Wrist Drop: An Atypical Presentation of Renal Cell Carcinoma

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Abstract: Renal cell carcinoma (RCC) causing metastasis to the skeletal muscles is extremely rare. The authors describe a patient with history of RCC treated 5 years ago with radical nephrectomy who presented with left arm swelling after receiving seasonal flu shot. He was initially diagnosed with cellulitis, treated with intravenous antibiotics and discharged home. One month later, he presented with persistent left arm swelling accompanied by wrist drop. Subsequently he developed increased swelling, decreased pulse and wrist drop. He was diagnosed with compartment syndrome, for which fasciotomy was performed, and tissue samples were sent for analysis. Histopathological analysis confirmed metastatic clear cell RCC. The authors described a literature review of previously described cases of metastasis of renal cell cancer to the skeletal muscles. The authors also discussed the rarity of muscle metastasis and unpredictable behavior of RCC after being dormant for long periods.

Key Indexing Terms: Renal cell carcinoma; Metastatic renal cell carcinoma; Atypical presentation of renal cell carcinoma. **[Am J Med Sci 2011;342(2):170–173.]**

Metastasis to the skeletal muscles is a rare phenomenon. Most common primary tumors causing metastasis to the skeletal muscles are breast, colon, lung and pancreas. On the other hand, renal cell carcinoma (RCC) does not usually metastasize to the skeletal muscles. Common sites for metastasis of the RCC are lungs, lymph nodes, bones and liver. Few cases of metastasis of RCC to the skeletal muscles have been described in the literature. In a large autopsy series, only 0.4% of patients with RCC had skeletal metastases.[1]

In terms of treatment, different modalities are available for localized and advanced RCC. In the absence of distant metastases, nephrectomy is considered a curative treatment. After nephrectomy for localized disease, relapse rate is 1.8% to 27%[2]; however, relapse in the form of distant metastases is rare.

We describe an unusual case of a patient who presented to the emergency department with left arm swelling. On further testing, he was found to have metastatic renal cell cancer.

CASE DESCRIPTION

A 74-year-old man presented to emergency room with left arm swelling, pain and numbness for the last 1 month. His medical history was significant for renal cell cancer, which was diagnosed 5 years ago. Appropriate staging was performed at that time which was T2N0M0. Because of absence of disseminated disease, nephrectomy was recommended. Patient underwent left sided nephrectomy and was discharged home.

Two months before current admission, patient received a flu shot in left upper arm and developed left arm swelling, pain and erythema. He was admitted to hospital and treated for cellulitis for 2 days, and then he was discharged home on oral antibiotics. He improved temporarily and then presented again 1 month after discharge (current admission) with similar complaints. On physical examination, patient had severe edema involving the entire left upper extremity extending from shoulder to the finger tips. There was oozing of serous fluid without any open wounds along with an area of bluish discoloration in left upper arm. On palpation, he had an area of induration on the anterior aspect of left upper arm and palpable left axillary lymph nodes. On vascular examination, distal radial pulses were present. On neurologic examination, he had decreased sensation of the left arm along with complete wrist drop and inability to perform hand grip.

Initial laboratory studies showed serum creatinine of 1.63 mg/dL, creatinine kinase 236 units/L, leukocytes count of 13.2 k/μL, hemoglobin of 11.9 g/dL and platelets count of 55 k/μL. Ultrasound of left upper extremity failed to reveal deep venous thrombosis but did show a large hematoma measuring 13.8 $\times$ 7 cm (Figure 1).

An initial diagnosis of compartment syndrome with wrist drop was made. Patient was taken to the operating room immediately. He underwent open fasciotomy with incision and drainage. A total of 200 mL of serous fluid was drained, and no pockets of abscess or hematoma were found. Histopathological and microbiological specimens from biceps muscle were obtained. Results showed metastatic RCC in the left upper arm of clear cell type (Figure 2). Patient also undergone radiological imaging including computed tomography scan of abdomen that was consistent with developing metastatic lesions in liver.

DISCUSSION

Our case describes an unusual presentation of metastatic RCC to the left biceps muscle many years after resection of the primary tumor.

RCC has an extremely unpredictable clinical course. Usual sites of metastasis are lungs (29%–50%), bones (16%–31%), liver (8%–30%), brain (2%–10%) and local recurrence(<2%). Late recurrence is unusual for RCC; however, metastasis to almost all body systems has been reported.

The greatest risk of recurrence for RCC occurs within the first 5 years after nephrectomy, with the majority of recurrences occurring within 3 years. Because of unpredictable nature of RCC, extensive surveillance protocols have been developed.

