Renal Cell Carcinoma Diagnosed by Cutaneous Metastasis: A Case Report

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Renal cell carcinoma (RCC) is one of the most frequent malignancies of the genitourinary tract and has the poorest prognosis of all urologic tumors. It often causes metastatic lesions, and although rare, the skin also can be involved. Cutaneous lesions rarely are the primary signs of RCC. We report a case of RCC with solitary nodular cutaneous metastasis on the right forearm that was seen before the primary tumor was diagnosed; there was no other organ involvement.

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Renal cell carcinoma (RCC) accounts for 90% of all renal tumors and has a poor prognosis.[1] Approximately one-third of patients with RCC present with metastasis at the time of diagnosis, and 30% of the cases treated with nephrectomy could potentially relapse during the course of the disease.[2] The most common sites of metastatic lesions for RCC are the lungs, bone, liver, gastrointestinal tract lymph nodes, contralateral kidney, and brain. The skin is a less frequent location of metastasis and usually is involved in the late stage of disseminated disease. Few cases discuss cutaneous metastasis as the first manifestation of an occult and asymptomatic RCC.[3,4] We report a 73-year-old man with a nodular ulcerative lesion on his right forearm from a primary manifestation of a silent RCC with no other localization.

Case Report

A 73-year-old man was referred to the dermatology department with a nodular lesion on his right forearm of 5 years' duration. The lesion had increased in size in the last year and had become ulcerated. Cutaneous examination showed a blackish brown, bleeding, exophytic, nodular lesion that measured 2.3 cm in diameter with a base of approximately 3 cm (Figure 1). The lesion was ulcerated at the surface and was tough and thick on palpation. His medical history included systemic hypertension, ischemic cerebrovascular disease, diabetes mellitus, and internal carotid artery stenosis. He was unremarkable for other symptoms, and hematologic examinations performed during the time of his admission were within reference range.

An excision biopsy was performed and the cytologic features of the tumor cells were consistent with RCC. The typical cells (clear cells) with sharply demarcated cytoplasm and almost centrally located nuclei were clearly visible (Figures 2 and 3). Immunohistochemistry was positive for CD10 (Figure 4A), vimentin (Figure 4B), and cytokeratin. Whole body computed tomography was performed to prove the presence of a renal malignancy and possible visceral metastatic lesions. A nonhomogeneous, irregular, solid mass measuring approximately 6 cm in diameter was found in the inferior pole of the left kidney with involvement of perivisceral adipose tissue and the surrounding muscular area, but no metastases were found in other organs.

For correct staging of the disease, cranial magnetic resonance imaging and bone scintigraphy also were performed. Cranial magnetic resonance imaging did not show evidence of an atypical lesion, except for the previously documented ischemic alterations; however, bone scintigraphy documented hyperfixation in the T12 transverse process of unknown origin.

The patient was referred to the urology department and underwent a left radical nephrectomy. Histology of the left kidney confirmed the diagnosis of a 5-cm RCC (Fuhrman grade 2) confined to the

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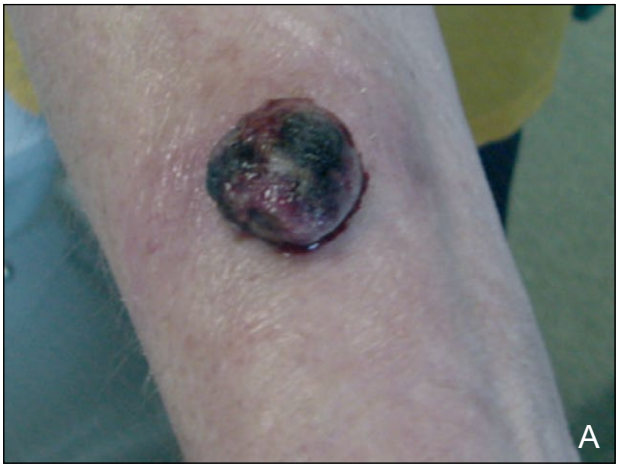

