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# A complicated case of lung cancer and pulmonary tuberculosis initially presented with painful scapular metastasis in other side

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**Abstract** We report a 43-year-old man who presented with a right painful shoulder mass and bilateral lung masses in computed tomography (CT). Scapular mass was excised and pathology report demonstrated high-grade metastatic tumor. Same side lung biopsy and histopathological study characterized tuberculosis but biopsy of the left lung lesion identified adenocarcinoma of the lung. The final diagnosis was right scapular metastatic lesion from left lung adenocarcinoma. Musculoskeletal symptoms are commonly encountered in lung malignancies due to paraneoplastic syndrome or hematogenous metastasis but scapular metastasis on the other side as the presentation of lung cancer is extremely rare.

**Key words** lung cancer (LC); scapula; tuberculosis; metastasis; adenocarcinoma

Lung cancer (LC) is one of the most deadly and the most common malignancies worldwide for both women and men, causing nearly 1.2 million deaths per year <sup>[1]</sup>. Patients with LC frequently have advanced disease when the diagnosis is confirmed, usually because of the aggressive biology of the malignant cells <sup>[2]</sup>. There are a wide range of clinical presentations of the LC. Clinical presentations may be due to regional or distant spread (hematogenous or lymphatic metastasis) or from paraneoplastic syndromes. The most common of clinical symptoms are ambiguous and nearly seventy-five percents out of patients have one or more manifestations at the time of diagnosis <sup>[3]</sup>.

Lung cancer can metastasize to different organs such as the liver, brain, adrenal glands and bone which it is commonly symptomatic. Pain (especially persistent) in the chest, back, or limb is commonly seen in patients who have bone metastasis (BM). Vertebrae, ribs, ileum and sacrum are the earliest bones that are affected by metastasis of LC whereas; the skull, femur, humerus, and scapula are involved later <sup>[4, 5]</sup>. Also, BM due to other origin such as breast, prostate, thyroid and kidney malignancy is common but scapular metastasis is rare <sup>[6]</sup>.

The BM symptoms are ambiguous and may be forced the patients with previously recognized or yet not to be recognized malignancy to seek symptomatic therapy. Finally, due to the severity of the symptoms or a physical disability or deformity, the patient had to visit a doctor as serious medical conditions. We report a patient with previously undiagnosed lung cancer presenting with scapular metastatic mass in other side with background of pulmonary tuberculosis.

## Case report

A 43-year-old man with a painful mass in the right shoulder was referred for further evaluation. The mass increased in size and became painful gradually over a four-month period. Additional symptoms included mild shortness of breath and dyspnea and weight loss (8 kg during 4 months). The patient had past medical history of a traumatic tibia fracture reconstructed by surgery and simple thyroid cyst resection 23 years ago. He reported cigarette smoking as amount of 20 packs/years. He was a military employee but did not have history of chemical weapon exposure.

Physical examination disclosed spherical mass of about five centimeters diameter which was located in inferior

angle of right scapula (Fig. 1). The bulging was firm, tender to palpation, but it did not restrict shoulder and arm movement. Other clinical findings were right axillary lymph nodes; bilateral pulmonary rhonchus with right priority. His spleen and liver were not felt and vital signs were stable.

He had mild anemia (hemoglobin: 10.9, mean corpuscular volume: 71), but other laboratory findings were normal. Chest X-ray showed an osteolytic lesion in the lateral border of the right scapula and round opacities in the left and right lung. Chest computed tomography (CT) scan confirmed the osteolytic lesion in the right scapula and also revealed a small mass with central cavity in upper lobe of right lung and a nodule in upper lobe of left lung with bilateral hilar lymph nodes enlargement (Fig. 2).

Other evaluations (sputum smear and culture) revealed the pulmonary tuberculosis and the patient treated by four-drug regimen. Scapular mass biopsy showed high-grade undifferentiated adenocarcinoma. The patient underwent right scapular mass resection. From same incision, right axillary lymph nodes excision and wedge biopsy of the nodule in lung were performed.

The histopathology report of hematoxylin and eosin staining showed: (1) Right scapular mass: pleomorphic high grade metastatic tumor compatible with adenocarcinoma. (2) Right axillary lymph nodes: reactive lymph nodes and negative for malignancy. (3) Right lung, wedge biopsy: chronic granulomatous inflammation compatible with tuberculosis.

