

Metastatic Calcaneal Lesion Associated with Uterine Carcinosarcoma

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ABSTRACT

Metastatic lesions of uterine carcinosarcoma most commonly occur in the abdomen and lungs and less frequently in highly vascularized bone. We report a rare case of an 86-year-old female with uterine carcinosarcoma with metastasis to the left calcaneus. The patient had a history of uterine carcinosarcoma with hysterectomy and bilateral salpingo-oophorectomy, along with bilateral pelvic and aortic lymphadenectomy, with no adjuvant therapy. The initial pedal complaint was that of left foot pain. The initial radiographic findings were negative; however, magnetic resonance imaging scans revealed a substantial area of marrow edema in the calcaneus. An excisional biopsy was performed, and histopathologic analysis revealed adenocarcinoma with features consistent with the patient's previous uterine tumor specimen. The patient was given one treatment of chemotherapy and was discharged to a hospice, where she died of her disease 2 weeks later.

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Uterine carcinosarcoma, also known as malignant mixed müllerian tumor, is a rare, highly aggressive, biphasic tumor composed of epithelial and mesenchymal elements arising from a single malignant clone (1,2). This type of neoplasm represents less than 5% of all uterine tumors and tends to occur in postmenopausal women (2,3). The prognosis for uterine carcinosarcoma is poor, with an overall 5-year survival rate of 30% to 40% (4). High rates of local and distant metastasis have been documented, with the most frequent sites of recurrence to the abdomen and lungs (4). To the best of our knowledge, no reports of metastatic lesions in any of the bones in the foot have been previously published. The purpose of the present report was to describe a rare case of metastatic uterine carcinosarcoma to the calcaneus in an 86-year-old female.

Case Report

An 86-year-old female patient presented to our emergency department (ED) with a chief complaint of left heel and left lower extremity pain. She had a history of stage IA carcinosarcoma of the uterus and had undergone hysterectomy, bilateral salpingo-

oophorectomy, and bilateral pelvic and aortic lymphadenectomy 3 months previously, with no adjuvant therapy. At that time, no metastatic lesions were found in any of the 16 local regional lymph nodes that had been removed. The patient stated that the pain had been present since the procedure and had worsened during the previous 3 weeks. She described the pain as a constant, severe, burning pain localized to the left heel that increased in intensity with weightbearing. She denied back pain, pain radiating down the back of her left leg, and trauma or injury to the leg.

Before presenting to our ED, the patient had been diagnosed by her primary care physician as having Achilles tendonitis and had been prescribed hydrocodone and acetaminophen for the pain. She had also previously sought an outside podiatric opinion and was told that the pain was likely related to a nerve, and she was further referred to a neurologist. The patient came to our ED before her scheduled neurology appointment because of the unbearable pain. She was admitted to the hospital, and a podiatric surgery consultation was requested to further evaluate her painful extremity.

The initial diagnostic testing obtained at the ED visit included thoracolumbar spine radiographs that showed L3-L4 degenerative facet arthropathy and mild to moderate lumbar neural frontal narrowing. The blood test results included a D-dimer of 6423 ng/mL, brain natriuretic peptide of 135 pg/mL, international normalized ratio of 4.9 seconds, erythrocyte sedimentation rate 11 mm/hr, white blood cell count 6.1×10^3 , and a hematocrit of 34%. A review of her medical history revealed stage 1A carcinosarcoma of the uterus, coronary artery disease, hyperlipidemia, hypothyroidism, and hypertension.

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Conflict of Interest: None reported.