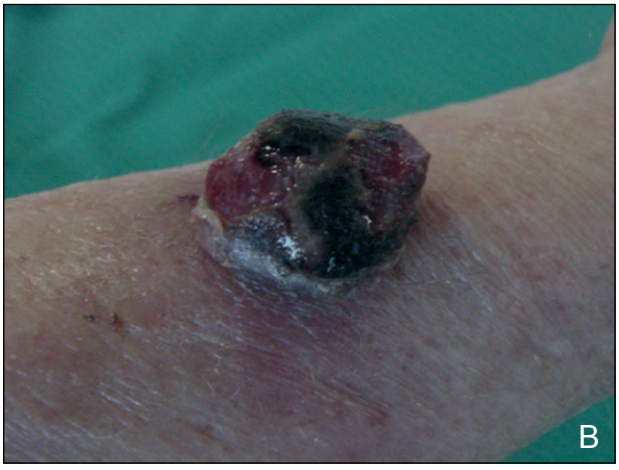

Figure 1. A blackish brown, bleeding, exophytic, nodular lesion that measured 2.3 cm in diameter (A) with a base of approximately 3 cm (B). The lesion was ulcerated at the surface and was tough and thick on palpation.

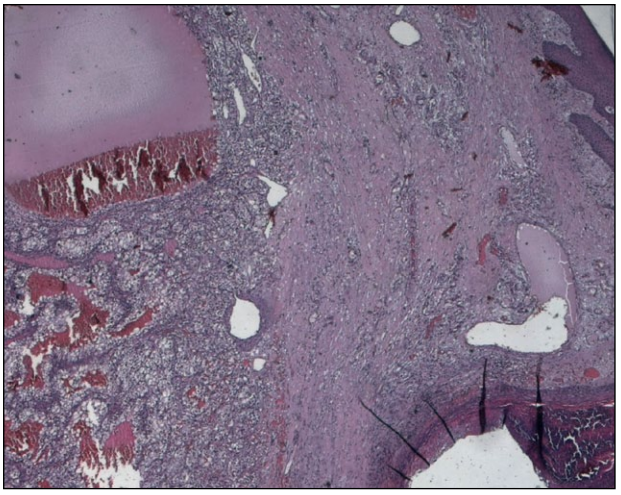

Figure 2. Histology revealed a neoplasm in the lower part of the dermis. The tumor had a distinct border and showed no connection to the epidermis (H&E, original magnification ×2.5).

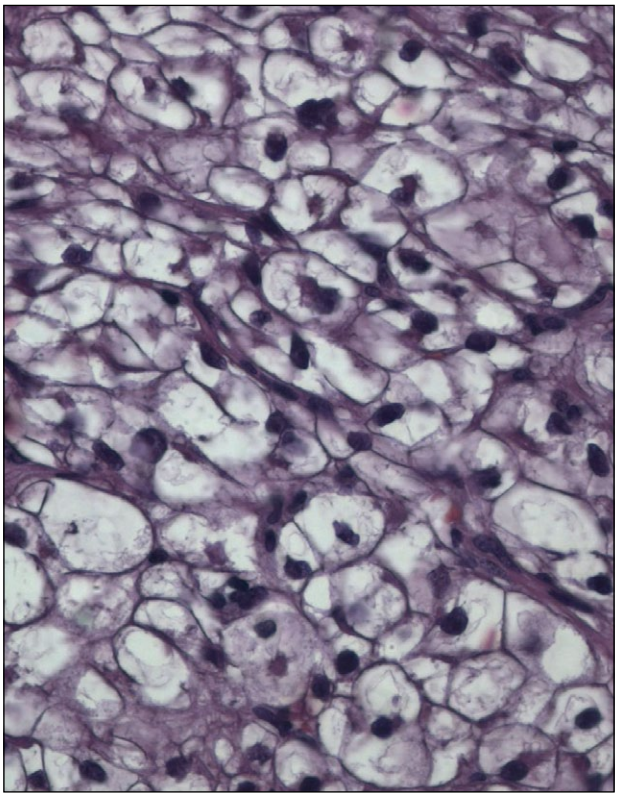

Figure 3. The cytologic features of the tumor cells were consistent with a renal cell carcinoma. There was a sharp outline of cytoplasm and almost centrally located nuclei (H&E, original magnification ×40).

kidney (pT1b pNX pMX). The patient died 2 days after surgery from postoperative complications.

