Importance of imaging in knee pain

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ABSTRACT

A 72-year-old woman with a prior history of stage IIIa lung adenocarcinoma was seen with complaints of knee pain, swelling, and difficulty sleeping at night for 1 month. Although mimicking osteoarthritis, patellofemoral syndrome, and iliotibial band syndrome, radiographs showed a lytic lesion suspicious for metastatic disease. The right tibial lesion was excised, saphenous neurolysis was performed, and radiation treatment and four cycles of chemotherapy were administered. This case shows the importance of early imaging in patients with knee pain of prolonged duration seen in the primary care setting.

KEYWORDS Imaging; joint pain; knee pain; metastatic disease; musculoskeletal disorder; osteoarthritis; patellofemoral pain

Joint pain is a common primary care complaint. In the US, an estimated 126.6 million people suffer from a musculoskeletal disorder, with an estimated cost of \$213 billion annually.¹ Knee pain is the second most prevalent condition, and patellofemoral pain is considered one of the most common forms of knee pain.¹ Specifically, knee pain affects up to 25% of adults and can cause significant disability and also limit quality of life.^{2,3} We report a case of a woman with classic symptoms of knee pain.

CASE DESCRIPTION

A 72-year-old white woman presented to her primary care physician in March 2016 with a complaint of knee pain of 1 month duration with continuation into the night causing difficulty sleeping. She had a history of melanoma and stage IIIa adenocarcinoma of the lung, which had been treated with neoadjuvant chemotherapy followed by surgery with subsequent adjuvant chemotherapy completed in November 2011. She was then diagnosed with a recurrence of her tumor at the stump and was started on chemoradiotherapy. She received her last weekly treatment in December 2013.

Alleviating factors included acetaminophen. On physical examination, the medial right knee was tender but devoid of

effusion, erythema, or evidence of infection. The range of motion was 0–120 with minimal crepitus and no joint instability. She was able to bear weight. Osteoarthritis was considered the likely diagnosis. Due to her history of lung cancer and melanoma, radiographs with three views were performed and revealed a 3.8 × 3.4-cm lytic lesion within the proximal meta-epiphyseal region of the right tibia (*Figure 1*). In addition, the proximity of the lesion to the articular surfaces of the media-tibial plateau placed the patient at risk for future fracture. The patient was referred to hematology/oncology, who considered recurrence of the patient's previous malignancies vs. possible myeloma and ordered a bone scan and computed tomography scan, which showed increased activity at the right media-tibial plateau corresponding to the lytic abnormality on the radiograph and consistent with metastatic disease. Mildly increased activity was also seen in a linear horizontal distribution at the sixth thoracic vertebral body that was consistent with remote vertebral body compression fracture. Interventional radiological biopsy of the right tibia bone showed metastatic, poorly differentiated carcinoma that was positive for TTF-1 (nuclear) as well as focally positive for Napsin-A (cytoplasmic) on immunostaining, compatible with metastasis from previous lung carcinoma (*Figure 2*).

The right tibial lesion was excised and saphenous neurolysis performed. Thereafter, 4500 cGY in 15 fractions was

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Figure 1. X-ray of the right leg showing lytic lesion in the tibial region.

Figure 2. Metastatic poorly differentiated carcinoma in bone, (a) 10× and (b) 20×.

administered, followed by systemic chemotherapy of four cycles of carboplatin plus pemetrexed with pegfilgrastim added in cycle 3. Computed tomography in December 2018 showed no evidence of disease. The patient was hospitalized twice since then for dyspnea and a gastrointestinal bleed, but she is currently stable with no signs of recurrent lung cancer.

DISCUSSION

This patient presented with classic knee pain symptoms consistent with osteoarthritis. However, due to her past medical history of melanoma and lung adenocarcinoma, imaging was ordered that uncovered the presence of metastasis, showing the importance of imaging in cases of knee pain of prolonged duration.

The leading cause of cancer-related deaths worldwide is lung cancer.⁴ In the course of disease, many patients experience bony metastases, and the prognosis in this situation is poor. On average, survival rates are 6–8 months, compared with 12–15 months in patients with metastatic lung carcinoma elsewhere.⁵ Metastatic bone tumors are far more

common than primary bone tumors.⁶ In fact, metastases to the foot are most frequently from lung carcinomas.⁵ Since patients' symptoms are often vague, as was the case with this patient, they are first worked up for more common conditions, which can delay diagnosis from 1 to 24 months.⁶ Most of the bony metastases from lung adenocarcinoma are osteolytic and put the patient at high risk for fracture.⁵

In the US, musculoskeletal disorders such as knee pain exact a huge economic burden through health care costs and sickness absence. In fact, the annual prevalence of patellofemoral pain, which is considered one of the most common forms of knee pain in the general population, was 22.7% in 23 studies,¹ which is much higher than that of metastatic cancer. Nonetheless, in patients with a strong family history or personal history of cancer, it is reasonable to work up nontraumatic knee pain with imaging. Furthermore, in patients with worsening pain, imaging would also be sensible. Of course, differentials such as trauma, inflammatory disease, and arthritis should be considered first, but this report shows the need to keep cancer, especially bony metastasis, in the differential, particularly in the primary care setting.

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