



CASE REPORT

Metastatic Lung Cancer Metastasis to Pericardium, Pleura, and Soft Tissue: A Multi-Specialty Conundrum

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Abstract

Lung cancer is a common type of malignancy and has the highest mortality rate among all cancer-related deaths. Metastasis from primary lung cancer can occur to almost any organ, but the most common sites for metastasis include brain, liver, adrenal glands and bones. Metastasis to soft tissues is uncommon and has been rarely reported. In this case report, we describe an unusual presentation of lung cancer in a patient who presented with shortness of breath. He was found to have large pericardial and pleural effusions. An incidental finding of a firm, right-sided, painless subcostal mass was observed. The pericardial fluid showed was found to contain malignant cells and the soft tissue mass was positive for adenocarcinoma of lung origin. A multi-specialty approach to the diagnosis and treatment included internal medicine, cardiology, hematology-oncology, cardiothoracic surgery, interventional radiology, and palliative medicine. Treatment included surgical drainage of the pleural and pericardial effusions as well as resection of the chest wall lesion.

Introduction

Lung cancer is the second most common type of malignancy and can result in distal metastasis to almost any organ. Metastasis to soft tissue is defined as growth of cancer cells either in the skeletal muscles or the subcutaneous tissues that arises from a tumor elsewhere in the body. Such metastases are infrequently reported in literature. Usually, soft tissue metastases occur late in the course of the disease after primary malignancy has been diagnosed. However, in some rare cases, they have been reported to occur at the same time or even before the primary malignancy has been identified. Their presence should be suspected in the presence of a palpable mass that is either painful or asymptomatic. Due to this unusual presentation, a subcutaneous mass may be overlooked resulting in late diagnosis or incorrect staging of cancer, which leads to a delay in appropriate treatment.

Case Report

A 77-year old African American male with a past medical history of duodenal ulcer with GI bleed, osteoarthritis of shoulder joint was referred to the ED by his primary care physician due to persistent and worsening shortness of breath. On examination, he was found to be tachycardic and tachypnic. In addition, an incidental finding of a large right sided subcostal mass was observed-it was firm and painless. His chest X-ray showed significant bilateral pleural effusions and CT-chest showed a large pericardial effusion. In addition,

an infiltrative left hilar mass encasing the left pulmonary artery was seen. The CT scan also showed a 6.9 cm mass adjacent to and possibly arising from the right sixth costochondral cartilage (Figures 1 and 2).

The patient was admitted to ICU for close monitoring and was scheduled for a pleuro-pericardial window owing to his large and symptomatic effusions. After uneventful induction of general anesthesia, a small left anterior thoracotomy was made to enter left side of the chest and nearly three liters of serous pleural fluid was drained from the left pleural space. The pericardium was next identified and opened to relieve the pericardial effusion and approximately 500ml of serous pericardial fluid was drained. Both fluids were sent for cytologic analysis. A small piece of pericardium was collected for pathological analysis. Blake drains were placed in both the pericardial space and the left pleural space for further drainage.

The soft tissue mass was resected with a vertical incision over the right subcostal mass. The mass was clearly within the subcutaneous tissue allow for an excisional biopsy. The mass was removed in its entirety from its base at the costal margin. A firm, large, lobulated red-yellow mass measuring

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Figure 1: Cross-Section CT scan view showing right subcostal mass.



Figure 2: Saggital CT scan view showing right subcostal mass.

7x 6x 4 cm was removed along with samples of bone (Figure 3). Following removal of the mass, the remaining bony tissue appeared somewhat necrotic chest with possible invasion (Figure 4). The subcostal mass and samples of chest bone were sent to pathology for further analysis. The patient was taken to I.C.U in a stable condition and referred to hematology-oncology for a recommendation.

Postoperatively, the patient developed persistent metastatic pleural effusion. As such, the decision was made for



Figure 3: Intraoperative gross specimen of right subcostal soft tissue mass.