In the immunohistochemical assessment, the Carcino-Embryonic Antigen (CEA), CytoKeratin-7 and CytoKeratin-20 were expressed, while other tumor markers were negative.

CT guided biopsy was carried out from the apical lesion of the left lung, histological examination of which identified adenocarcinoma of the lung. The final diagnosis was right scapular metastatic lesion from left lung adenocarcinoma in a background of tuberculosis. Finally, systemic chemotherapy was started and in follow-up visit after 5 months, the patient did not have other metastatic lesion and his medical condition was stable.

## Discussion

Musculoskeletal symptoms are commonly encountered in lung malignancies due to paraneoplastic syndrome, direct invasion or hematogenous metastasis. BM from the LC may take place early in the clinical course and are commonly found to exist with a painful lesion [7]. Tsuya *et al* investigated BM in patient with non-small cell lung cancer; the prevalence of BM was 30.4% during clinical course of the disease and two patients (2.9%) out of all 70 patients had scapular involvement [4].



Fig. 1 Scapular mass in gross schema

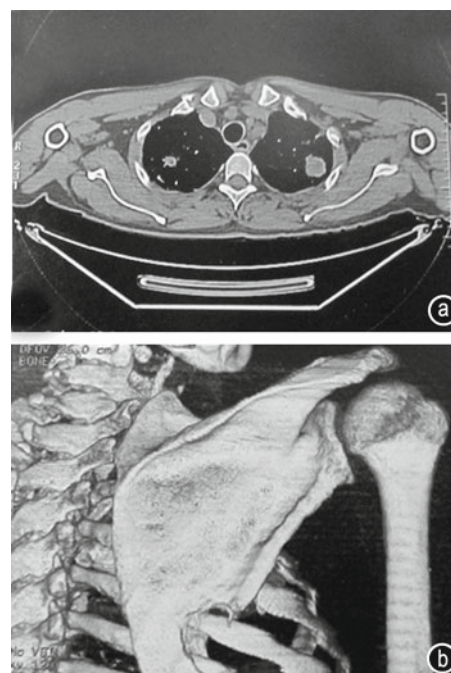


Fig. 2 (a) Lung lesions in chest computed tomography (CT); (b) Scapular lesion in CT scan with three dimensional (3D) reconstructions

Hanagiri *et al* followed 177 patients who underwent lung surgery due to LC. They reported fourteen cases with bone metastasis with one of them having scapular involvement [8]. Many patients with advanced LC have BM accomplished with skeletal and muscular related events, such as pain, pathological fracture, spinal instability, cord compression, and hypercalcemia whereas mass formation is uncommon and occurs with delay [4]. Demetrious *et al* reported a case who complained of shoulder pain initially and was diagnosed with malignant lesion of the scapula that had metastasized from the lung; however it was on the same side [9]. Choi *et al* reported a patient with known adenocarcinoma of the right lung that had been suffering metastatic bone pain of the left scapula and was alleviated

with scapuoplasty [10].

Naturally, the recognition of primary or secondary metastatic cancer needs attentive consideration with regard to history and physical examination. The physician should be considering red flags as the diagnostic clues. When primary malignancy is not yet recognized, metastatic spread to bone can at times be difficult to diagnose [9].

Nearly one-fifth of patients with non-small cell lung cancer have BM on presentation [11]. An osteolytic radiographic appearance is more frequent than an osteoblastic one. BM are even more frequent in small cell lung cancer and may be discovered in 30%–40% of patients [12]. The most common bones involved are the vertebrae, femur, pelvis and ribs. Overall, extensive BM should be considered in high risk patients for unidentified cancer who have elevated serum calcium and alkaline phosphatase levels [4].

Incidence and prevalence of lung cancer has risen incredibly and it should be considered in high risk patients such as smokers. BM is a consequential concern in patient with LC and it can deteriorate the quality of life or shorten survival [13, 14]. Although, adenocarcinoma is the predominant histological subtype of lung carcinoma in many countries; however, scapular metastasis on the other side as the first presentation of lung cancer is extremely rare, especially in the presence of pulmonary tuberculosis [15]. We recommend further lung evaluation for primary cancer origin in every patient with suspected metastatic bone lesions, although other conditions such as tuberculosis may exist.

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### Conflict of interest statement

Mohebbi Hassan-Ali and other co-authors have no conflict of interest.

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