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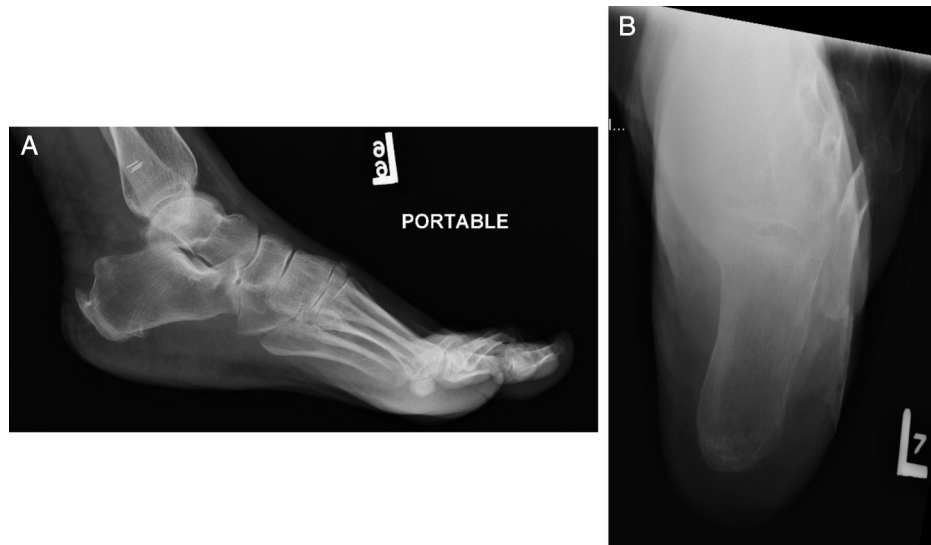


Fig. 1. Preoperative plain radiographs of left foot and ankle. Cortical margins of the calcaneus appear sharp with minimal obvious periosteal reaction. (A) Lateral view. (B) Calcaneal axial view.

She had a history of breast cancer 30 years previously, for which she had undergone surgery without adjuvant chemotherapy, radiotherapy, or hormonal therapy. She also had recently been diagnosed and treated for deep vein thrombosis in her right leg.

The physical examination revealed intense pain in response to palpation of the distal aspect of the left Achilles tendon at the insertion of the calcaneus. Pain was also elicited with lateral squeezing of the left calcaneus and the calf muscle proximally. A significant amount of erythema or edema was not present. The dorsalis pedis and posterior tibialis pulses were palpable, and the neurovascular examination findings were normal. Plain radiographs of the left foot showed no osseous abnormalities and no dislocation (Fig. 1). Sharp cortical margins were visible on the calcaneus,

with no signs of osteolysis or periosteal elevation. At that point, the differential diagnosis included gout, calcaneal stress fracture, Achilles tendinitis, and deep vein thrombosis. Magnetic resonance imaging demonstrated a large localized area of marrow edema centered within the posterior aspect of the calcaneus measuring 3.5 cm in the craniocaudal dimension and 3.5 cm in the anteroposterior dimension. No fracture lines were present, and the Achilles tendon was intact (Fig. 2). After magnetic resonance imaging evaluation, the patient underwent surgery for removal of the lesion and a biopsy.

The patient was placed under mild sedation, and an ankle tourniquet was applied for hemostasis. An oblique incision was made along the posterior aspect of the calcaneus. The incision was

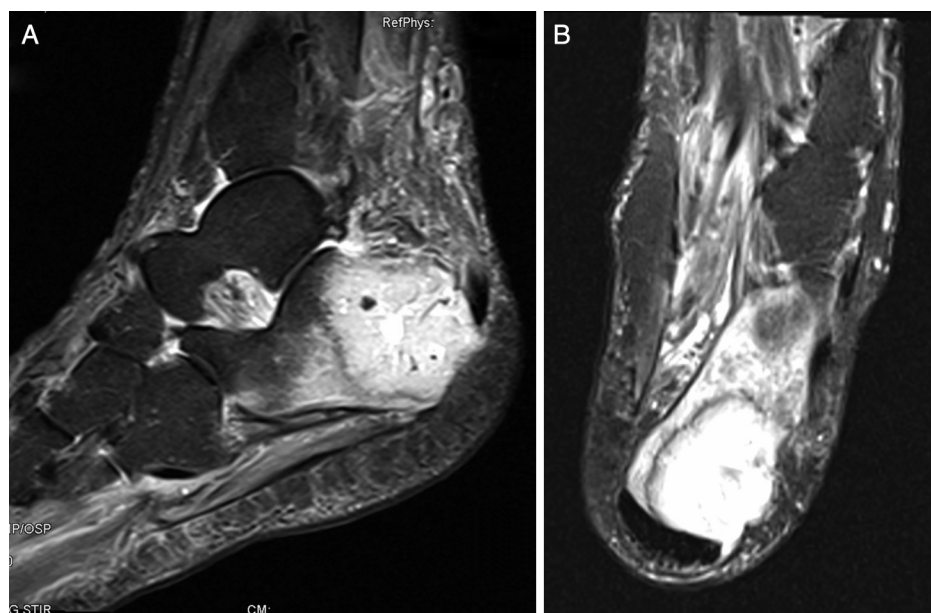


Fig. 2. Magnetic resonance imaging scans revealing large area of marrow edema involving the calcaneus. Achilles tendon is intact. No fracture line is visible. Sagittal short T1 inversion recovery of left ankle. (A) Note edema extending distally along plantar surface of calcaneus. (B) Axial T2 fat saturation of left foot showing large area of marrow edema involving the posterior calcaneus.

