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Case Report

Metastatic renal cell carcinoma presenting as subcutaneous nodule☆

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ABSTRACT

Renal cell carcinoma is frequently undiagnosed until it reaches an advanced metastatic stage. Renal cell cancers are also seen as incidental findings on imaging, and rarely can present as physical examination findings. We report a rare case where metastatic renal cell carcinoma presented as a solitary 2 cm subcutaneous chest wall nodule in an otherwise asymptomatic male patient. Initial ultrasound evaluation showed a solid vascular subcutaneous mass, a fine needle aspiration suggested metastatic renal cell cancer, and later, excision biopsy, and CT scan of the abdomen made the final diagnosis of stage IV renal cell carcinoma. The differential diagnosis of a 2 cm nodule can be broad and in appropriate clinical setting should include consideration of malignancy and/ metastasis.

Introduction

Renal cell carcinoma (RCC) is the most common form of renal malignancy, accounting for 80%-90% of all malignant kidney tumors. It predominantly affects African American males in their 6th-8th decades of life [1,2]. There is also a 20% increased risk of RCC in smokers with a 20+ pack year tobacco-use history [2]. This cancer is known for being asymptomatic during early stages; however, some presenting symptoms of RCC are hematuria, abdominal pain, and a palpable flank mass [3]. RCC is also diagnosed by manifestations of metastases to distant sites, such as the lungs, liver, lymph nodes, and adrenal glands. A less common site of RCC metastasis is the skin, seen in 1%-3.3% of cases, and is usually a later manifestation of the disease [4,5]. We present a unique case of a 65-year-old African American male who presented with a subcutaneous 2 cm chest wall nodule in an outpatient clinic. Biopsy of the skin nodule revealed that patient has metastatic RCC. In this case report, we discuss the unique clinical presentation, diagnostic findings, and therapeutic management.

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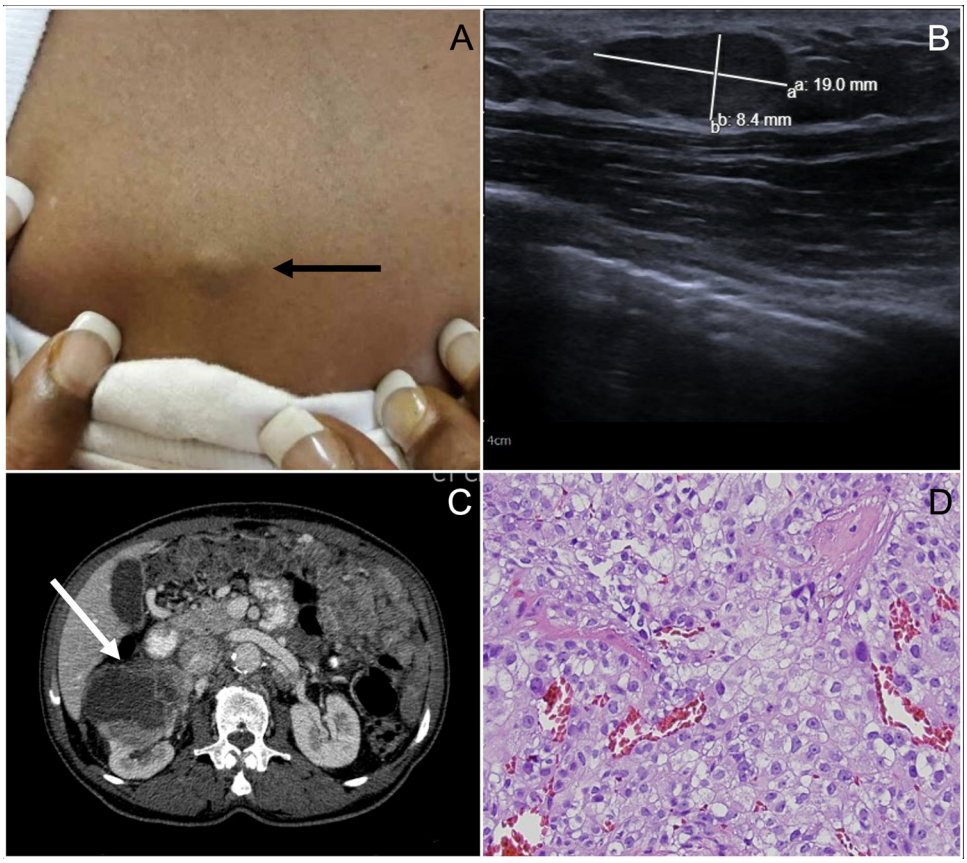

