

Vertebral Fractures Due to Metastatic Tumors: A Case Report

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Abstract- Metastasis is responsible for most cancer-related morbidity and mortality. In principle, metastasis is the spread of cancer from the primary site to distant tissues. Pathological consistency may be compromised during metastasis. We report the case of a 55-year-old man with MRI images of the dorsal spine showing the effects of a fifth dorsal collapse. He was referred to our hospital because of back pain, imbalance, inability to walk, and weakness of the lower limb. The histological features of bone tumors were corresponding with cell carcinoma, and bone damage was considered metastatic from a site in the lung. His general situation gently diminished, and He died during radiotherapy.

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Introduction

Vertebral compression fractures (VCF) can have a variety of factors, including neoplastic penetration, osteoporosis, or trauma. Osteoporotic compression fractures (VCF) in menopausal women are about 25%, and the rate of osteoporosis in older men the same age is lower (1). And trauma is the most common cause of the disease in young people less than 50-year-old. Although many cancers, such as breast, prostate, and lung, have a propensity to metastasize to bone, which can lead to malignant VCFs (2).

And research has shown that 9%-29% of patients suffering metastasis will have fractures, and 90% of Injuries and fractures require surgery. In addition, about 70% of patients with bone metastases due to lung cancer have bone pain (3-5).

It has also been proven that Cancer metastases generally occur in the thoracic or lumbar areas (6). The most prevalent type of lung cancer that accounts for one-third of all cancers is lung adenocarcinoma. However, few patients are asymptomatic in lung cancer and are diagnosed with para clinical and radiography imaging.

But most people with the disease are symptomatic (7). Metastases to lung cancer can occur in any organ,

but most metastases are to the adrenal glands, bone, liver, brain, and lymph nodes. However, almost one-third of people with lung cancer show symptoms of extrathoracic spread (8). However, bone metastases are not unusual in lung cancer, but osteoporosis has been extremely rare (7). Magnetic resonance imaging (MRI) using signal intensity is very useful in the precise determination of the cause of fractures associated with vertebral depressions (9). In this study, we report a case of pulmonary adenocarcinoma with bone metastases.

Case Report

A 55-year-old man was referred to Tovhid Hospital Emergency department in Sanandaj for the assessment of low back pain, imbalance, inability to walk, and weakness of the lower limb. The patient had been referred to various medical centers several times, and no significant diagnosis was given due to the absence of any specific trauma or medical history. Two weeks before admission, the patient had an MRI of the lumbar spine and brain, which there were no reports of abnormalities. Also, the laboratory data, such as Routine hematological, serum chemistry tests, and urine tests, yielded normal results. The patient had a weight loss of

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about 5 to 6 kg over a period of 2 months. He was also a non-smoker and had no previous medical illness and no pulmonary symptoms. While in the hospital emergency department, a full series of blood and urine tests, as well as MRIs from the whole spine, were taken. Until the MRI report showed that the fifth dorsal vertebra was completely disintegrated and so that the top and bottom discs of the fifth backbone are facing each other. And by entering the remains of this vertebra into the spinal canal the spinal cord in this area is severely damaged and provides conditions for lower-limb paralysis (Figure 1 & 2). Histological studies revealed metastatic squamous cell carcinoma. The patient has been transferred to the Tovhid Hospital Hemato-oncological Department for ancillary therapies and more accurate detection. Chemotherapy and radiotherapy treatment for lung cancer was added into the treatment, but unfortunately, the patient died due to the patient's intolerance to the severity of the disease.

