Squamous cell carcinoma of the renal pelvis with inferior vena cava and iliac vein tumor thrombus

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Renal cell carcinoma with inferior vena cava (IVC) tumor thrombus is a well described clinical entity. We report a case of 64-year-old man that developed an aggressive renal pelvic squamous cell carcinoma (SCC) with extensive IVC and bilateral iliac vein tumor thrombus. To our knowledge this is the fifth reported case of renal pelvic SCC with IVC tumor thrombus and the first involving the iliac veins. We review the current therapeutic options for treatment of SCC with IVC involvement.

Key Words: squamous cell carcinoma, renal pelvis, inferior vena cava, illiac vein, tumor thrombus

Introduction

Squamous cell carcinoma (SCC) of the renal pelvis is an uncommon urologic malignancy occurring in 6%-15% of all patients with upper urinary tract malignancies.[1] Microscopic vascular invasion is common.[2,3] However, gross renal vein or inferior vena cava (IVC) tumor thrombus is exceedingly rare. We report a case of extensive IVC and bilateral common iliac vein tumor thrombus.

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Case presentation and management

The patient is a 64-year-old Caucasian male who presented with a 3 week history of fatigue and lower back, right hip and leg pain. His pain was sharp, unremitting and radiated across to the mid pelvis and left hip. The patient denied any past medical history and denied any previous episodes of unexplained flank pain. Serum creatinine, calcium, alkaline phosphatase and hematocrit were within normal limits. Physical exam was significant for severe bilateral lower extremity and scrotal edema and a palpable RUQ mass. Computed tomography (CT) of the abdomen and pelvis revealed a large mass in a moderately hydronephrotic right kidney with extensive periaortic lymphadenopathy and tumor thrombus involving

the inferior vena cava and bilateral common femoral, external iliac and common iliac veins, Figure 1. Bone scan or chest CT did not reveal any other evidence of metastatic disease.

After a discussion of conservative and surgical options, the patient elected to undergo surgical resection. An open right radical nephroureterectomy was performed. Unfortunately, a complete resection of the tumor thrombus was not achieved. The IVC was resected from the level of the hepatic veins to just above the left renal vein where it was ligated to prevent any thrombotic events. The vascular surgery consultation did not think a resection was possible below the left renal vein. Gross examination of the resection specimen demonstrated a tumor measuring 14 cm in greatest dimension, involving the perirenal, peripelvic and periuretreral soft tissue which was classified as a pathologic stage T4, Figure 2a. Histologic sections showed a moderately differentiated SCC of the renal pelvis with renal vein and perineural invasion, Figure 2b, 2c. The tumor involved the superior renal, peripelvic and periuretreral soft tissue with angiolymphatic invasion and was classified pathologic stage T4. Postoperatively the patient experienced an increase in his lower extremity and scrotal edema creating difficulty with ambulation. The patient was placed on intravenous furosemide with significant improvement in his lower body edema. In house

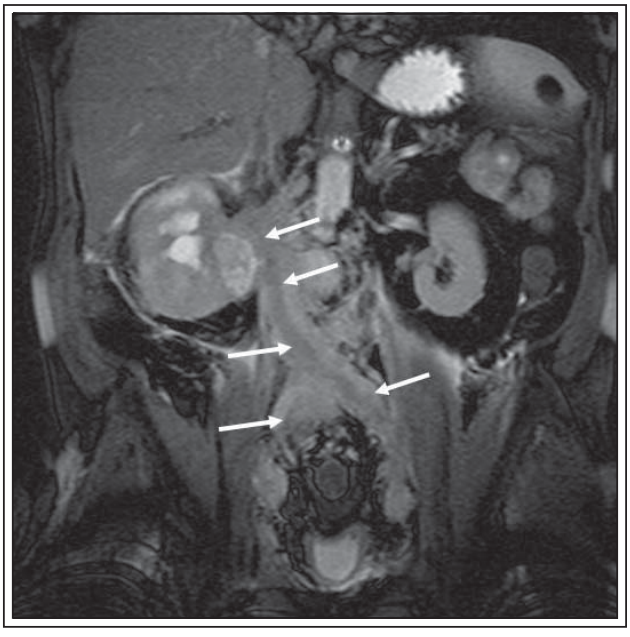

Figure 1. T2 weighted, gadolinium enhanced MRI of abdomen and pelvis revealing right sided renal mass, hydroneophrosis and tumor thrombus extending into the common femoral veins.

