Management of a Metastatic Adenocarcinoma in the Midfoot: A Case Study

Gurvikram S. Boparai DPM¹, Margaret T. Kerins DPM¹, Ana A. Emirzian DPM¹, Matthew E. Greenblatt DPM¹, Felasfa M. Wodajo MD²

¹Foot & Ankle Surgery Resident, Inova Fairfax Medical Campus, Falls Church, ²Musculoskeletal Tumor Surgeon, Inova Fairfax Medical Campus

Statement of Purpose

Acrometastases are the rare occurrence of metastases distal to the elbow and knee and occur in just 0.1% of all cases, with pedal acrometastases accounting for 30-50% of these cases¹. Acrometastases most commonly originate from primary cancer in the lungs, colon, breast, and genitourinary tract; and tend to appear in patients with disseminated disease². This study demonstrates the unique presentation, management, and treatment of a patient with worsening right foot pain, who was found to have acrometastases to the medial midfoot in the setting of prior colonic adenocarcinoma.

Literature Review

Skeletal metastasis has been shown to have a prevalence of 30-75% in patients with primary cancer, especially common in advanced breast and prostate cancer¹. Bony metastasis is commonly confined to the axial skeleton, with the majority of those being found in the spine and pelvis¹. Acrometastases are the rare metastases to the hands or feet that occur at an incidence of 0.007% to 0.3% in the general population¹. The pathology manifests as bone destruction on imaging, and pain on palpation, however the low incidence often leads to misdiagnosis. Patients with acrometastases tend to present with intractable pain that is not responding to standard methods of care. Imaging studies such as plain films, CT, and MRI are valuable tools in the diagnosis and often demonstrate destructive, permeative lesions to the skeleton⁴. Fine needle aspiration (FNA) or image-guided biopsy may provide further valuable diagnostic information⁴. As no standard treatment exists, the options vary from conservative such as radiotherapy.

Literature Review Cont.

Chemotherapy, bisphosphonates, and analgesics, to more invasive procedures like amputation, resection, curettage, or implantation of poly methyl methacrylate (PMMA) bone cement⁵-⁷. Most patients with metastatic bone cancer have a limited life expectancy, and therefore goals of care include palliative treatment. PMMA cement allows for bony reconstruction, analgesia, and mechanical support. The analgesia can be attributed to the cement’s ability to penetrate trabecular bone thereby reducing micromotion, and the heat from the bone cement has been postulated to elicit a local anti-tumoral effect via thermal necrosis of the cancer cells⁸. Unfortunately, no differences in patient survival have been demonstrated between amputation and limb salvage procedures with wide surgical margins⁸.

Case Report

A 64 year old male with a history of colon cancer, diagnosed 7 years ago, who is s/p partial colon resection presented with severe, and worsening right foot pain. Advanced imaging demonstrated evidence of destructive lesions in the medial and intermediate cuneiforms, with extra-osseous extension into the deep plantar space and dorsal bone (Fig. 1, 2). Due to the severity of the patients PMH and metastases, the patient preferred to proceed with palliative care. Upon consultation with the Orthopedic Oncologist, the patient agreed to undergo curettage of the tumor with application of PMMA cement, and adjuvant radiotherapy to help reduce his pain and allow him to ambulate.

The surgery involved a longitudinal incision over the dorsal medial cuneiform with dissection down to bone. The medial and intermediate cuneiform bones were essentially absent (Fig. 3) and replaced with a crumbling, white semi-solid material. After curettage and resection, the forefoot was reduced via continuous longitudinal traction on the first ray to restore the arch and in this position the space was packed with PMMA cement. Pressure was held plantarly in the arch while the cement was filled into the crevices, thus successfully restoring the arch (Fig. 4 & 5). Intraoperative pathology confirmed the diagnosis of Adenocarcinoma. He underwent radiation therapy one month post surgery. At the one year follow-up, radiographs show mild degenerative changes in the midfoot without advancement of disease (Fig. 6), and although the patient has mild pain with activity, he remains ambulatory without assistance.

Analysis & Discussion

While Acrometastases to the foot, most commonly manifesting from primary subdiaphragmatic cancers, have a seemingly rare occurrence, they are not to be overlooked⁹. Pedal acrometastases represent disseminated disease and are associated with a dismal prognosis, having a mean survival time of 〈 6 months⁸. Given the common clinical presentation, these metastases are frequently misdiagnosed as more benign pedal conditions with a reported delay to diagnosis ranging from 1-24 months⁸.

This study demonstrates limb salvage in the management of metastatic adenocarcinoma through the use of curettage resection and PMMA bone cement grafting, and offers a viable alternative to amputation. As advances in cancer therapy aim to increase survival, we may begin to see an increase in the incidence of metastases and pedal acrometastases. It is of paramount importance to maintain a high index of suspicion not only in patients with a history of cancer but in patients with local pain and swelling that does not resolve appropriately, as a timely diagnosis can enhance a patient’s quality of life.

References


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