Fig. 1 – Panel A shows patient's photograph with a left chest wall nodule (black arrow). Panel B shows the subcutaneous solid and vascular lesion which was later biopsied and then excised. An axial image from patient's CT scan of the Abdomen, using intravenous contrast, shows a large complex cystic and enhancing mass arising from the superior pole of the right kidney. Histopathology from the excision biopsy (panel D) shows solid sheets of cells with clear to vacuolated cytoplasm and macronucleoli. The delicate microvasculature is typical of clear cell renal cell carcinoma (H&E 20x).

Case report

A 65-year-old African American male with unremarkable past medical history came to the outpatient family medicine clinic for evaluation of a skin nodule in the left chest wall. The palpable nodule initially appeared about 6 months ago and was slowly growing. Patient did not have nodules on other parts of his body. Patient is a smoker and does not drink alcohol. His family history is unremarkable. On examination, a 2 cm x 2 cm subcutaneous nodule was palpated in the left chest wall. The nodule was mobile, non-tender, soft but rubbery on palpation, and non-pulsatile (Fig. 1A). His skin exam was normal on other parts of his body.

Patient had a normal complete blood count and metabolic panel. Clinically, a lipoma was suspected, and ultrasound of the nodule was obtained. This showed a 1.9 × 0.8 cm oval solid, well circumscribed, and vascular subcutaneous nodule (Fig. 1B). Later, an FNA was obtained, and the aspirated tissue revealed abundant malignant epithelial cells arranged in loosely cohesive groups and clusters. The cells had abundant multivacuolated cytoplasm with enlarged eccentrically placed nuclei and prominent nucleoli. The cytology features were suggestive of renal cell origin so a confirmatory immunohistochemical panel was performed. The tumor cells were positive for Ca IX, CD10 and RCC, all consistent with renal cell carcinoma. Immunohistochemical markers for melanoma (Sox10), germ cell tumors (PLAP), breast tumors (GCDFP-15, CK7) and vascular tumors (CD31) were all negative. It was decided to proceed with excisional biopsy and CT scan of his abdomen. The excisional biopsy confirmed metastatic renal cell carcinoma (Fig. 1D). The CT scan of abdomen and pelvis showed a complex cystic right renal mass of 7.8 cm x 9.0 cm (Fig. 1C), with enhancing solid peripheral nodularity, and invasion of the adjacent liver. There was evidence of metastatic retroperitoneal paraaortic lymphadenopathy and a right adrenal nodule.

It was concluded that patient had stage IV metastatic renal cell carcinoma and that the renal mass was unresectable. Patient was then referred to the oncologist for chemotherapy. After starting chemotherapy, his skin nodule became smaller, but the renal mass remained unchanged. Unfortunately, patient's disease progressed, and he developed other subcutaneous skin nodules, innumerable mesenteric nodules, peritoneal carcinomatosis, retrocrural and retroperitoneal lymphadenopathy, and lungs metastases. His treatment was

accordingly changed to palliative chemotherapy. Patient is still alive, at the time of writing of this manuscript, about 14 months since his initial presentation with subcutaneous nodule.

