Carcinoma Lung Presenting with Skeletal Muscle Metastasis: Case Report with Review of Literature

Ankit Lalchandani, MBBS, MS1 • Yogeshwar Shukla, MBBS, MS, DNB2
Mohammad Masoom Parwez, MBBS, MS1 • Vinay Kumar2

1 Department of General Surgery, All India Institute of Medical Sciences, Bhopal, Madhya Pradesh, India
2 Department of Surgical Oncology, All India Institute of Medical Sciences, Bhopal, Madhya Pradesh, India

Surg J (NY) 2021;7:e121–e123.

Address for correspondence Ankit Lalchandani, MBBS, MS, Department of General Surgery, All India Institute of Medical Sciences, Bhopal 462020, Madhya Pradesh, India (e-mail: akt91.lalchandani@gmail.com).

Lung cancer is one of the commonest cancers and cause of cancer-related deaths worldwide. Histopathologically, they are classified as small cell and nonsmall carcinomas, including variants such as squamous cell carcinoma, adenocarcinoma, and large cell carcinoma. It carries a poor prognosis as patients usually present in stage IV disease. However, skeletal muscle metastasis is infrequent, and this being the only presenting symptom is extremely rare. We present a case of a patient of primary adenocarcinoma of lung presenting with thigh muscle metastasis.

Case Summary

A 45-year-old female presented with complaint of pain over the right thigh with difficulty flexing the thigh for 12 months. Pain was nonradiating, and aggravated by brisk walking. Patient also complained of loss of appetite and weight but no history of fever, night sweats, or chronic cough. On examination, a vague mass was palpable over the anterior aspect of thigh that appeared to arise from the rectus femoris. There was no sensory or motor deficit. A magnetic resonance imaging (MRI) showed an ill-defined soft tissue mass (3.3 × 3 cm) with few hyperintense areas within, involving vastus intermedius muscle (► Fig. 1). An ultrasonography-guided biopsy was taken from the mass that showed metastatic deposits of moderately differentiated adenocarcinoma. On further evaluation for the primary, chest X-ray showed a mass lesion in right middle lobe causing collapse of right lower lobe. High-resolution computed tomography further showed a lesion with homogenous ground glass density with visible pulmonary vasculature suggestive of right lobar consolidation with subcentimetric lymph nodes in the pretracheal and paratracheal region (► Fig. 2). Computed tomography-guided biopsy taken from the lesion suggested invasive adenocarcinoma (moderately differentiated). She has been on chemotherapy since.

Discussion

Patients with lung cancer present in advanced stages with metastasis. They tend to metastasize both via lymphatics and hematogenous route. Metastases are increasingly seen in...
adenocarcinomas, whereas squamous cell carcinomas have a tendency to locally invade the thoracic wall. Major sites of metastasis are brain, bone, liver, and adrenals. Hematogenous metastasis to skeletal muscle is very rare, even in autopsy studies. Out of 500 autopsies conducted by Willis in carcinoma patients, only four were found to have skeletal muscle metastasis. Even the cancers, which commonly metastasize to the bone such as prostate, breast, and thyroid cancers, only rarely disseminate to soft tissues. According to one of the hypotheses, muscle contractions may prevent metastasis by inducing a high tissue pressure and variable local blood flow, thereby discouraging implantation of tumor cells. According to prior Wittich in 1854 provided the first description of a muscle metastasis and Willis was the first to report a muscle metastasis of lung origin. In their case series, Koike et al reported seven cases of carcinoma presenting with skeletal muscle metastases. Four of them were found to have pulmonary origin, of which two were adenocarcinomas and two squamous cell carcinomas.

In their review of 118 cases presenting with soft tissue metastasis, Jose Antonio et al identified 13 as having a primary tumor in the lung. Out of them 11 were adenocarcinomas and 2 had squamous cell histology. Upper trunk was the most frequent site for metastasis. Tuoheti et al published a clinicopathological study of 12 patients with skeletal muscle metastasis. Out of which four were of pulmonary origin. About 66% were metastasis to the lower limb. Baldeo et al have reported two patients who presented with lesions over the gluteal region and subscapular region, respectively. Initially referred to general surgeon by their primary
physician, they were subsequently found to have primary lung cancer.9

Pain is the most frequent symptom (83%), and a mass is palpable in 78% of cases of soft tissue metastases.10 Meta-
static soft tissue masses have high chance of misdiagnosis as the clinical features can mimic a sarcoma. Clinically meta-
static masses are painful, while sarcomas are present with painless enlarging masses. MRI and tissue biopsy would help
differentiate between the two. Positron emission tomogra-
phy scan can be of help in identifying any distant primary
tumor in case cross-sectional imaging is equivocal.

