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Unusual presentation of metastatic lung cancer in gluteal muscle: A case report

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ABSTRACT

Globally, lung cancer is a main cause of cancer-related mortality and morbidity related to cancer. Unfortunately, most cases are not detected and treated until the late stages of disease progression, and 50% of the patients present with established distant metastases. Common locations of distant metastases include the brain, bones, adrenal glands, and liver. However, metastasis to soft tissue, including skeletal muscles, is rare. In this case, we reported a rare presentation of gluteal muscle metastasis as the first complaint of primary adenocarcinoma of the lung in a 79-year-old man. Ultrasound revealed a right gluteal mass that raised the suspicion of an underlying occult malignancy. A histopathological evaluation also showed poorly differentiated adenocarcinoma (Immunophenotype: CK7+/TTF-1+/CK20-), favoring primary lung origin. Although soft tissue metastasis is a relatively rare site of distant spread, our case report underscores the need for a higher clinical sense and a lower threshold for biopsy, as these lesions might indicate an underlying hidden malignancy.

Keywords: Lung cancer; Gluteal mass; Metastasis; Skeletal muscles.

INTRODUCTION

Lung carcinoma is a major cause of mortality in cancer patients [1]. By diagnosis, about 50% of patients with primary lung cancer are found to have metastasis [2]. Distant metastasis that occurs through the lymph and bloodstream is highly prevalent in the later stages of the disease [3]. The commonest sites of distant metastasis include the liver (33-40%) followed by adrenal glands (18-38%), brain (15- 43%), bone (19-33%), kidney (16-23%), and abdominal lymph nodes (29%) [4]. Metastasis in soft tissues, including muscles, is unusual [2]. The authors, in this case, the report described a male lung cancer patient who is 79 years old and presented with a right gluteal muscle metastasis as the initial complaint.

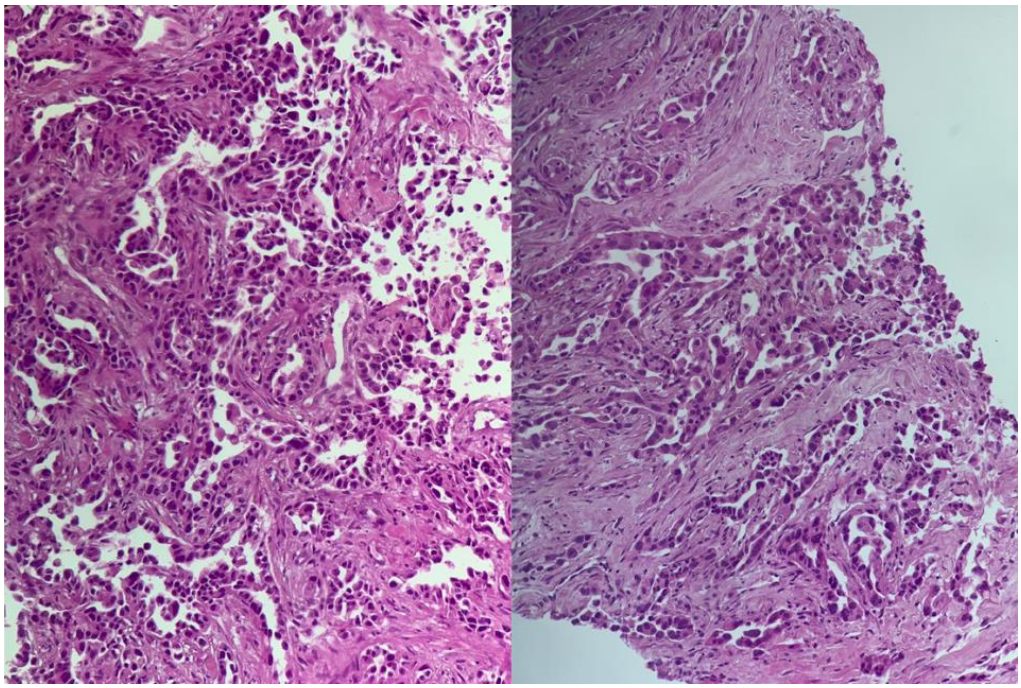
CASE PRESENTATION

A 79-year-old ex-smoker male patient initially came to our hospital for a true-cut biopsy of a right gluteal muscle mass. He had a 3-month history of discomfort and limping of the right lower limb, dizziness, headache, and blurred vision, after which he felt a lump in that area. The patient endorsed chronic dry cough but denied hemoptysis or chest pain. He did not lose weight or appetite. He had a history of smoking cigarettes every day for about 20 years, after which he stopped smoking for 10 years. The patient had no history of occupational or environmental carcinogen exposure, with a negative family history of cancer.

