

## A Report of Two Cases of Metastatic Lung Cancer Simulating Gout

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### Abstract

Metastatic carcinoma to the foot is a rarely reported event, and may easily be mistaken for more common problems such as acute gout. Furthermore current emphasis on PET scanning for tumor surveillance may not include the distal lower extremities. The author presents two cases of metastatic lung cancer to the distal lower extremity that were initially thought to represent gout.

**Keywords:** Lung cancer; Foot metastasis; Gout; Non-small cell lung carcinoma

### Introduction

Bone metastases are very common in some cancers, occurring in 65-75% of prostate and breast malignancies [1]. Lung carcinoma metastasizes to bone fairly commonly as well, with an incidence of 36% in autopsy cases [2]. However foot metastases are very rare indeed, occurring in only 0.007 to 0.3% of cancer cases [3]. Among these unusual occurrences, lung cancer is the 3<sup>rd</sup> most seen cancer metastatic to foot, after colon and kidney, as spread to the lower extremities is more frequent in tumors that originate below the diaphragm [4]. There are scattered case reports of lung carcinoma metastatic to the feet, and almost universally the diagnosis is delayed by mistaking the pain for more common problems, especially gout [3-9].

This paper presents two patients who presented with foot pain initially felt to be gout but proven to be metastatic lung carcinoma.

### Case 1

Patient 1 is an 84 year-old male who was diagnosed with stage one squamous cell lung carcinoma of the lung 6 months prior to presentation. He was treated with radiation for cure, but 8 months later found to have a lymph node with a positive biopsy for carcinoma, and re-treated with a combination of chemotherapy and radiation with subsequent negative Positron Emission Tomography (PET) scan and no evidence of disease.

The patient saw several physicians one month prior to presentation with a new complaint of right mid foot pain among other issues. Gout, neuropathy, and previously documented lumbar stenosis were suspected, and he was treated with ibuprofen without improvement. Uric acid was borderline at 6.4 mg/dL, and an X ray was ordered but not done.

He represented 2 weeks later with persistent pain and now mild edema. He was given hydrochlorothiazide without improvement.

He returned a few days later, now with redness and warmth over the right mid foot. X-ray showed soft tissue edema in the symptomatic area, and osteoarthritis in the 1<sup>st</sup> metatarsal joint and in the tibotalar joint (Figure 1) Tibial intermedullary rod was in good position from fracture 7 years previously. Consideration for cellulitis versus inflammatory arthritis was given, and he was placed on antibiotics. He was referred to the orthopedic rheumatology clinic where he was seen two days later.

The patient reported that he first has an episode of pain and swelling 6 months previously, but it resolved spontaneously with several weeks, and he did not seek medical attention. He was now having progressive difficulty ambulating due to the pain in the mid foot.

Examination showed no evidence of inflammatory arthritis or tophi outside of the right foot. The right foot showed moderate edema with mild redness, and diffuse tenderness of the mid foot on the dorsal surface.

Labs showed elevated sedimentation rate of 83 mm/hour and C reactive protein of 3.5 mg/dL, uric acid of 5.3 mg/dL, and negative rheumatoid factor and cyclic citrullinated antibody.

Magnetic Resonance Imaging (MRI) was ordered which revealed a 4.5 × 1.4 × 2 cm rim enhancing mass with a necrotic center eroding into the plantar surface of the second metatarsal (Figures 2 and 3).

Subsequent fine needle aspirate confirmed metastatic squamous cell carcinoma.

He was begun on local radiation therapy with considerable improvement in his symptoms.

However 3 weeks later he was hospitalized with pneumonia and found to have an obstructive bronchial lesion, which was positive for squamous cell carcinoma.



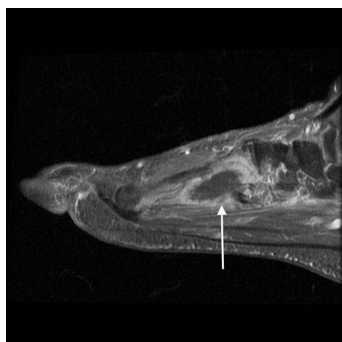
Figure 1: AP radiograph of the foot showing no mid foot pathology.

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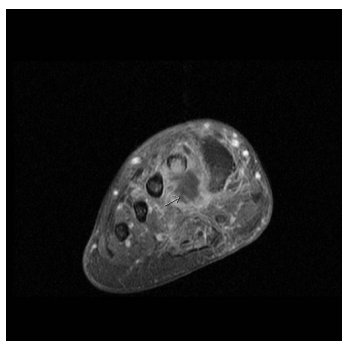
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**Figure 2:** Sagittal and coronal MRI views of the foot with enhancing mass with necrotic center eroding into the 2<sup>nd</sup> metatarsal.



