Lung Adenocarcinoma Presenting as Worsening of Chronic Neck Pain—A Cautionary Tale

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ABSTRACT

INTRODUCTION: Neck pain is a common musculoskeletal problem that up to 70% of the world population will experience at some point in their lives. Intramedullary spinal cord metastasis is an exceedingly rare complication of malignancy that affects less than 1% of all patients with cancer.

CASE REPORT: We report a case of a 61-year-old man who presented to primary care clinic with 1-month history of worsening neck pain with associated neurologic deficits. Despite initial conservative management, the patient continued to have progressive worsening of sensory and motor deficits. Magnetic resonance imaging of the cervical spine showed vasogenic edema of the brain and spinal cord and nodularity at the C4-C5 level. A computed tomography of the chest showed a dense lesion in the left lower lobe of the lung; histopathology of the biopsied specimen was consistent with moderately differentiated lung adenocarcinoma.

CONCLUSIONS: A high index of suspicion is necessary when chronic neck pain acutely worsens, changes in character, or is accompanied by neurologic deficits. These clinical signs warrant further investigation into a secondary cause of neck pain. Intramedullary spinal cord metastases are rare complications of systemic malignancies that commonly present with neck pain and upper extremity paraesthesias; early diagnosis and management are necessary to prevent complications such as spinal cord hemisection syndrome or spinal cord transection.

KEYWORDS: intramedullary spinal cord metastasis, lung cancer, lung neoplasm, lung adenocarcinoma, neck pain, spinal cord compression

Introduction

Neck pain is a common musculoskeletal problem that up to 70% of the world population will experience at some point in their lives.1,2 Chronic neck pain is defined as pain in the posterior cervical region that has been present for at least 3 months.2 In most cases, no specific cause of neck pain is identified, and pain is managed with modalities including opioid medications and epidural injections.3 There are, however, certain situations in which the cause of pain must be investigated. Signs of spinal cord involvement as evidenced by paraesthesias and motor deficits warrant further imaging.

This report discusses a 61-year-old man who presented with acute worsening of his chronic neck pain and was ultimately diagnosed with stage IV moderately differentiated adenocarcinoma of the lung.

Case Report

A 61-year-old man with a medical history of chronic neck and back pain secondary to a motor vehicle accident presented to the clinic with a 1-month history of worsening neck pain. The x-ray of the cervical spine showed evidence of degenerative disk disease, and he was prescribed hydrocodone. One week later, the patient returned with progressive worsening of pain associated with upper extremity weakness, decreased grip strength, numbness, and paraesthesias of bilateral upper extremities. Range of motion was impaired secondary to pain. Activities of daily living were reported to be severely limited as the patient was unable to dress or bathe himself without assistance. Social history was significant for a several year history of construction work and negative for tobacco or alcohol use. On examination, temperature was 36°C, blood pressure was 140/88 mm Hg, and pulse was 75 beats per minute. Point tenderness was noted on palpation of the cervical spine, and strength and range of motion testing were limited by severe pain.

Magnetic resonance imaging (MRI) of the cervical spine ordered by the primary care physician showed extensive vascogenic edema of the brain and spinal cord as well as a single nodular lesion at the C4-C5 level (Figure 1). The patient was subsequently admitted to the hospital and had an MRI of the brain, cervical, thoracic, and lumbar spinal cord. Imaging revealed innumerable ring-enhancing lesions throughout both cerebral hemispheres, basal ganglia, and cerebellum concerning for metastases. There was also evidence of a 6 mm × 14 mm × 9 mm-enhancing nodule in the right lateral ventral spinal cord at the level of C4-C5. No other spinal cord lesions were noted.
Computed tomography (CT) of the chest, abdomen, and pelvis was ordered, revealing a dense consolidation of the left lower lobe (Figure 2). Other CT findings concerning for metastases included mediastinal and periportal lymphadenopathy, a low-density lesion in the posterior spleen, and a nonspecific small sclerotic lesion of the left iliac bone. Although there was initially concern for an infectious process, blood cultures and infectious workup were negative. Transbronchial biopsy of the lesion confirmed the presence of a moderately differentiated adenocarcinoma of the lung with evidence of lymphovascular invasion. In the setting of wide metastases noted on CT, the disease was found to be consistent with stage IV adenocarcinoma of the left lung.

