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CASE REPORT

Metastasis of Hepatocellular and Renal Cell Carcinoma to the Hand

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Summary: Malignant carcinoma metastasis to the skeleton is the third most common site of metastasis after lung and liver, usually involving the axial skeleton and the proximal ends of long bones, ribs, and vertebrae. Acrometastasis, metastasis to hands or feet, comprises only 0.1% of all metastases. Here, we present 2 cases of acrometastasis, one from hepatocellular carcinoma and the other from renal cell carcinoma. We describe the presentation, radiographs, surgical treatment, and outcomes for each patient. Patients presented with swelling and pain at the tumor sites and were treated with amputations. The second patient's disease progressed resulting in death shortly after amputation indicating acrometastasis may be a poor prognostic indicator of survival. We review the literature and discuss the importance of disease process recognition and prognosis. *(Plast Reconstr Surg Glob Open 2013;1:e83; doi: 10.1097/GOX.0000000000000021; Published online 18 December 2013.)*

The skeleton is the third most common site for metastasis of malignant carcinoma after the lung and liver, most frequently involving the axial skeleton and the proximal ends of long bones, ribs, and vertebrae.[1] Acrometastasis, metastasis to hands or feet, comprises only 0.1% of all metastases. The distal phalanx is most frequently involved, followed by metacarpals and remaining phalanges.[2,3] Acrometastases typically arise from primary lung, kidney, and breast tumors in decreasing order of frequency.[3] Here, we report 2 cases of hand acrometastasis, one from hepatocellular carcinoma (HCC) and the other from renal cell carcinoma (RCC). Acrometastasis, a poor prognostic indicator of survival, requires the plastic hand surgeon to understand prognosis and treatment to appropriately manage these patients.

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CASE 1

A 30-year-old man presented to the clinic for bleeding masses of the left ring and small fingers. His medical history consists of Hepatitis B and HCC with metastasis to the brain and phalanges of the left hand. He underwent 2 craniotomies, Gamma knife treatment for the brain metastasis, and chemotherapy and radiation to the left hand. Physical examination revealed blistering masses of the left ring and small fingers that bled and enlarged over several days and weeks, respectively, before presentation (Fig. 1). The hand was nonfunctional, diffusely tender, and exhibited muscular wasting. Radiographs demonstrated an aggressive lesion in the second metacarpal and a transverse lucent lesion with nondisplaced fracture in the fourth distal phalanx (Fig. 2). Surgical treatment consisted of palliative amputation to the middle phalanx of the ring and small fingers. With an uneventful recovery, the patient was discharged home on postoperative day 5 on chemotherapy. The wounds healed without complication (Fig. 1).

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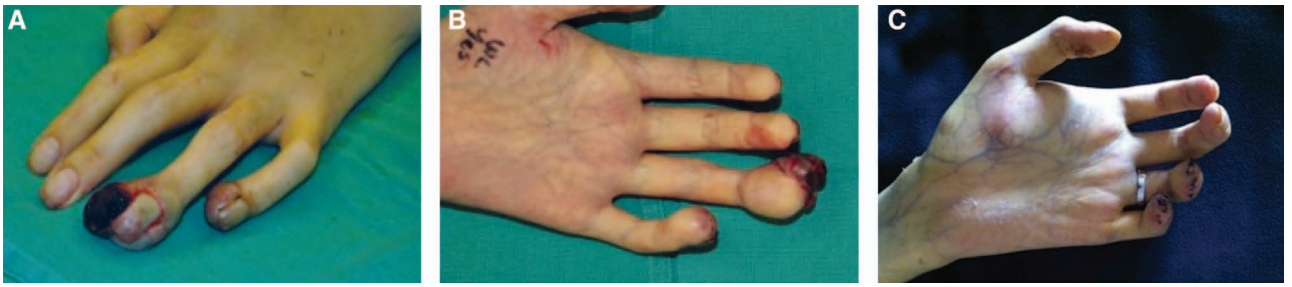

Fig. 1. Preoperative dorsal (A) and volar (B) views of metastatic lesions to the left ring and small fingers and 4 wk postoperative volar (C) view.

