

# ACROMETASTASES

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**Metastases to the small bones of the hands and feet are a rare occurrence. The author reports five cases from his personal experience and reviews the literature. Bronchogenic carcinoma appears to be the principal contributor to hand metastases. Although there are approximately 150 reported cases, the true incidence is probably greater due to lack of reporting and lack of attention to the extremities in routine screening procedures. X-ray appearance is uniformly lytic. Local radiotherapy gives palliation.**

Acrometastases is a term, first coined by German authors,<sup>1,2</sup> given to metastatic lesions appearing in the small bones of the hands and feet. Such occurrences are allegedly rare, and relatively few cases have been reported, at least in the medical literature in English. This is perhaps surprising in view of the fact that the small bones of the hands and feet comprise 106 of the 206 elements of the human skeleton. The purpose of this paper is to present five case reports from the author's personal experience, each of which had histologically proven metastases, as well as a review of the literature.

## CASE REPORTS

### Case 1

J.T., a 76-year-old white man with a diagnosis of primary disseminated carcinoma of the descending colon, with multiple bone metastases in the pelvis, presented with pain and swelling of the root of the right thumb. X-rays taken on June 9, 1967 revealed an osteolytic lesion involving the proximal pha-

lanx of the thumb. Radiation therapy was delivered from June 9 to June 19 for a total tumor dose of 2,324 rads in seven increments. A cesium<sup>137</sup> teletherapy unit was used at 35 cm source-skin distance (SSD) with a 5 × 5 cm field. No marked decrease of pain was observed at the completion of treatment. Metastases were histologically proven.

### Case 2

M.F., a 50-year-old white woman with a previously established diagnosis of bronchogenic carcinoma, presented on March 16, 1967 with a swollen and tender proximal phalanx of the right middle finger (Figure 1, left). X-rays confirmed the presence of an osteolytic lesion (Figure 1, right). Radiation therapy was delivered to a total tumor dose of 2,940 rads in seven increments employing a cesium<sup>137</sup> teletherapy unit at 20 cm SSD with a 4 × 4 cm field. Excellent relief of pain was obtained. The patient died six weeks later having deteriorated rapidly following the onset of histologically proven brain metastases.

### Case 3

R.J., a 63-year-old white man with an established diagnosis of disseminated bronchogenic carcinoma, was being treated for both his primary lesion and a metastatic site in the right shoulder. He suddenly developed a pain in the right hand. X-rays taken on October 10, 1966 revealed two osteolytic lesions. One involved the distal portion of the proximal phalanx of the middle finger, the other, the distal portion of the first metacarpal. Metastases were proven histologically.

Radiation therapy was delivered to the entire hand to a total tumor dose of 2,350 rads in eight increments. A 150 KVP orthovoltage unit was used with a 10 × 15 cm field covering the entire hand. Even while this treatment was taking place the patient developed pain in his right foot. X-rays

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**Figure 1.** Appearance of finger on March 16, 1967, left. X-ray showing an osteolytic lesion of proximal phalanx, right

confirmed the presence of an osteolytic lesion involving the first metatarsal. Radiation therapy was delivered to the foot, employing the same factors and the same dose as above. Good pain relief was obtained in both sites, although residual local swelling was still visible on the patient's last visit on December 22, 1967. He was subsequently lost to follow-up.

#### Case 4

C.B. was a 63-year-old white man with a diagnosis of adenocarcinoma of the prostate. He had had a perineal prostatectomy nine years previously and was referred from his private physician with complaints of pain in the right heel. X-rays taken on December 19, 1966 revealed an osteoblastic lesion involving the left os calcis (Figure 2). Metastases were proven histologically.

Radiotherapy was delivered to a total 5,200 rads

tumor dose in 20 increments through parallel opposed  $6 \times 10$  cm ports employing a cesium<sup>137</sup> teletherapy unit at 15 cm SSD. The patient had no further symptoms from his right foot. He later developed metastases in the left leg necessitating amputation. He was last seen on September 12, 1970 at which time he presented with bilateral pulmonary metastases.

#### Case 5

I.H. was a 62-year-old white woman with a diagnosis of alveolar cell carcinoma of the lung. She had had several previous courses of chemotherapy and presented on November 1, 1977, with swelling and erythema of the dorsum of the left foot immediately adjacent to the great toe. A bone scan revealed an increased concentration at this site, and x-ray confirmed the presence of an osteolytic



**Figure 2. Osteoblastic lesion in right os calcis from primary carcinoma of the prostate**

lesion involving the distal head of the first metatarsal (Figure 3, left). Local irradiation to a total tumor dose of 2,000 rads in five fractions was delivered with 18 MeV electron beam with a 6 cm diameter circular cone. Excellent relief of pain was obtained within the first two or three treatments. Two weeks later, the patient presented with tenderness and swelling of the dorsum of the left hand. X-rays confirmed an osteolytic lesion involving the middle metacarpal (Figure 3, right). Radiation therapy was delivered with the same factors and dosage as above to this new site. Pain relief was excellent. The patient expired three months later of disseminated disease. Metastases were proven histologically.