Discussion

The classic clinical triad of renal mass is flank pain, hematuria, and a palpable mass. However, the classic triad is very uncommon, and may not appear until advance stage [6]. Other symptoms are weight loss, recurrent fever, hypertension, hypercalcemia, and distant metastasis [7]. On average, about 25% RCC are metastatic, and it typically hematogenously metastasizes to distant sites such as the lungs, lymph nodes, and bone [8,9]. A very rare metastasis presentation site of RCC is the skin, making up 1%-3.3% of cases [4,5]. Based on the literature, the most usual locations of skin metastasis are scalp, and face. The skin metastatic lesions grow rapidly, and some may be pulsatile [10]. Skin metastases of RCC are often missed or overlooked because of the low suspicion. The lesions typically imitate other common dermatologic disorders, such as angioma, basal cell carcinoma, cutaneous horn, lipoma, xanthoma, sebaceous epitheliomas and adenomas, clear cell hydro adenomas and other skin pathologies characterized by the presence of clear cells [11]. For anatomic location and hematogenous spread, RCC subcutaneous metastasis to the chest wall is even more rare.

Renal cell carcinomas are malignant adenocarcinomas originally derived from the renal tubular epithelium that vary in appearance from solid homogeneous masses to heterogeneous with areas of cystic change, necrosis, and hemorrhage [12]. Ultrasound can used for initial evaluation as it is cheaper and does not expose patients to radiation. However, for tumor staging and surgical planning, a CT scan or MRI of abdomen and pelvis is required. RCC has a varying appearance on sonograph and may appear solid or partially cystic. Although most RCCs are hypoechoic on US, they can also present as hyper- or isoechoic. A study showed that contrast-induced ultrasound has higher diagnostic efficacy than conventional ultrasound for differentiating RCC and angiolipoma [13]. Immunohistochemistry helps narrow the differential diagnoses of these skin lesions: EMA, CEA, CD-10, and RCC-MA (positive in 60% of all RCC skin lesions) are all markers that suggest skin metastases of renal origin [9].

Treatments for RCC vary, based on the staging, and grading of the disease. In most cases, metastatic RCC therapy includes surgical (radical nephrectomy) treatment and combinations of immune checkpoint inhibitors and/or anti-angiogenic tyrosine kinase inhibitors (TKIs) [14]. RCC is typically resistant to radiation and cytotoxic chemotherapy [15]. Metastatic skin lesions are usually surgically removed in most cases. The first 5 years after radical nephrectomy have the greatest risk of RCC recurrence, with majority recurring in the first 3 years [16]. Within the first year of remission of RCC, 43% of cases will recur [16].

In 80%-90% of cases, the skin lesion is not related to the primary tumor of RCC, and presents as a cancer recurrence 6 months to 5 years after nephrectomy [4]. Besides skin metastasis, renal cell cancer can also be found in calvarial bone several years after nephrectomy [3]. Since skin metastases are usually considered to be a late manifestation of this disease, they bear a poor overall prognosis that correlates with other visceral metastases. Life span after diagnosis of skin metastases in this type of presentation is 6 months or less [17]. Since our patient was diagnosed at the beginning with skin metastasis, they were able to start chemotherapy soon after. Our patient is still alive since his fist skin metastasis was diagnosed, about 14 months ago.

Conclusion

The differential diagnosis of a 2 cm subcutaneous nodule is very broad. If clinical suspicion for a neoplastic process or metastatic disease is high, it is important to evaluate the skin lesion further with ultrasound, and ultrasound guided FNA to confirm the diagnosis. If renal cell skin metastasis is confirmed, prompt evaluation is required by multi-disciplinary specialties, such as urology, interventional radiologist, medical and surgical oncologist, to formulate the treatment plan.

Authorship

The authors declare that this is their original work and they all approve the content of this manuscript. They confirm that this manuscript has not been published previously, in any language, in whole or in part, and is not currently under consideration elsewhere.

Ethical clearance

This project did not involve any research and no ethical clearance was required.

Patient consent

A written informed consent was obtained from the patient for the publication of this case report.

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