**Figure 3:** Sagittal and coronal MRI views of the foot with enhancing mass with necrotic center eroding into the 2<sup>nd</sup> metatarsal.

He made the decision to entire hospice and expired 2 months later.

## Case 2

Patient 2 is a 74 year-old female roun 2 years previously to have a 2.6 × 2.6 cm right upper lobe mass with adjacent adenopathy. Biopsy was positive for adenocarcinoma, but she was not felt to be a surgical candidate. She was treated with a combination of radiation and chemotherapy, as well as monthly zoledronic acid.

One year later she was found to have a new lung nodule with increased activity on PET scan, but two biopsies were both negative for malignancy.

Four months later, she had an episode of pain and swelling in the left ankle and proximal foot. She was felt to probably have gout clinically, although uric acid at the time was 3.4 mg/dL. She was given a short course of probenacid and colchicine with resolution of her symptoms.

Eight months later a repeat PET scan showed some improvement in the lung nodule. At about the same time she noted recurrence of pain in the left ankle with mild redness and warmth on exam. Repeat uric acid was 2.8 mg/dL. X ray of the left ankle showed no abnormalities. She was treated with meloxicam with initial improvement, but her symptoms returned several weeks later. She was also placed on prednisone for chronic cough, and referred to orthopedic rheumatology clinic.

The patient reported that on the prednisone, her symptoms had almost completely resolved.

On exam she had tenderness in the left shin just above the ankle, but no redness, edema or synovitis.

She was noted to have some tenderness and bony enlargement of the right 5<sup>th</sup> DIP, with overlying slight redness but no synovitis. No clubbing was noted.

X-ray of the hand was consistent with DIP osteoarthritis with no cortical thickening.



**Figure 4:** AP radiograph showing lucency in the distal tibia.



**Figure 5:** Nuclear bone scan showing marked uptake in the left distal tibia.



**Figure 6:** Sagittal MRI view of the left ankle with large distal tibia mass.

X-ray of the left ankle showed a 2 cm distal tibia lucency not seen on image 6 weeks earlier, with no cortical thickening (Figure 4).

Nuclear bone scan showed increased uptake in the distal tibia (Figure 5).

MRI confirmed an enhancing  $1.5 \times 2 \times 2.5$  cm mass. Biopsy showed metastatic adenocarcinoma (Figure 6).

She has completed radiation therapy and is currently undergoing chemotherapy with good response.

## Discussion

Both of these cases illustrate a rare but serious disease hiding behind the mask of a much more common problem. Generally we are taught to suspect cancer when bone pain is persistent and progressive. Yet both of these patients had initial episodes of pain and swelling suggestive of gout, and following a typical time course for gout by resolving within several weeks. Constant symptoms did not begin until 5-6 months later. One might surmise that the first episode may have coincided with implantation and an early immune response.

Both cases also share falsely reassuring PET scans, as well as initially negative plan films at the onset of the second round of symptoms. PET imaging has become a common means of staging and restaging of non-small carcinoma of the lung [10-14]. In general, PET scans have been demonstrated to be more sensitive than nuclear bone scans at detecting skeletal metastasis (91% versus 75%) [14] as well as more specific (90% versus 70%) [11]. In the cases presented, the PET scans at two different facilities imaged only to the mid thigh, and thus they were not able to detect metastases below the knee.

Bone metastases are an important cause of morbidity as well as decreased quantity and quality of life in patients with lung carcinoma [15-17]. Skeletal Related Events (SRE) include bone pain requiring radiation, pathological fractures, instability requiring orthopedic surgery, and spinal cord compression. Patients with lung cancer average 2.7 SRE per year, with multiple events in the same patient common [15]. After the first SRE, median survival is only four months [17]. A randomized controlled trial of the bisphosphonate zoledronic acid reduced the occurrence of SREs from 48% in placebo to 39%, decreased the annual rate from 2.71 to 1.74, and increased time to onset

of first SRE from 155 days to 236 days. The one case presented here on zoledronic acid suffered her first SRE over 2 years after diagnosis.

These cases illustrate the importance of having a high degree of suspicion in patients with known lung carcinoma who present with gout like symptoms or skeletal pain, even with normal plan radiographs. Obtaining further imaging with PET in the area of symptoms, nuclear bone scan, or MRI may lead to an earlier diagnosis, which can help earlier interventions to reduce further SREs and improve quality of life.

## Disclosures

The author does not have any issue to disclose.

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