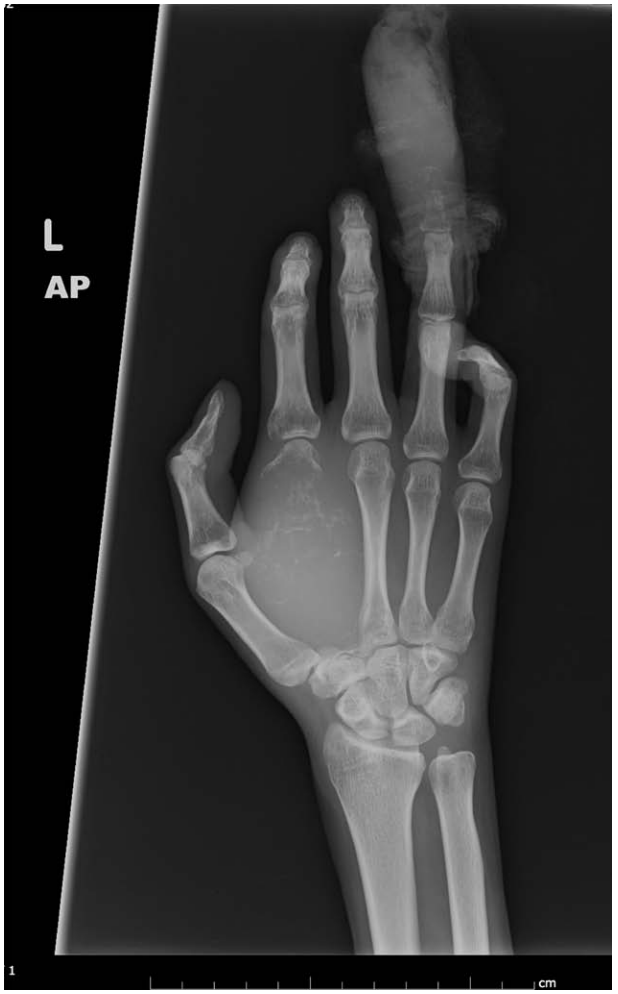

Fig. 2. Anteroposterior plain radiograph of left hand upon presentation. Note the ring finger is bandaged at the time of the radiograph.

CASE 2

A 66-year-old right-hand-dominant African American woman presented to the clinic with masses of the right index and left middle fingers. Her medical history consisted of RCC without signs of systemic disease, treated with robotic nephrectomy and chemotherapy. Physical examination revealed swelling of the right index and left middle fingers (Fig. 3). She had full range of motion but tenderness to palpation at the tumor sites. Radiographs reveal an extensive osteolytic lesion in the distal phalanx of the left middle finger (Fig. 4). Surgical treatment consisted of palliative amputation to the distal phalanx of the right index finger and middle phalanx of the left middle finger (Fig. 3). Without complications from this procedure, the patient's disease progressed resulting in death 4 months later.

DISCUSSION AND REVIEW OF LITERATURE

British surgeon Handley[4] first described the rare phenomenon of acrometastasis to the hand in 1906 when reporting a case of a woman with breast carcinoma later developing multiple metacarpal metastases. In 2008, Flynn et al[3] reviewed 257 cases demonstrating the distal phalanx as the most common site of metastasis, followed by the metacarpal, proximal phalanx, middle phalanx, and the carpals. Almost half of these cases stemmed from primary lung (44%), kidney (12%), breast (10%), and colon cancers (6%).[3] Since then, 29 more cases have been reported including primary pulmonary, renal, and vaginal carcinomas[5] and follicular carcinoma of the thyroid.[6] Clinical presentation is a painful, warm, swollen, and/or erythematous lesion usually resulting in functional impairment. Advanced tumors can appear ulcerated and cause severe irritation. Radiologic appearance demonstrated by irregular osteolytic lesions lacking a periosteal reaction[7] coupled with the presence of a history of malignancy should raise suspicion for acrometastasis, although the differential diagnosis includes gout, rheumatoid arthritis, whitlow, osteomyelitis, fistula, and osteoarthropathy.