Promptly after diagnosis, the patient was started on palliative whole brain radiation therapy and spinal radiation therapy. The tumor was found to be anaplastic lymphoma kinase (ALK) gene positive, and the patient was subsequently started on crizotinib, an oral tyrosine kinase inhibitor targeting ALK. Due to central nervous system (CNS) involvement, dexamethasone was initiated with plan for a long prednisone taper.

This patient’s disease course was complicated by steroid-induced psychosis and acute hypoxic respiratory failure which was believed to be multifactorial. He was found to have a left-sided pleural effusion for which a thoracentesis was performed. One liter of serosanguinous fluid was drained with cytology confirming a malignant effusion. Unfortunately, the patient experienced a prompt reaccumulation of loculated fluid, and his respiratory status continued to decline. He was ultimately discharged on home hospice.

**Discussion**

Intramedullary spinal cord metastasis (ISCM) is the rarest form of CNS complication of a systemic cancer. The most common primary malignancy leading to ISCM is lung cancer, with 47% of cases originating from primary lung cancers. The next most common primary malignancies giving rise to ISCM are breast cancer, melanoma, and lymphoma. Awareness of spinal cord metastasis as a potential cause of neck pain is important to aid in timely diagnosis and treatment.

Intramedullary spinal cord metastasis most commonly presents as neck pain and upper extremity paraesthesias. Symptoms quickly progress over the period of days to weeks, frequently resulting in cord hemisection syndrome (Brown-Séquard) or spinal cord transection. The worse the neurologic deficit is at time of symptom presentation, the worse the patient’s prognosis will be. Due to the rapid progression of neurologic deficits, early diagnosis is crucial.

There are several features that help differentiate neck pain secondary to spinal cord compression from degenerative joint disease (DJD). Specifically, metastatic spinal cord compression can occur at any level, whereas DJD is rarely seen outside of the cervical or lumbar spine. Furthermore, the pain associated with DJD is familiar to the patient and has been present intermittently over the span of years, whereas the pain of ISCM is commonly seen as a new pain or acute worsening of pain. It is important to pay attention to these differentiating signs as once the initial neurologic deficit is seen, it may rapidly progress to paralysis over the period of hours to days. Patients with symptoms concerning for cord compression should undergo immediate MRI, preferably within 1 day of symptom onset.

Magnetic resonance imaging is the imaging modality of choice in the diagnosis of ISCM. In this case, the patient’s primary care provider appropriately ordered an MRI for the initial workup, leading to the diagnosis of ISCM as the initial presentation of lung adenocarcinoma. Magnetic resonance imaging allows for accurate localization and differentiation between different types of spinal cord tumors. Signal intensity of the tumor on T2-weighted images helps to differentiate between neoplastic and nonneoplastic lesions; more specifically, signal patterns can suggest specific diagnoses within these broad
categories. Alternatively, although CT may provide evidence that there is spinal cord enlargement or presence of a tumor, it cannot delineate the cause.

Metastatic spinal cord compression is an oncologic emergency; early diagnosis is important to prevent neurologic decline. The initial treatment of choice is radiation, in addition to glucocorticoids, with the goal of minimizing pain and preserving or restoring neurologic function. Indications for neurosurgical intervention are failed radiotherapy, radioresistant tumor types, or rapidly evolving neurologic symptoms.

Conclusions
A high index of suspicion is necessary when chronic neck pain acutely worsens, changes in character, or is accompanied by neurologic deficits. These clinical signs warrant further investigation into a secondary cause of neck pain. Intramedullary spinal cord metastases are rare complications of systemic cancer that commonly present with neck pain and upper extremity paraesthesias; early diagnosis and management are necessary to prevent complications such as spinal cord hemisection syndrome or spinal cord transection.

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