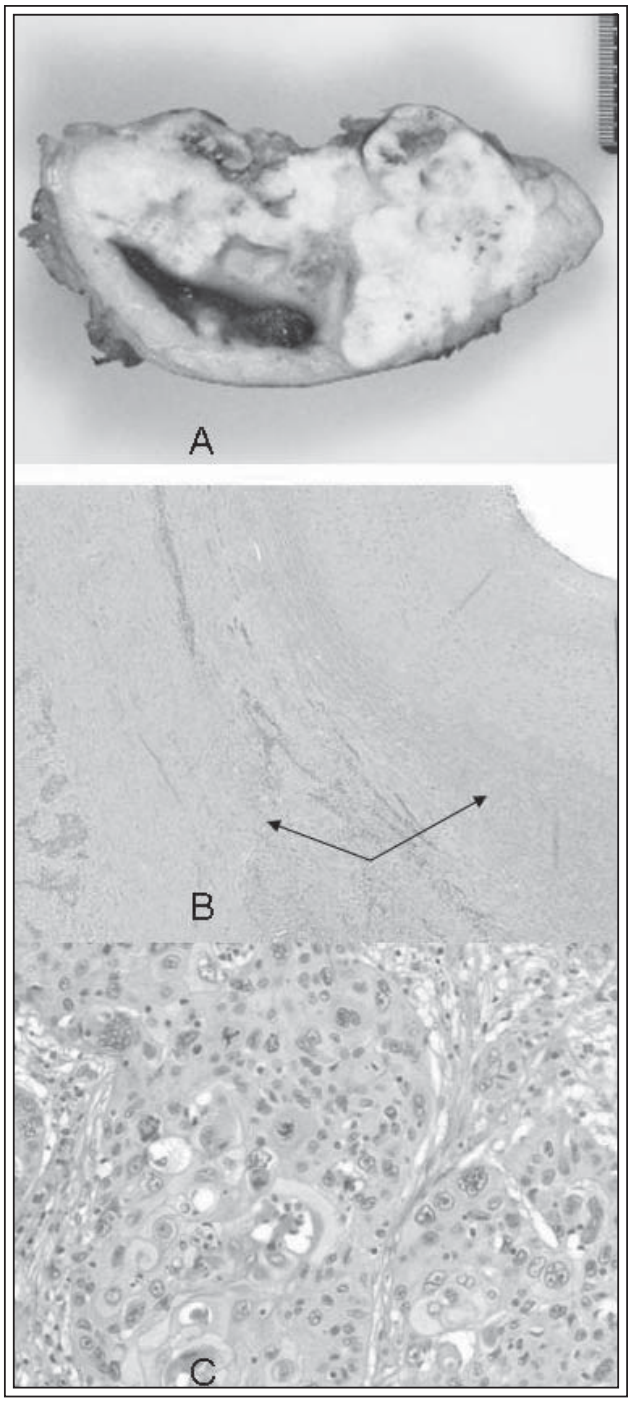

Figure 2. a) The tumor grossly obliterated nearly the entire kidney with extension into the perirenal and peripelvic adipose. b) Cords of tumor were present in the renal vessel wall (arrows). (Hematoxylin-eosin stain, 4X). c) Squamous pearls with keratin formation, diagnostic of squamous cell carcinoma, were seen. The tumor demonstrated marked nuclear pleomorphism and numerous abnormal mitotic figures. (Hematoxylin-eosin stain, 20X).

physical therapy and rehabilitation medicine teams were consulted. Over the course of 2 weeks, his preoperative level of functioning was achieved. The patient was discharged home on oral warfarin to limit progression of venous thrombosis.