On MRI, soft tissue metastases are of low or intermediate
signal intensity compared with normal muscle tissue on T1-
weighted sequences and high signal intensity on T2-weight-
ed sequences, whereas soft tissue sarcomas have a heterog-

eous T2 signal intensities with peritumoral postcontrast
enhancement and the presence of necrotic areas.

Enhancement and the presence of necrotic areas.

References

1. Bricic L, Sherer CK, Shuai Y, Hornick JL, Chirieac LR, Dacic S. Morphologic and clinicopathologic features of lung squamous cell carcinomas expressing Sox2. Am J Clin Pathol 2012;138(05): 712–718

2. Willis RA. A review of five hundred consecutive cancer autopsies. Med J Aust 1941;2(10):258–265 cited 2019 Jul 12 [Internet] from https://onlineibrary.wiley.com/doi/abs/10.5694/j.1326-5377.1941.tb53986.x

3. Watmough P, Canty S, Higgins G, Paul A. Soft tissues metastases from malignant tumours. Orthop Proc 2005;87-B:2–3(SUPP_I); cited 2019 Jul 12 [Internet] from https://onlineboneandjoint.org.uk/doi/abs/10.1302/0301-620X.87SUPP_I.10870002e

4. Sridhar KS, Rao RK, Kunhardt B. Skeletal muscle metastases from lung cancer. Cancer 1987;59(08):1530–1534

5. Prior C. [Metastatic tumors in striated muscle: review and case report]. Riv Anat Patol Oncol 1953;6(04):543–560

6. Koike Y, Hatori M, Kokubun S. Skeletal muscle metastasis secondary to cancer–a report of seven cases. Ups J Med Sci 2005;110(01):75–83. cited 2019 Jul 12 [Internet]. Doi: 10.3109/2000-1967-183

7. Plaza JA, Perez-Montiel D, Mayerson J, Morrison C, Suster S. Metastases to soft tissue: a review of 118 cases over a 30-year period. Cancer 2008;112(01):193–203

8. Tuoheti Y, Okada K, Osanai T, et al. Skeletal muscle metastases of carcinoma: a clinicopathological study of 12 cases. Jpn J Clin Oncol 2004;34(04):210–214. cited 2021 Mar 18 [Internet], Doi: 10.1093/jjco/hyh036

9. Baldeo C, Ali R, Seeram V, House J. Lung cancer presenting as a soft-tissue metastasis. Case Rep Oncol 2015;8(01):185–188. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4427150/. cited 2021 Mar 18 [Internet]

10. Pop D, Nadeem AS, Venissac N, et al. Skeletal muscle metastasis from non-small cell lung cancer. J Thorac Oncol 2009;4(10):1236–1241

11. Crombé A, Marcellin P-J, Buy X, et al. Soft-tissue sarcomas: assessment of MRI features correlating with histologic grade and patient outcome. Radiology 2019;291(03):710–721. https://pubs.rsna.org/doi/full/10.1148/radiol.2019181659. cited 2021 Mar 18 [Internet]

12. Stojajić J Precise Diagnosis of Histological Type of Lung Carcinoma: The First Step in Personalized Therapy. Lung Cancer - Strategies for diagnosis and treatment - precise-diagnosis-of-histological-type-of-lung-carcinoma-the-first-step-in-personalized-therapy

13. Morrison BA. Soft tissue sarcomas of the extremities. Proc Bayl Univ Med Cent 2003;16(03):285–290. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1200782/ cited 2021 Mar 18 [Internet]

14. Damron TA, Heiner J. Distant soft tissue metastases: a series of 30 new patients and 91 cases from the literature. Ann Surg Oncol 2000;7(07):526–534

Conflict of Interest

None declared.

Acknowledgment

No financial support or assistance for received while creating this publication material.

Erratum: Article has been corrected as per Erratum (DOI: 10.1055/s-0043-1769507).