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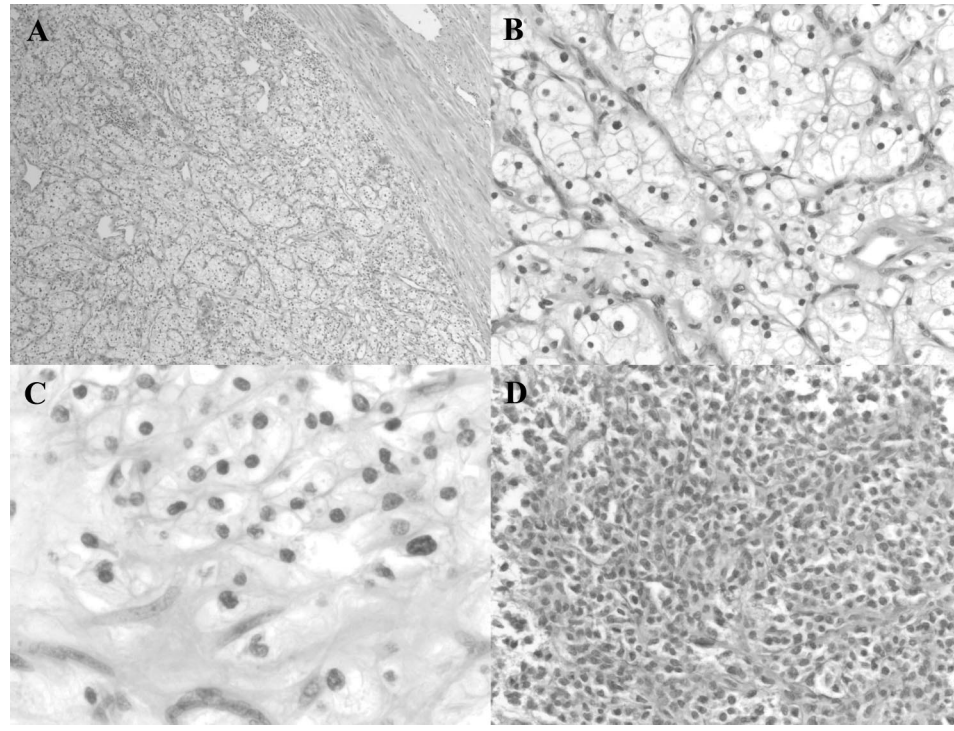

FIGURE 1. (Panel A) 40× microscopic image showing well circumscribed, clear cells. (Panel B) 200× microscopic image showing typical clear cell cancer with clear cytoplasm and fine background vasculature of renal cell carcinoma. (Panel C) 400× microscopic image showing mild nuclear pleomorphism. (Panel D) Microscopic image showing fine vascular pattern in background. Hypercellular when compared with kidney with vaguely appearing clear cytoplasm.

There are many mechanisms to explain why metastasis to the skeletal muscles is rare. Increased concentration of protease inhibitors in the extracellular matrix may act as a barrier to tumor cells invasion. Increased acidic environment offers significant resistance to tumor growth, and muscular contractions play an important role in dislodging anchored tumor cells.

We also performed a literature review of prior cases describing metastasis of the RCC to skeletal muscles (Table 1).

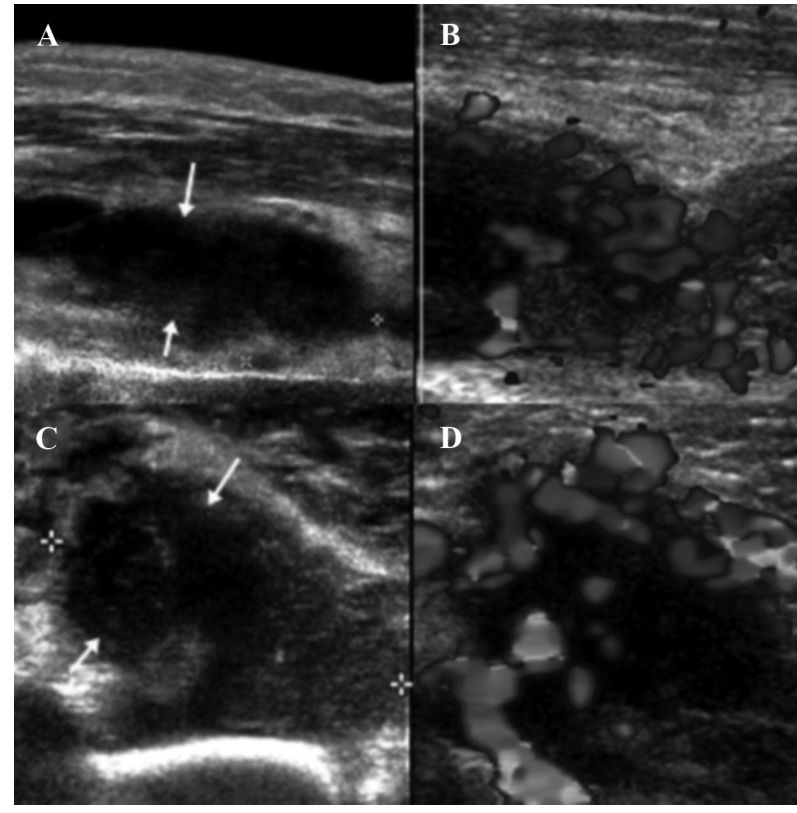

FIGURE 2. (A) Ultrasound of the left arm (longitudinal section) showing a hypoechoic area suggesting hematoma (arrows), (B) color Doppler (longitudinal section), (C) ultrasound (crosssection) and (D) color Doppler (crosssection). After evacuation, this turned out to be metastasis of renal cell carcinoma.