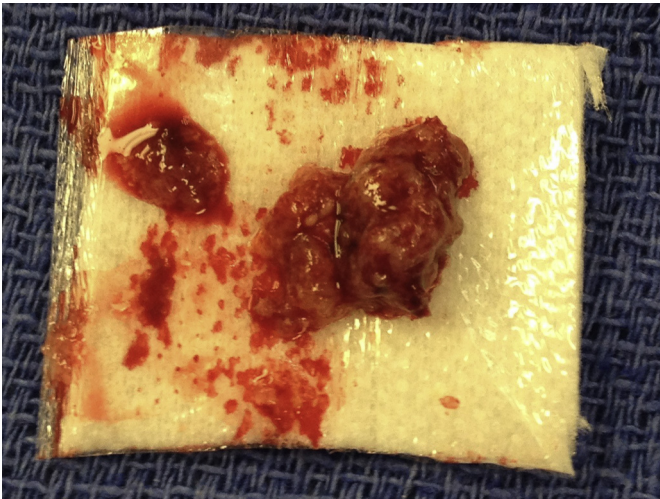


Fig. 3. Gross specimen of excised left calcaneal mass.

deepened to obtain clear visualization of the calcaneus, exposing a clear fracture within the calcaneus. A Freer elevator was then used to mobilize the fracture line, and it was noted that the calcaneal wall was weakened. Within the calcaneus, tissue that appeared gray was excised. The specimens were placed in formalin and a dry sterile container, and sent for histopathologic analysis (Fig. 3). Once the necessary amount of tissue had been removed, the wound was thoroughly irrigated with copious amounts of normal saline. A Jackson-Pratt drain was placed, and the wound was sutured with 3-0 nylon and dressed with sterile gauze and an elastic bandage.

Histopathologic analysis of the left calcaneal specimen revealed adenocarcinoma (Fig. 4) with features consistent with the patient's previous hysterectomy specimen (Fig. 5). An oncology consultation was requested after the pathology results had been obtained, and a diagnosis of metastatic carcinosarcoma of the calcaneus was confirmed. The gynecologic oncologist recommended obtaining a positron emission tomography-computed tomography scan, which revealed widely disseminated metastatic disease, with lesions present in the soft tissue of the left peritoneum, both lungs, the left inferior sacrum, the right hepatic lobe, and the left calcaneus (Fig. 6).

Given the widespread metastases, the patient was advised by the gynecologic oncologist to consider the option of systemic chemotherapy, with hope that she could achieve temporary remission.

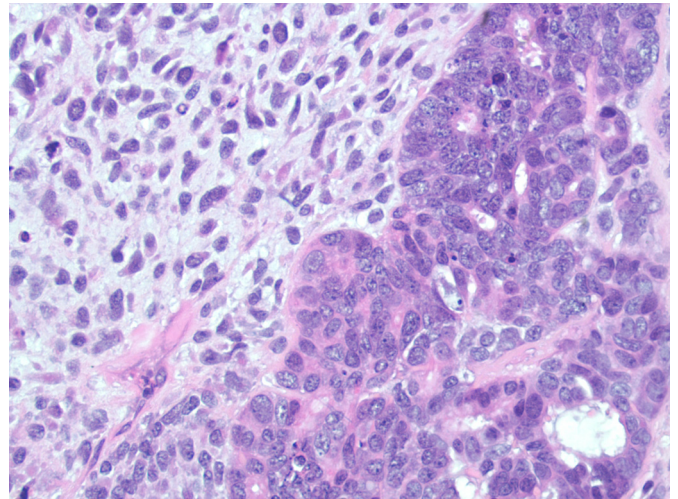


Fig. 4. Light micrograph of uterine specimen showing carcinosarcoma characterized by malignant glands with admixed malignant-appearing stromal cells set within chondromyxoid matrix (hematoxylin and eosin stain, original magnification $\times 100$).

