Skeletal muscle metastasis: an unusual manifestation of adenocarcinoma of lung

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Abstract

Introduction: Lung carcinoma is the most common malignancy in adults and the leading cause of death globally. It is responsible for 25% of all malignancy-related death worldwide. Among various types of lung carcinoma, adenocarcinoma is the most common (50%) of all the variants. Lung adenocarcinoma metastasising to skeletal muscle is rare in clinical practice.

Case report: A 53-year-old male patient presented with complaints of swelling over left arm of size 5x4 centimetres which was irregular in shape, soft to hard in consistency and gradually increasing in size. He was symptomatically treated but there was no improvement in clinical condition. In due course of time, patient presented with cough with expectoration. On general physical examination, pulse rate was eighty beats per minute, blood pressure 120/80 mm of Hg, respiratory rate eighteen cycles per minute. On systemic examination, respiratory system revealed bilateral normal vesicular breath sounds, cardiovascular, abdominal and neurological systems were clinically within normal limits. Panel of investigations were done as a part of work up, inclusive of ultrasonography and magnetic resonance imaging of left arm, computerized tomography of chest, fine needle aspiration cytology and positron emission tomography scan which concluded adenocarcinoma of right lung with left triceps muscle metastasis.

Conclusion: Though the metastasis of adenocarcinoma lung is a common, metastasis to the skeletal muscle is not so well-known. A clinical suspicion about such pathology, can help a clinician to arrive at right diagnosis on time. Hence this case report emphasizes that even a trivial swelling in triceps muscle could be hiding the grave adenocarcinoma in the lung.

Introduction

Lung carcinoma, the most common malignancy worldwide, presents as a metastatic disease in majority of the cases. The most frequent sites of distant metastases are liver, adrenal glands, bones, and brain. Skeletal muscle metastasis is an unusual presentation of lung adenocarcinoma.

Case Report

A 53-year old male patient, labourer by occupation, beedi smoker since twenty five years, admitted to tertiary care hospital with pain and swelling over left arm, cough and expectoration since two months, accompanied with significant weight loss. There was no evidence of chest pain or hemoptysis. On local examination there was hard swelling over extensor compartment of left upper limb with mild tenderness, no loss of sensation and mild restriction of range of movements on flexion at elbow. Respiratory and other systemic examination was within normal results. Computerized tomography of thorax plain defined multilobulated lesion in right perihilar location in right middle lobe (Fig.1). Ultrasonography of left arm showed an irregular heterogenous soft tissue lesion noted within the triceps muscle with few areas of intra-lesional necrosis, Magnetic resonance imaging of left arm showed lobulated lesion in posteromedial aspect of mid and distal arm, involving triceps muscle, medial aspect of brachialis, encasing brachial artery, veins and median nerve (Fig.2). Positron emission tomography showed enhancing nodular soft tissue lesion noted in middle lobe of right lung, 2.9 x 2.4 centimetres. Biopsy revealed metastatic adenocarcinoma. For further studies Immunophenotyping was done which showed negative for EGFR and ALK. Patient was treated with palliative RT, Pem-Carbo f/b Pemtrexed maintenance and recently 3# of Gemcitabine. The patient died of metastasis to brain within eight weeks of diagnosis.

Discussion

Lung carcinoma is a leading cause of cancer-related mortality. The most common sites of distant metastasis in lung carcinoma are brain , bones , the liver , and the adrenal gland [1]. Skeletal muscle metastasis of lung carcinoma was first reported by Fisher et al. [2]. Willis RA, reported four skeletal muscle metastases in their autopsy series composed of 500 lung carcinoma patients [3]. Skeletal muscle metastasis is a rare occurrence for any tumour with a reported incidence <1% [4],[5]. The most common tumours that cause skeletal muscle metastasis are tumours originating from thyroid, oesophagus, stomach, pancreas, colon, rectum, bladder, breast, ovary, and prostate [2]. The most common sites of muscle metastasis are thigh muscles, iliopsoas, and paraspinous muscles [6].