Figure 4: Intraoperative field with mass excised showing necrotic costochondral cartilage.

interventional radiology to place a tunneled intra-pleural drainage catheter (PleurX™; Carefusion, San Diego, CA). The pathologic diagnosis was stage 4-A cancer: evidence of bilateral hilar node involvement (N3), malignant pleural and pericardial effusions and costal mass showing evidence of adenocarcinoma of lung origin. He was referred to hematology-oncology and determined to be a poor candidate for systemic chemotherapy. Palliative medicine was consulted and hospice care arranged.

Discussion

Lung carcinoma is the leading cause of cancer-related deaths. Over 157,000 new cases and 142,000 deaths per year are caused by lung cancer in U.S.A alone [1]. Approximately 50% of the cases are metastatic at the time of presentation and up to 60% of the patients have microscopically or clinically evident metastasis at the time of primary tumor treatment. Lung cancer can metastasize to virtually any organ and post-mortem studies have shown prevalence of metastasis in up to 93% of lung cancer patients with end stage disease [1]. Lung carcinomas are most often in a metastatic stage IV when detected. They spread distally via either lymphatic or the blood vessels. Distant metastasis via lymphatic usually takes longer time in comparison to spread by blood vessels [2].

Major sites of metastases include the liver (33–40%), adrenal glands (18–38%), brain (15–43%), bone (19–33%), kidney (16–23%) and abdominal lymph nodes (29%) [3]. The soft tissues comprise 55% of the total body surface area but metastasis to soft tissues is rarely reported in literature. However, if present, they indicate advanced disease and point toward a grave prognosis.

One study was conducted at a large medical center over a 30-year period (1971–2000), which identified 7237 cases of soft tissue tumors out of which 118 cases were from metastases to soft tissues, mainly the skeletal muscle and the subcutaneous tissues. Most of them were a result of metastasis from internal organs followed by metastasis from malignant melanomas and sarcomas. The most commonly involved sites included abdominal wall, back, thigh, chest wall, and shoulder. In 27.11% of the cases the soft tissue mass was the initial manifestation, subsequently leading to identification of the primary cancer [4]. Another autopsy series has identified the prevalence of soft tissue metastasis in 0.5-9% of the patients dying from metastatic cancer [5].

The lung cancer is considered the most common primary carcinoma leading to clinically recognized soft tissue metastases, followed by kidney and colon cancers [1]. However, one study by Nguyen et al reviewing 500 patients with primary cancer reported that the overall prevalence of soft tissue metastases was 1.8% and metastases originating from melanomas were much higher than from primary lung cancer (9.8 vs. 2.3%) [5].

Metastases from lung cancer are macroscopically indistinguishable from metastases of other cancers and usually present as fast growing solitary or multiple nodules with a diameter ranging from 5 mm to 10 cm. These masses are usually firm, mobile and covered with a normal skin but exudative or ulcerative lesions can be present [6]. Pain is reported as the most frequent symptom (83%) and a mass is palpable in 78% of cases of ST metastases [7]. Other presentations may include a painless soft tissue lump, an asymptomatic mass noticed on trauma to the involved area or weight loss in a patient with no known tumor. Cutaneous manifestations are reported relatively more commonly than soft tissue metastasis with an incidence ranging from 1-12% [8].

When a soft tissue mass is found in patients with no known primary tumor, it may be mistaken as a soft tissue sarcoma

[9]. However, a painful mass is more commonly observed in patients with soft tissue metastasis than in primary sarcomas [10]. It is critically important to distinguish between a metastatic neoplasm and a primary soft-tissue tumor because the treatment and prognosis are markedly different.

In summary, a rare case of metastatic lung cancer to the pericardial and pleural spaces as well as the soft tissue was diagnosed and managed with multi-specialty clinicians: internal medicine, cardiology, hematology-oncology, cardiothoracic surgery, interventional radiology, and palliative medicine. Although the patient succumbed to his illness, the collaborative efforts were noteworthy.

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