Comment

Cutaneous metastasis of solid primary tumors is rare, with an incidence ranging from 0.3% to 9%. In women, cutaneous metastases are more common with breast cancer, followed by colon, lung, and ovarian cancer; in men, cutaneous metastases are most common with lung cancer, followed by colon, head, and neck cancer.[5]

Cutaneous metastases from urologic tumors are uncommon and occur in 1% of cases. Moreover, their clinical appearance may mimic other frequent dermatologic disorders, thereby affecting patients with advanced malignancies. Brownstein and Helwig[6] described 3 clinical features of these lesions: a nodular type, an inflammatory type, and a fibrotic (cicatricial) or sclerodermoid type. Cutaneous lesions most frequently are multiple and disseminated, but they also may present as solitary metastases. Clinically, they usually appear as a plaque or nodular lesion, range

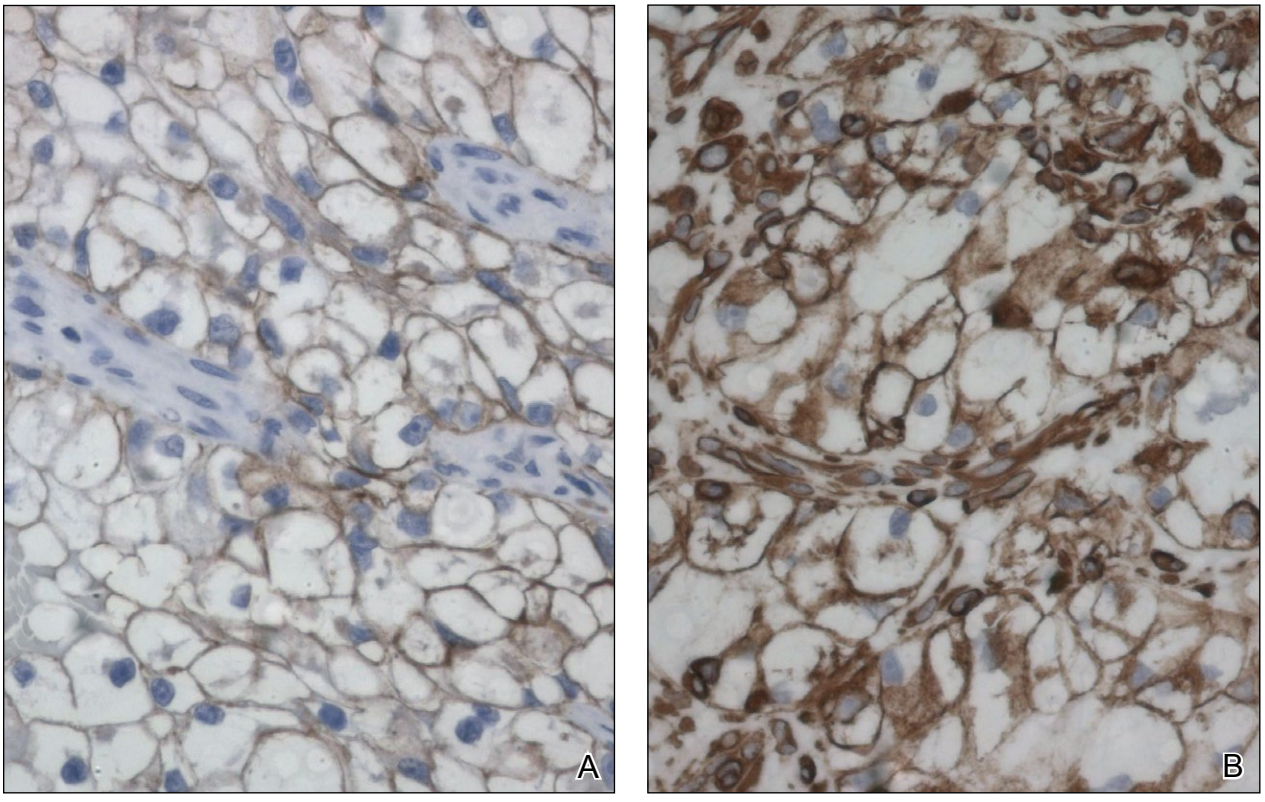

Figure 4. Immunohistochemistry was positive for CD10 (A)(original magnification ×40) and vimentin (B)(original magnification ×40).