## REVIEW OF THE LITERATURE

The first clinical description of peripheral bone metastases to the small bones of the hand was by Handley<sup>3</sup> in 1906. This diagnosis was achieved by clinical signs alone without the benefit of x-rays. A

year later, Massary and Weill<sup>4</sup> published the first case documented by x-rays. Since then, scattered reports of acrometastases involving either the upper or the lower extremities have appeared sporadically in the literature. The first American authors reporting this phenomenon were Floridis and associates.<sup>5</sup> Although mostly associated with disseminated disease, peripheral bone metastases sometimes accounted for the first symptom of the neoplasm.<sup>6-9</sup> Other reports essentially underline the misleading aspects of the presenting symptoms of acrometastases often simulating arthritis or local infection.<sup>10-12</sup> Major reviews of the literature appeared successively in Kerin,<sup>13</sup> Trachtenberg and Roswit,<sup>14</sup> Toubiana and Proux,<sup>15</sup> and Bouvier et al.<sup>16</sup> In 1958, Kerin<sup>13</sup> reported on seven personal cases and 23 cases gleaned from earlier literature. Fifty percent of these had primary tumors of lung origin. In 1961, Trachtenberg and Roswit<sup>14</sup> reviewed 31 cases and presented four of their own. Once again, half were bronchogenic primaries. Mulvey,<sup>17</sup> in 1964, reported six cases and also noted the autopsy findings of one of the patients



**Figure 3. Osteolytic lesion in first metatarsal, left. Osteolytic lesion of the middle metacarpal, right. Primary tumor was in the lung**

who presented with neoplastic cells in the left chambers of the heart. Toubiana and Proux<sup>15</sup> reported on 69 cases, including five personal reports in 1965. Lesions of the hand outnumbered those of the foot in a ratio of 2:1. This figure continues to be borne out by recent data. While bronchogenic carcinoma appeared to have a predilection for the bones of the hand, metastases from breast cancer appear to be more equally distributed between the upper and lower extremities. A curious predilection of gynecologic cancer for the lower extremities was noted (five out of six cases).

The most recent, as well as the most exhaustive, major review of the literature appears under the pen of Bouvier et al<sup>16</sup> in 1971. They described 256 cases of peripheral bone metastases. However, the series includes the bones of the forearm

and the leg. If these are excluded, 135 cases of acrometastases are left. The proportion of 2:1 in favor of the hand bones continued to be found, and bronchogenic carcinoma accounted for 37 percent of the primary sites closely followed by cancer of the breast with 20 percent. Other sites included the uterus (10 percent), gastrointestinal (8 percent), kidney (7 percent), and prostate (7 percent).

Since this review, eight additional publications have appeared,<sup>18-25</sup> the last one in February 1980. Nine cases are reported, seven involving bones of the hand and two of the foot. This, in addition to the five cases reported in this paper and the three described by Mangini<sup>26</sup> bring the total of reported cases of acrometastases to 152 at the time of this writing. Two thirds of these represent involvement of the hand.

## CLINICAL FINDINGS

Pain and swelling are the most common signs of this condition, often being mistaken, as previously noted, for inflammatory changes of a benign nature. The lesions are practically always lateralized with bilateral involvement being extremely rare.<sup>27-29</sup> The radiographic appearance of the lesions is invariably osteolytic in nature, although the authors' report of prostatic cancer (Case 4) describes an osteoblastic lesion.

## CONCLUSION

Acrometastases occur relatively rarely. The medical literature to this date has reported 152 cases. The absolute reported incidence is in the order of 0.3 percent (three out of 1,165 skeletal malignancies in Mangini's report<sup>26</sup>) or four out of 2,532 (0.15 percent) according to Wolf.<sup>27</sup> The actual prevalence may be somewhat higher. The authors' experience includes five cases accumulated over a 15-year period. Anecdotal knowledge of at least another two cases has been brought to this author's attention (MN Prout, personal communication, August 1978, and GG Potdar, personal communication, July 1978). It is postulated that many such cases are not published and that many more would be discovered were they sought. Indeed, conventional bone surveys usually exclude the distal skeleton as do some of the bone scanning techniques. Even after allowances are made for these factors, acrometastasis remains an infrequent occurrence. In the presence of symptoms involving the extremities simulating arthritis, infection, or other inflammatory changes, especially in a patient bearing a diagnosis of bronchogenic carcinoma, this entity must always be kept in mind.

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