Upon examination, he had stable vital signs; blood pressure was 129/78 mmHg, heart rate was 82 beats/min, and a temperature of 37.5 ° C. Cardiovascular examination was unremarkable. Chest examination revealed clear bilateral lung sounds, with bilateral changes of gynecomastia, normal abdominal examination, without hepatosplenomegaly. Soft tissue nodules or enlarged lymph nodes were not appreciated. Initial laboratory investigations showed a white blood cell count of 8.7 x 10^3/µL, hemoglobin of 10.8 g/dL, and platelet count of 168 x 10^3/µL. The basic metabolic panel revealed serum sodium of 131 mEq/L, potassium of 3.95 mEq/L, blood urea nitrogen of 17 mg/dL, and creatinine levels of 0.87 mg/dL.

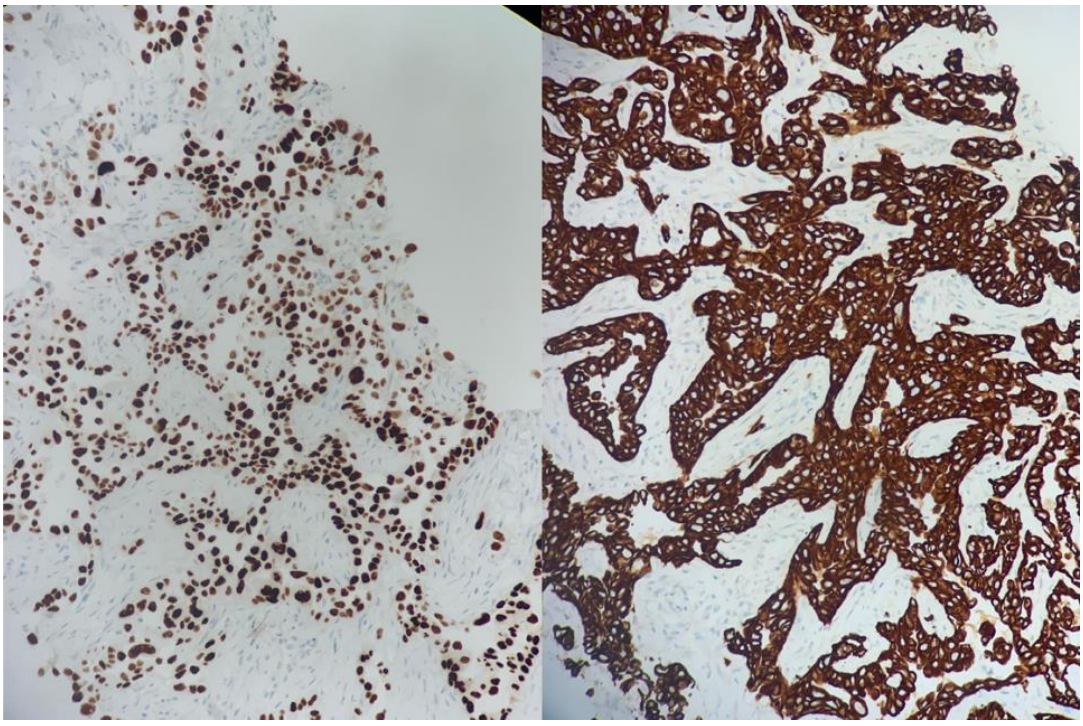
After a discussion with the patient about a tru-cut biopsy of the right gluteal region mass, the true-cut biopsy was taken under U.S. guidance with no immediate or delayed

complications. The samples were sent to our histopathology laboratory, which showed enlarged hyperchromatic cells with coarse chromatin and prominent nucleoli (Figure 1). Additionally, tumor cells were reported to be positive for cytokeratin-7 (CK7) and thyroid transcription factor 1 (TTF-1) but negative for cytokeratin-20 (CK20), consistent with lung adenocarcinoma (Figure 2).