Estimated that 10% of acrometastasis become symptomatic before a primary tumor is discovered,[8] it was the initial presentation of occult tumors in 10 of the 29 (34%) reported cases since 2008. Patients were misdiagnosed with osteoarthritis or infection based on presentation.[9,10] Radiographic osteolytic changes prompted a malignancy work-up after histo-

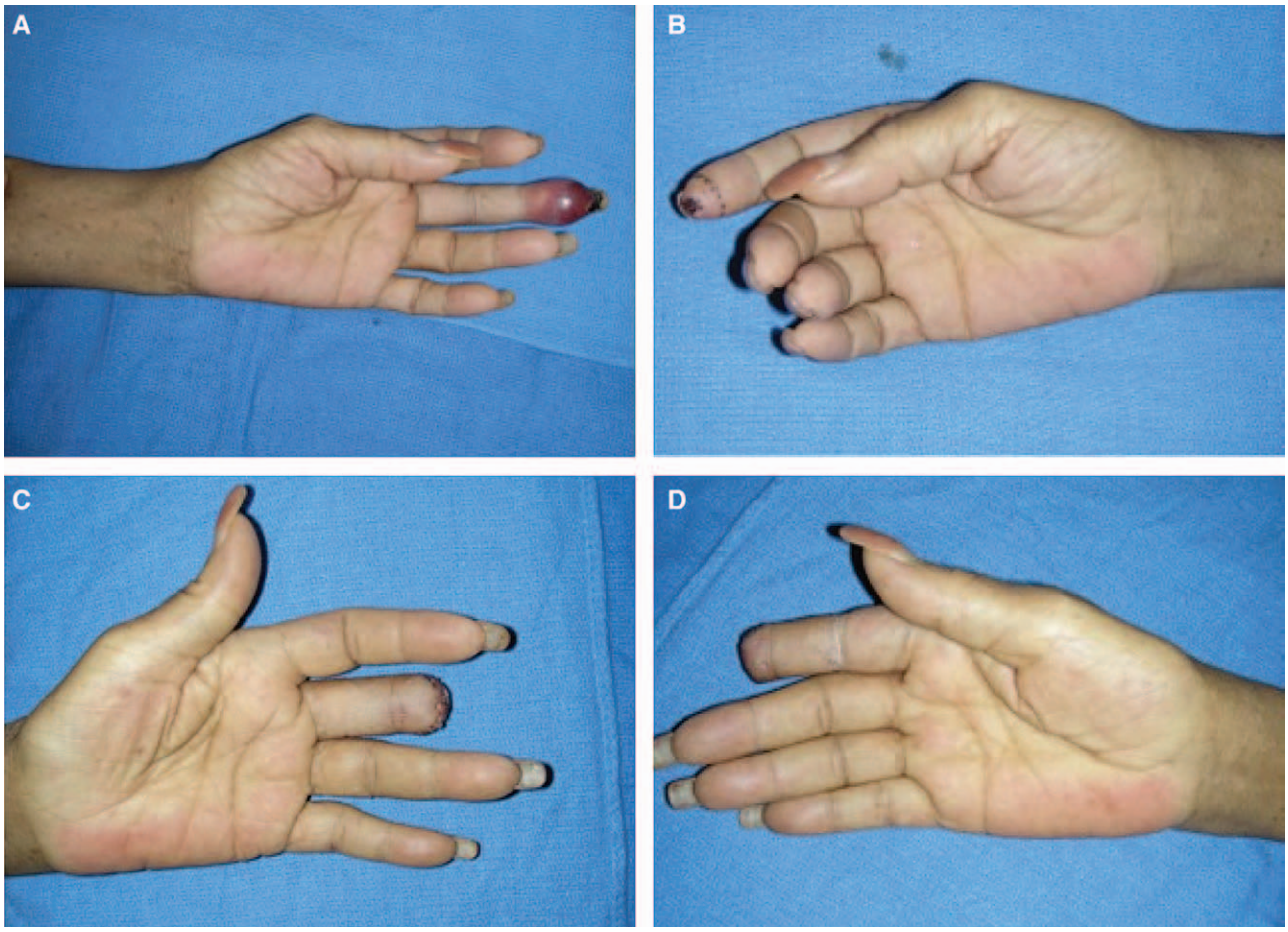

Fig. 3. Preoperative volar view of metastatic lesions to left middle finger (A) and right index finger (B) and postoperative volar view of left middle finger (C) and right index finger (D).