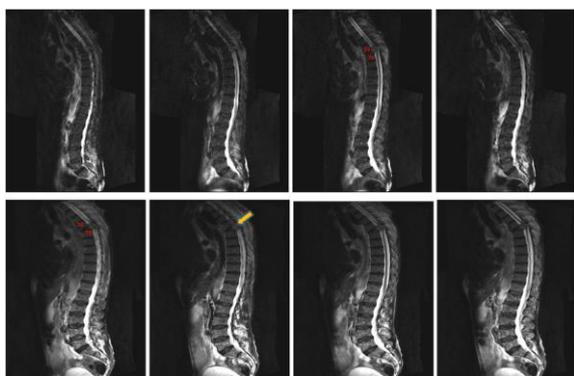


Figure 1. Magnetic resonance imaging Sagittal images without the contrast of the vertebral Sagittal without contrast Sagittal revealing an exposed vertebral compression fracture. The fifth thoracic vertebra (yellow arrow), the fourth dorsal vertebra (T4), and Sixth thoracic vertebra (T6)

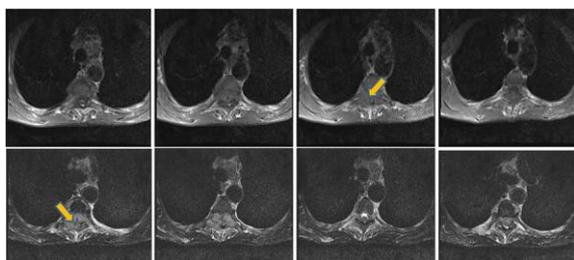


Figure 2. Magnetic resonance imaging Axial images without the contrast of the vertebral Sagittal without contrast axial revealing an exposed vertebral compression fracture. The fifth thoracic vertebra (yellow arrow), the fourth dorsal vertebra (T4), and Sixth thoracic vertebra (T6)

Discussion

The cause of low back pain varies, and vertebral fractures can be detected by history and Radiology and MRI images. A decrease in bone marrow density and a decrease in bone transparency, which is one of the contributing factors to osteoporosis, can also be detected by imaging. In addition, metastasis-induced fractures are detectable through heterogeneous lesions and uncertain borders in radiological images. Usual bone growth and keeping Becomes stable by moderate communication between osteoclasts and osteoblasts (10). Bone metastases generally disrupt the balance of both types of osteoblast and osteoclast cells and are a general health difficulty due to the increased occurrence of cancer at 3.2 million per year (11). Studies have also shown that breast and lung cancer is the most common cause of bone damage (12).

In our case, we also did some research on lung cancer. However, the data were all within the normal range. But using ultrasound and CT imaging made it clear to us that lung cancer was present.

One of the main types of lung cancers in pulmonary adenocarcinoma, which metastasis is not rare in this type of cancer. Studies have shown that about 30 to 40 percent of patients with advanced lung cancer develop bone metastasis. In fact, research has shown that, as the number of lung cancer residues increases, the number of people alive with bone metastases is also growing (13,14). Metastases through the osteolytic (bone resorption) and osteoblastic (bone-forming tumors) cells produce metastatic bone damages. The third category of damages is clinically obvious in which a blend of the two phenotypes is seen (15). Osteolytic bone metastases are an outcome of tumor-induced activation of Osteolytic bone matrix resorption. Absorption of mineralized bone matrix is the Intrinsic activity of osteoclasts, a Multicellular of hematopoietic origin inhabiting in the bone. Research has also shown that interleukin and chemokine ligand can induce pioneers to tolerate osteoclastogenesis through a receiver activator of NF-kappaB ligand (RANKL)/RANK-autonomous mechanism (7).

Radiotherapy is the best and standard treatment for bone metastases. Also, Pain can be treated with medication but with significant side effects. In addition, the course of treatment is time-consuming for the patient, physician, and nurse. Radiotherapy is a viable solution for treatment but with restrictions such as non-response, poor tissue formation (16). Today, computerized tomography (CT) scan and Magnetic resonance imaging (MRI) has revolutionized the

diagnosis of diseases and lesions (17).

We report a rare case that reported severe low back pain caused by bone metastasis from lung cancer, which resulted in lung cancer metastasis leading to complete disintegration of the fifth thoracic vertebra.

Ethical Approval and Consent to Participate

This research has been confirmed by the Research Center of Kurdistan University of Medical Sciences and Ethics Committee with the file number IR.MUK.REC.1399.085.

Consent for Publication

Written informed consent was obtained from a legally authorized representative(s) for anonymized patient information to be published in this article which was approved by the Research Center of Kurdistan University of Medical Sciences.

Competing Interests

All authors declare that there is no conflict of interest that prejudices the impartiality of this scientific work.

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