(A) (B)

Figure (1): Gluteal mass biopsy showing a poorly differentiated tumor composed of hyperchromatic cells with coarse chromatin and prominent nucleoli (A and B).



(A) (B)

Figure (2): Immunohistochemistry showing tumor cells strongly immunoreactive to cytokeratin 7 (C.K. 7) (A) and thyroid transcription factor 1 (TTF1) (B).

After that, a discussion was made between the radiologist, pathologist, and his referral physician, and the decision was to perform a pan C.T. scan with IV contrast to look for the primary mass. A chest C.T. scan with IV contrast showed a large lobulated right soft lung tissue mass without calcifications or fat component, associated with prominent mediastinal lymph nodes (Figure 3). The abdomen/pelvis C.T. scan with IV contrast portal-venous phase showed a large lobulated right gluteal mass originating from the right gluteal muscles and extending into the right subcutaneous tissue—furthermore, some mildly enlarged retroperitoneal lymph nodes (Figure 4). The brain and neck C.T. scans were unremarkable.

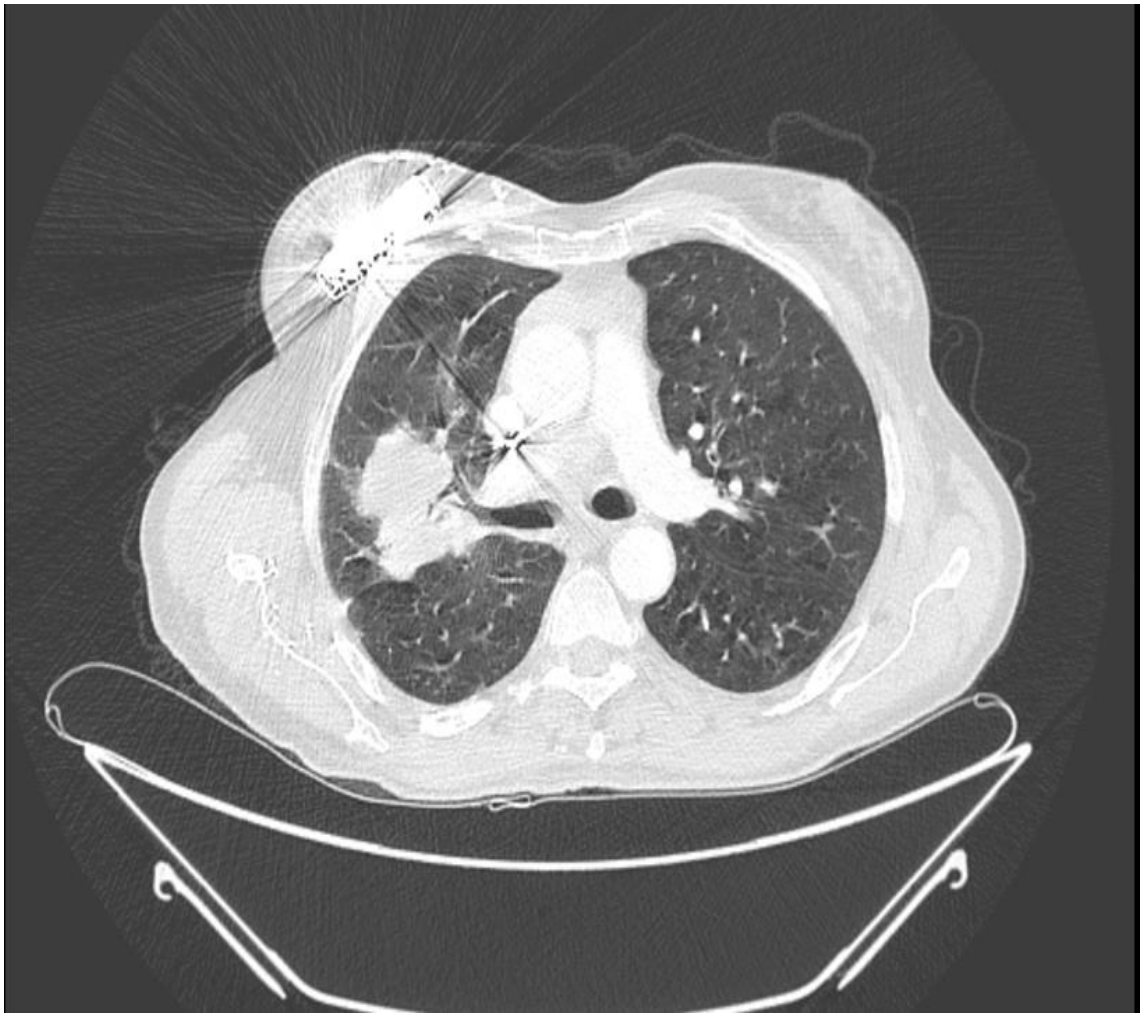


Figure (3): The chest C.T. / lung window with IV contrast shows a large lobulated soft tissue mass lesion with no calcifications or fat component associated with mildly enlarged mediastinal lymph nodes.

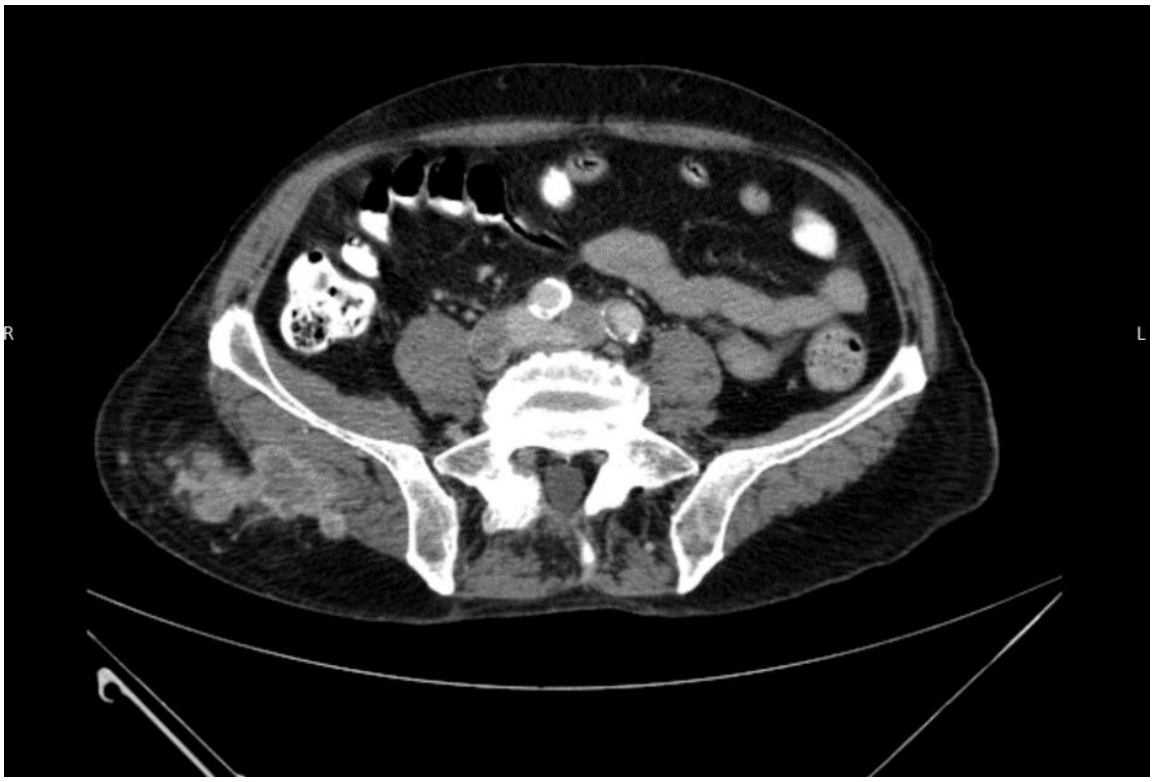


Figure (4): Abdomen/pelvis C.T. scan of the same patient with intravenous contrast portovenous phase shows a large lobulated right gluteal mass originating from the right gluteal muscles and extending to the right subcutaneous tissue, there are few mildly enlarged retroperitoneal lymph nodes.