Seventeen days after being admitted to the hospital, she was given 1 treatment of carboplatin and paclitaxel before being discharged to a hospice. She was scheduled for a follow-up visit at the radiation oncology clinic in 1 month but died of the metastatic tumor 2 weeks later.

Discussion

Malignant tumors frequently metastasize to the bone, although it is rare for metastasis to occur in the bones of the foot and ankle. The bones most frequently involved with metastases are the pelvis, vertebrae, ribs, sternum, and skull (5). Several studies have reported that metastatic tumors to the bones in the foot and ankle represent 0.01% of cancer cases (5–7). In a retrospective review of metastatic skeletal disease of the foot, Maheshwari et al (8) studied 694 patients with metastatic skeletal disease and found that only 2% (14 of 694) had foot and ankle metastases. The most frequent primary site was the genitourinary system, which accounted for more than 1/2 of the cases. This finding was consistent with those from other reviews.

The patient described in the present report was diagnosed with uterine carcinosarcoma, a rare neoplasm that causes less than 5% of all

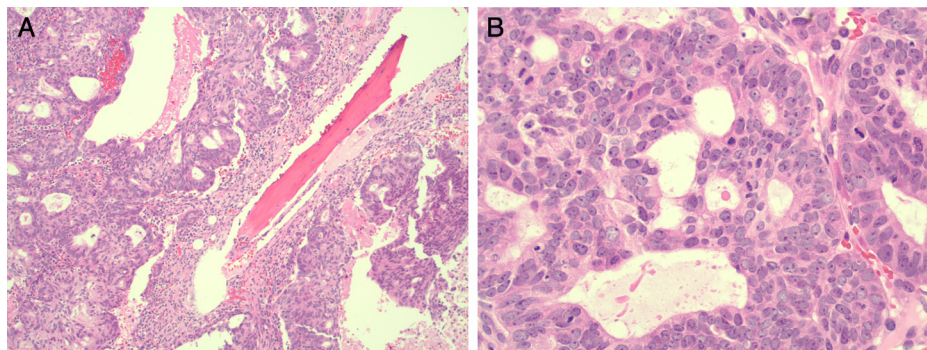


Fig. 5. Light micrograph of left calcaneal specimen showing features of adenocarcinoma characterized by malignant endometrioid glands lined by columnar cells with cribriform architecture. Note, similarity to some areas seen in the uterine specimen. Immunohistochemical studies confirmed gynecologic origin (hematoxylin and eosin stain). Original magnification (A) $\times 40$; (B) $\times 100$.