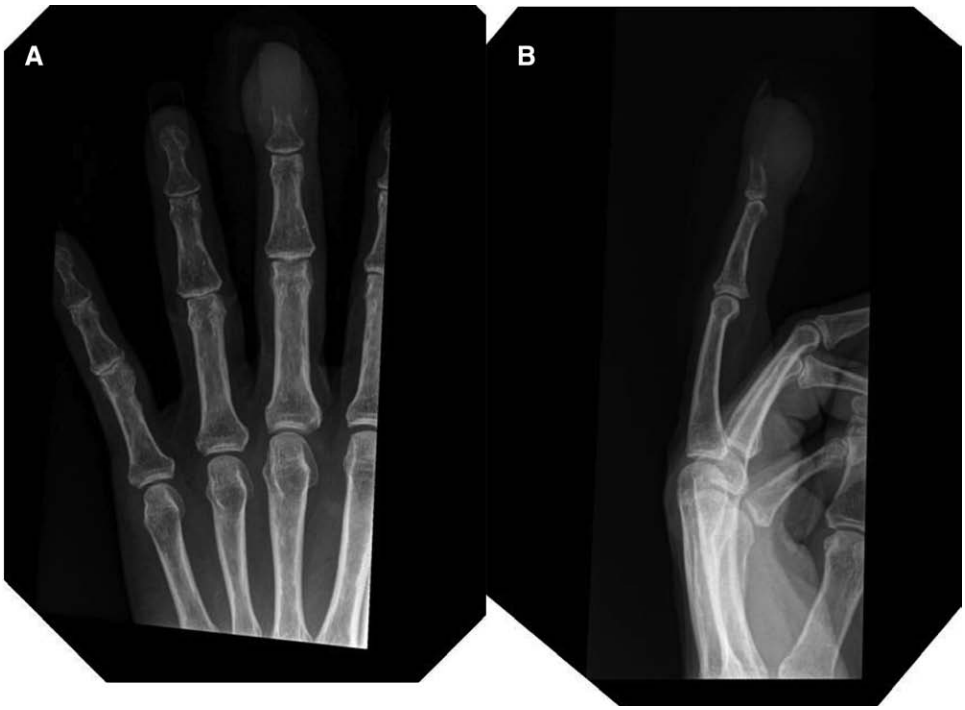

Fig. 4. Anteroposterior (A) and lateral (B) plain radiographs of left hand upon presentation.

logical confirmation. However, Bhandari and Brown[11] reported one case of persistent pain 3 months before radiographic changes increasing the need for high suspicion of acrometastasis in persistent pain refractory to nonsteroidal anti-inflammatory drugs or antibiotics.

Not limited to bone, acrometastasis to the skin and soft tissues without skeletal involvement can also occur. Aydin et al[12] reported a laryngeal carcinoma metastasizing to skin overlying the palmar surface of the left fifth metacarpal joint, and Afshar et al[13] reported a gestational choriocarcinoma metastasizing to the junction of the hyponychium and nail bed of the small finger of the dominant hand.

The mechanism of acrometastasis remains poorly understood. The phalangeal absence of bone marrow has led to alternative theories for hematologic spread[14] including increased blood flow and trauma. The release of prostaglandins and local chemotactic factors can promote cell migration and adherence to bone.[8] Observation that dominant hand metastasis occurs more commonly supports this theory as that hand receives more blood flow and is more prone to trauma than the nondominant hand.[15]

Given the advanced stage of disease upon presentation with a mean survival of 6 months, the goal of treatment is palliation.[3] Although zoledronic acid and denosumab are often indicated to treat bone metastasis of primary solid tumors, their primary mechanism of action is the inhibition of osteoclasts from resorbing bone, limiting their use in acrometastasis where osteolysis has already occurred.[16] Early detection, as in the case of Bhandari and Brown,[11] may benefit from these medications to prevent progression.

Unfortunately, acrometastasis is usually detected late, making aggressive modalities such as curettage, wide excision, chemotherapy, radiation, and amputation necessary to achieve palliation.[6] The lesion site also contributes to the treatment approach. Proximal and thumb lesions are best managed conservatively with radiation providing immediate pain relief while maintaining normal function.[17,18] Distal lesions or lesions unresponsive to radiation require palliative amputation to provide comfort in the patient's end of life.[3] Acrometastasis represents a poor prognosis with a survival rate of approximately 1 year with therapy[19]; therefore, reconstruction is not typically considered unless the patient remains tumor free for 2 to 3 years.[20]

CONCLUSION

Acrometastasis from a primary RCC or HCC is a rare condition carrying grave prognostic indicators. It is important for plastic hand surgeons treating patients to understand implications of discovering such a lesion; although curative resection is unlikely, palliative resection should be considered.

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