DISCUSSION

The most prevalent symptoms reported in lung cancer patients are cough and hemoptysis. However, most cases are clinically silent and discovered only in the late stages with distant metastases [4]. Metastasis sites are influenced by age upon diagnosis, sex, and histology, with the most prevalent overall sites of metastasis being the nervous system and bone, followed by metastasis to the liver, respiratory tract, and adrenal glands. Liver and central nervous system metastases are the main sites in small cell lung carcinoma patients (incidence of 35% and 47%, respectively). In contrast, the main sites in adenocarcinoma are bone metastasis, which has an incidence of 39%, and metastasis to the respiratory system, with a reported incidence of 22% [5]. In general, carcinomas are most commonly metastasized through lymphatics first to regional lymph nodes; however, metastasis to soft tissues is very uncommon, having been reported to have an incidence of 1.4% in previous studies. The lung, kidney, and colon are the most common cancers resulting in soft tissue metastasis [6]. Studies among patients with lung cancer showed a prevalence rate of soft tissue metastasis of (1.3-4%) for skin metastases and (0-0.8%) for skeletal metastases [4]. A study by Salvatierra A, Baamonde C, Llamas JM, Cruz F, and Lopez-Pujol J reported that patients with adenocarcinoma and large cell neuroendocrine carcinoma were found to have an increased risk of soft tissue metastasis than those diagnosed with squamous cell carcinoma [7].

Several pathophysiological mechanisms for soft tissue metastasis have been proposed, of which the hematogenous spread is considered the most significant [8]. Pain and palpable mass have been reported to be the most frequent clinical manifestations of metastasis to soft tissues [9]. Soft tissue metastasis is most commonly observed in the back, abdomen, thigh muscles, chest wall, iliopsoas, and para-spinous muscles[4]. Primary sarcoma of the soft tissue, primary lymphomas of the muscle, and benign conditions like hemangiomas within the muscle, myxomas, and intramuscular ganglions are included as possible differentials in the diagnosis of soft tissue metastasis [4].

Physical examination and analysis of tumor markers are two diagnostic utilities. Our patient had no painful masses or clinically obvious soft tissue lesions suspicious of metastasis, and the tumor markers were negative. To determine the main origin, additional procedures such as immunohistochemistry were required. Expression of TTF-1, napsin-A, and CK7 proves primary lung origin. In a study involving 120 patients with primary lung adenocarcinoma, 79% were napsin A+/TTF-1+ve. 8% had TFF-1 / napsin-A +, and only 3% had TFF-1+/napsin-A–, concluding high sensitivity and specifying TTF-1 and napsin-A in detecting primary adenocarcinoma of the lung [7]. CK7 and CK20 were found to be of diagnostic significance in differentiating primary lung adenocarcinoma (CK7+/CK20-) from extrapulmonary adenocarcinoma of colonic origin (CK20+/CK7–) [10]. Another study showed that CK7 and TTF-1 were expressed in 100% and 80% of biopsies with primary lung adenocarcinoma [11]. The biopsy was CK7+/TTF-1+/CK20-, a panel strongly suggesting primary lung origin.

The impact therapy affects the patient's age, tumor stage, and histologic grade. Palliative radiation, chemotherapy, and immunotherapy are all alternatives for treatment. Prompt diagnosis increases survival chances.

CONCLUSIONS

As the first presentation, we described a rarely encountered case of primary adenocarcinoma of the lung presented as a right gluteal muscle soft tissue mass lesion. This reported case emphasizes the need to raise clinical suspicion and lower the biopsy threshold in patients presenting with lesions in the soft tissue, as it could represent a rare manifestation of occult malignancy. These lesions can also provide convenient and easily accessible biopsy sites that reduce the need for invasive procedures. Furthermore, our case report also highlights the importance of immunohistochemistry in diagnosing.

Ethics approval and consent to participate

The Institutional Review Board (IRB) of An-Najah National University has approved conducting and publishing the manuscript.

Consent for publication

Written consent was obtained from the patient. IRB was also obtained.

Availability of data and materials

The data sets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Authors' Contributions

MA and MM: wrote the manuscript. **MM and MS:** performed the histological examination and were major contributors to the writing of the manuscript. **MM:** performed the radiological examination and the true-cut biopsy. All authors approved the final manuscript.

Competing Interests

The authors declare that they have no competing interests.

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