Hypertrophic Osteoarthropathy as a Clinical Manifestation of Lung Cancer

Melissa C. Davis, RN, MSN, OCN®, ANP, and Victoria Sherry, MSN, CRNP, AOCNP®

Hypertrophic osteoarthropathy is a paraneoplastic syndrome most often found in non-small cell lung cancer. Diagnosis is confirmed by the presence of clubbing on physical examination and periostitis on bone scintigram, and the syndrome generally resolves with treatment of the underlying malignancy. This article presents a case study and describes symptom management options, including nonsteroidal anti-inflammatory agents, octreotide, and bisphosphonates.

J.C., a 69-year-old African American man with a 30-pack-year smoking history, had no significant past medical issues. In August 2010, he initially noticed bilateral lower extremity joint and bone pain. Within three months, the pain became so severe that J.C. could not get out of bed. He presented to his primary care provider with generalized weakness, marked clubbing in his fingers and toes, swelling at the ankles and knees bilaterally, bilateral tibial tenderness, a 30-pound weight loss over a six-month period, profound fatigue, depression, dyspnea on exertion, and a dry cough. Diagnostic tests included a bone scintigram showing periosteal proliferation in the shafts of the tibiae, femurs, and radii bilaterally, and a chest x-ray, which identified a left upper lobe mass. A computed tomography scan of the chest confirmed a 9.3 x 9 cm left upper lobe mass with endobronchial extension into the left upper lobe mainstem bronchus and prominent mediastinal lymph nodes. Transbronchial biopsy of the left upper lobe revealed a poorly differentiated squamous cell carcinoma. Staging work-up with a positron-emission tomography scan and brain magnetic resonance imaging were negative for metastases.

Based on those findings, J.C. was diagnosed with T3N2M0, stage IIIA non-small cell lung cancer with the paraneoplastic syndrome of hypertrophic osteoarthropathy (HOA). His plan of care included surgical resection followed by adjuvant chemotherapy. However, because of J.C.'s poor performance status, he was not a surgical candidate and was treated with six cycles of induction chemotherapy consisting of carboplatin (area under the curve = 5, given on day 1 of a 21-day cycle) and paclitaxel (100 mg/m^2 given on days 1, 8, and 15 of a 21-day cycle). By the end of the first cycle, J.C.'s pain had completely resolved. He was no longer confined to bed and was able to walk a mile without difficulty. In addition, his clubbing had started to resolve.

Hypertrophic Osteoarthropathy

Paraneoplastic syndromes are rare, heterogeneous disorders that are triggered by cancer or its metastases. Although the etiology is not well understood, symptoms may result from hormones or cytokines released by the tumor, or from the body's immune response to the tumor. Symptoms occur distant from the neoplasm and can affect almost any system of the body. HOA is one type of paraneoplastic syndrome, characterized by abnormal proliferation of the cutaneous and osseous tissues at the distal parts of the extremities (King & Nelson, 2008). The triad of clinical signs and symptoms includes clubbing, periostitis (inflammation of the connective tissue surrounding the bone), and symmetric polyarthritis (Cosar-Alas et al., 2007; Yao, Altman, & Brahn, 2009).

HOA is classified as either a primary or secondary disease. Primary HOA, also called pachydermoperiostosis, is a rare autosomal dominant disorder. Secondary HOA is more common and can be caused by pulmonary malignancy, chronic respiratory diseases, congenital cyanotic heart disease, chronic inflammation, or hepatic, gastrointestinal, and endocrine disorders (Moralidis et al., 2010). Pulmonary malignancy accounts for more than 80% of secondary HOA cases (Yao et al., 2009). Nonetheless, the incidence of HOA is rare, occurring in 0.7%–4.5% of lung cancers, most often non-small cell lung cancer (Ito et al., 2010; Izumi, Takayama, Yabuuchi, Abe, & Nakanishi, 2010; Yao et al., 2009). HOA may occur prior to the symptoms of the primary malignancy, or it may develop with disease progression (Ito et al., 2010).

Melissa C. Davis, RN, MSN, OCN®, ANP, is a hematology/oncology nurse practitioner at Dartmouth-Hitchcock Medical Center in Lebanon, NH, and Victoria Sherry, MSN, CRNP, AOCNP®, is a nurse practitioner in the Perelman Center for Advanced Medicine at Abramson Cancer Center at the University of Pennsylvania in Philadelphia. The authors take full responsibility for the content of the article. The authors did not receive honoraria for this work. No financial relationships relevant to the content of this article have been disclosed by the authors or editorial staff.

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