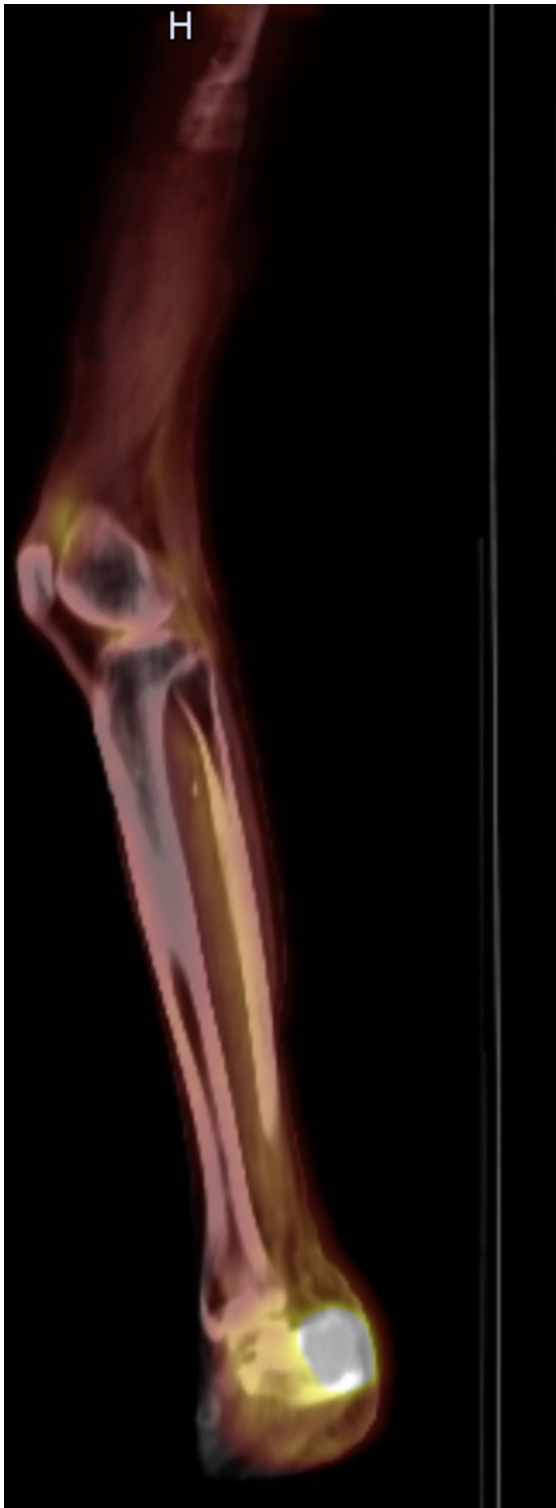


Fig. 6. Positron emission tomography-computed tomography scan without contrast of left lower extremity showing an infiltrative and hypermetabolic lytic mass in the left calcaneus.

uterine tumors. Patients diagnosed with this rare neoplasm often have a poor prognosis, with recurrence rates of approximately 50% (9). The known sites of distal metastasis in uterine carcinosarcoma include the lung, omentum, and pelvis (10,11). We have found no

documented occurrences of uterine carcinosarcoma metastasizing to the calcaneus.

To our knowledge, the exact mechanism of metastatic cancer to the calcaneus has not been definitively described in biomedical studies, although a few theories have been presented. It is known that tumor cells commonly metastasize to the most heavily vascularized parts of the skeleton, particularly where red bone marrow is present (12). The lack of red marrow in the calcaneus could explain why metastasis to this location is rare. Batson (13) theorized that distal metastases occur when tumor cell masses are passed by way of connections between paravertebral valveless veins and lower extremity vessels owing to coughing or abdominal straining. Another proposed mechanism is invasion by way of lymphatic drainage from the uterus (14). Gall et al (15) described other factors that might play a role in the location of metastasis, such as temperature differences, hormonal influences, and host immune responses.

Although the present patient had declined adjuvant therapy on the initial diagnosis of uterine carcinosarcoma, a recent multicenter cohort study showed that adjuvant chemotherapy improved progression-free survival of patients with uterine carcinosarcoma. Cantrell et al (16) studied the largest cohort of reported cases and found that women with stage I or II uterine carcinosarcoma who underwent adjuvant chemotherapy had improved progression-free survival rates compared with those who did not receive chemotherapy. Although this did not affect the overall survival rate, it did prolong the quiescent stage, which might have helped delay the onset of the patient's pain in our case.

Although this is a rare case, physicians must always keep a high index of suspicion for metastatic lesions of the lower extremity whenever a patient with a history of neoplasm presents with pain in the foot or ankle. Failure to properly diagnose the cause of the lesion can lead to inadequate or inappropriate treatment and prolong the patient's suffering. The importance of this was well documented in a case study by Trinidad et al (17) in a case of metastatic adenocarcinoma of the foot that was initially diagnosed as gout. The investigators exhorted clinicians to maintain a low threshold for imaging in these special circumstances, followed by aspiration or biopsy for a definitive diagnosis, with the ultimate goal of rapid recovery, adequate tumor resection, symptom relief, and retention of functional capabilities (17). Because distant metastasis often correlates with a poor prognosis, additional imaging modalities such as a positron emission tomography-computed tomography should be used to track widespread metastasis. Treating a patient with metastatic cancer is a multidisciplinary effort, and follow-up should be implemented with an oncologist to ensure the most appropriate treatment modalities have been instituted.

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Erratum

In the November/December 2013 issue (volume 52, issue 6, pp 714–716) of *The Journal of Foot & Ankle Surgery*[®], in the article “Computed Tomography Review of Tarsal Canal Anatomy with Reference to the Fitting of Sinus Tarsi Implants in the Tarsal Canal,” Figure 1 was incorrectly attributed to Osteotec of Dorset, UK. Although Orthotec is the distributor, in the UK, of this implant, and the representative of Orthotec did provide the image, Gamedica of Macomb, MI, is the maker of this implant and the copyright holder of this image.

We regret this error.

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