from several millimeters to many centimeters, grow rapidly, and are bluish red in color and sometimes pulsating. The lesions most frequently are found on the trunk, scalp and face, abdomen, suprapubic region, and extremities; however, they can affect any part of the body.[7,8]

The clinical differential diagnosis of RCC macroscopically includes angiomas, cutaneous horns, and basal cell carcinomas. Microscopically, histologic differentiation from sebaceous, sweat gland, and vascular tumors, as well as from balloon cell melanoma, can be difficult.[9] In these cases, immunohistochemistry is a fundamental diagnostic tool. Vimentin, epithelial membrane antigen, carcinoembryonic antigen, and CD10 are the main cell markers of RCC.[1]

Renal cell carcinoma represents approximately 90% of all renal tumors.[10] The malignancy usually occurs in individuals aged 30 to 60 years and has the poorest prognosis due to its typically silent clinical behavior. Histologic features of the tumor cells include cords, papillae, tubules or nests that are atypical, polygonal, and large. Additionally, the cells that make up RCC may be clear, granular, mixed clear and granular or sarcomatoid or spindle type. The type of cancerous cells and the aggressiveness of the condition are closely related. Because these cells accumulate glycogen and lipids, their cytoplasm appears clear, nuclei remain in the middle of the cells, and cellular membrane is evident. Some cells may be smaller with eosinophilic cytoplasm, resembling normal tubular cells. The stroma is reduced but well-vascularized.[10]

In approximately one-third of cases of RCC, metastasis is present at the time of diagnosis, and the sites most commonly involved are the lungs, lymphatic ganglia, bone, liver, contralateral kidney, ipsilateral adrenal gland, and brain.[1] The skin is a less affected site of metastasis. The metastases usually are metachronous and appear from a few months to several years following nephrectomy (approximately 47 months); however, the lesions sometimes can be synchronous with the diagnosis of RCC.[3] Cutaneous metastases mainly involve the dermis with occasional extension into the subcutis.[9] Histologically, cutaneous metastases are similar to the primary lesion; however, sometimes they can be poorly differentiated and anaplastic.[7] A new cell marker relatively specific for cutaneous metastases of RCC has been discovered and is called RCC-Ma. It is a monoclonal antibody against a normal renal proximal tubule antigen.[11] The antibody is not widely available for immunohistochemical staining, which limits its use.[9]

In our patient, the diagnosis of RCC was made by histopathology following excision of the only metastatic lesion on his right forearm. Thus the primary RCC was discovered after the initial presence of the metastatic lesion. According to a PubMed search of cases of nonrecurrent RCC presenting with cutaneous metastases using the search terms *cutaneous metastasis* and *renal cell carcinoma*, 2 cases involved the extremities. The first case involved a 72-year-old woman with a solitary lesion on her left lower leg,[4] and the second case report involved a 69-year-old man with metastasis in his left fifth toe.[12] Another case of nonrecurrent RCC presenting as skin metastasis with the absence of additional organ involvement has been reported.[13] Our case poses the following questions: How is it possible that an internal malignancy can generate only a single cutaneous metastasis without any other visceral metastatic lesions? Is the cutaneous metastasis of diffuse, lymphatic, or hematogenous origin? Why did a low-grade RCC develop as a cutaneous metastasis, which frequently is indicative of an aggressive malignancy and a poor prognosis? The paucity of data has resulted in a lack of information on the exact prognosis and treatment of this condition.

Conclusion

Metastatic malignancies, including RCC, should be included in the differential diagnosis of a singular nodular cutaneous lesion. Clinicians and histopathologists should be aware of the possibility of RCC and should conduct a careful cutaneous examination in neoplastic patients and healthy individuals who present with this type of skin lesion.

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