The mechanism of skeletal muscle metastasis is unclear. Despite its rich vascular blood supply and a large mass in the body, it is resistant to haematogenous metastases. Organs that are frequently metastasized, including liver, lung, and bone have rich capillary networks and blood supply. As a result of the muscle metabolism, substances such as lactic acid, free oxygen radicals, and low pH in the environment constitute an infertile medium for proliferating tumour cells. In addition, mechanical insults due to contractions, high tissue pressure, and widely alternating blood flow are also against the survival of tumour cells [7].

There are several hypotheses proposed for skeletal muscle metastasis in lung carcinoma. The most widely accepted hypothesis is the haematogenous route. In this hypothesis, it is believed that tumour cells are formed through tumour embolism. Some authors suggested that skeletal muscle metastases might originate from abnormal lymph nodes found in the muscle. In a study by Bocchino, et al. [8]. 1754 lung carcinoma patients treated between 2007 and 2012 were analyzed and forty six (2.6%) had skeletal muscle metastasis. Despite the variations between different studies in terms of the association between histological subtypes and skeletal muscle metastasis, forty patients in that study (87%) had non small cell lung carcinoma and six had (13%) small cell lung carcinoma. Among non small cell lung carcinoma patients, twenty four (60%) had adenocarcinoma. The most common initial manifestation of skeletal muscle metastasis is a pain. Pain can be accompanied by extremity swelling. The case presented herein also applied with pain and swelling. Diagnostic methods for skeletal muscle metastasis are not specific. Direct films usually show only soft tissue shadows. Magnetic resonance imaging usually reveals hypointense signal in T1 and hyperintense signal in T2. Magnetic resonance imaging is preferred to distinguish soft tissue metastasis from an abscess, sarcoma, and other conditions [9] similarly, our patient had hypointense signal on T1 and the hyperintense signal on T2 series. The optimum treatment and prognosis of skeletal muscle metastasis from lung cancer is unclear. Depending on the clinical characteristics, treatment options include observation, surgery, chemotherapy and radiotherapy.

Conclusion

Lung carcinoma with skeletal muscle metastasis should be considered as a potential differential diagnosis in patients presenting with intramuscular mass.

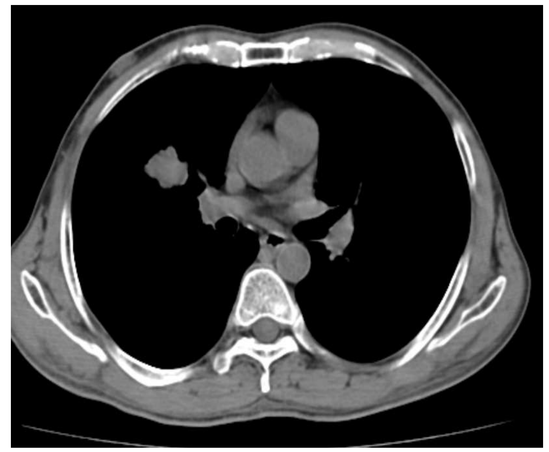


Figure 1. Computerized Tomography of Thorax: Well defined multi-lobulated lesion in right perihilar location in right middle lobe measuring 2.9 x 2.4 cm.

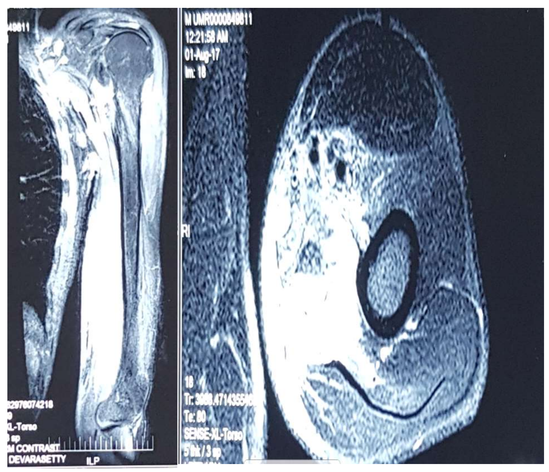


Figure 2. Magnetic Resonance Imaging of Left arm: Well defined irregular lobulated enhancing T1 hypo intense, T2 and T2 flair hyperintense lesion in the posteromedial aspect of mid and distal arm..

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