tumor. Clear cell carcinoma most commonly invades, while invasion by papillary tumors is rare. Due to the rarity of cases involving thrombus-like tumor along the ureter, current staging system does not mentioned the importance

of collecting system, or even ureteral, involvement in the TNM classification.[3] This case has unique pathology of mixed RCC between clear cell and papillary carcinoma, which extends from the collecting system toward the distal ureter without invading adjacent organs or extending outwards from the ureteral wall. No previous literature has ever reported similar condition regarding a patient with RCC.

Conclusion

RCC with isolated extension to the ureter is extremely rare. This study presents a case of RCC invading the collecting system with direct extension down to distal ureter and no presentation outside the capsule, the ureteral wall, and renal vein. This case further support that RCC can directly extend down the excretory tract in the form of thrombus mass. Urinary tract extension in RCC might be important to be incorporated in the TNM staging.

Conflict of interest

There are no conflict of interest.

Acknowledgment

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