Discussion

Squamous cell carcinoma of the renal pelvis is a rare urologic malignancy. Renal cell carcinoma occurs six times more frequently than renal pelvic and ureteral lesions, of which, only 6% to 15% are squamous cell carcinoma.[1] It is postulated that squamous change of the urothelium in response to chronic irritation by foreign bodies such as stones or stents with subsequent malignant degeneration is the pathophysiologic origin of these malignancies.[2] Classically, SCC occurs in patients with a history of nephrolithiasis, staghorn calculi or chronic inflammation.[1] Common CT findings include a renal mass, hydronephrosis and calcifications. However, since these are nonspecific findings often associated with other urologic malignancies such as TCC, diagnosis is often established histologically. At presentation, advanced disease (≥ T3) occurs in 94% with metastatic spread occurring early in the natural history.[1] The reported 5 year survival rate is 7.7%.[1]

Vascular invasion from renal cell carcinoma is a well described, commonly seen clinical entity occurring in 10% of cases.[4] However, only 16 cases of IVC thrombus secondary to urothelial carcinoma of the renal pelvis have been reported.[5] To our knowledge in the published literature, IVC extension in SCC of the renal pelvis has occurred only four times previously.[1,6-8] In a recently published series of 42 patients with SCC of the renal pelvis, only one patient (2.3%) had IVC tumor thrombus.[1]

Of the four reported cases of SCC with IVC involvement, detailed case reports are published on three patients. Two patients were diagnosed by percutaneous biopsy due to advanced stage. One of these patients had metastatic disease at presentation and received primary chemotherapy with cisplatinum, bleomycin and etoposide, but died 6 months after presentation. Autopsy confirmed pure SCC. The other patient refused further treatment and the outcome was unpublished. Since the diagnosis was made by percutaneous biopsy, the tumor histology may not have been pure SCC but rather UC with squamous differentiation. In the third published case, the patient underwent radical nephrectomy with en bloc lymphadenectomy and complete IVC resection. The patient developed a local recurrence but data was not published on further therapy or outcome.

In this case, the patient continues to have lower back discomfort but complains of less fatigue at last follow up (3 months). His lower extremity edema completely resolved. A CT scan of the chest, abdomen and pelvis, showed new lower mediastinal, retrocrural, and right external iliac lymphadenopathy, lytic lesions in the left iliac bone and inferior left scapula and continued extensive retroperitoneal necrotic lymphadenopathy representing interval progression of disease. The patient will start a course of adjuvant chemotherapy using carboplatin, paclitaxel and gemcitabine.

In patients with locally advanced upper tract TCC, surgical resection with adjuvant cisplatinum based chemotherapy has shown survival benefit in retrospective review,[9] but never in randomized controlled trials due to the rare nature of these lesions. In patients with metastatic upper tract TCC, systemic chemotherapy regimens similar to TCC of the bladder are used. Complete response is rare and data is limited. Current regimens being investigated include carboplatin, paclitaxel, ifosfamide and gemcitabine. Given the extreme rarity of locally advanced and metastatic SCC of the upper urinary tract, data on adjuvant chemotherapy or cytoreduction is based on case reports only. Our adjuvant treatment regimen was chosen based on data that platinum and taxol based chemotherapy regimens show activity in SCC of the cervix and head and neck.[9,10]

Conclusions

This is the fifth reported case of SCC of the renal pelvis with IVC metastasis and the first reported case with iliac vein tumor thrombus. This patient is the first treated with cytoreductive nephrectomy with subsequent adjuvant chemotherapy. Survival, when reported, is poor in this cohort. Data on adjuvant therapy or the role for cytoreductive techniques for these lesions are not available. In the absence of diffuse metastatic disease in symptomatic patients, we advocate complete resection, when possible, for both palliation and a chance at prolonged survival. We also recommend a trial of adjuvant chemotherapy once the patient recovers from surgery. □

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