Received: 18 July 2021 | Accepted: 29 July 2021

DOI: 10.1111/1759-7714.14110

CASE IMAGE

WILEY

Lung adenocarcinoma presents with diffuse bone metastasis

Jinye Mi[1,2] | **Qinqin Xu**[3] | **Yongchang Zhang**[1,2]

[1]Graduate Collaborative Training Base of Hunan Cancer Hospital, Hengyang Medical School, University of South China, Hengyang, Hunan, China

[2]Department of Medical Oncology, Lung Cancer and Gastrointestinal Unit, Hunan Cancer Hospital/The Affiliated Cancer Hospital of Xiangya School of Medicine, Central South University, Changsha, China

[3]Department of Medical Oncology, Qinghai Provincial People's Hospital, Xining, China

Correspondence
Yongchang Zhang, Department of Medical Oncology, Lung Cancer and Gastrointestinal Unit, Hunan Cancer Hospital/The Affiliated Cancer Hospital of Xiangya School of Medicine, Central South University, Changsha 410013, China.
Email: zhangyongchang@csu.edu.cn

KEYWORDS: EGFR-TKI, lung cancer, metastasis

A 62-year-old man that smoked 15 packs a year presented to our hospital with 3-month persistent pain in the upper back. He had no cancer history, and the blood tests were unremarkable. Whole body positron emission tomography (PET) computed tomography (CT) scanning revealed a mass at the right lower lung lobe, enlargement of mediastinal lymph node, metastatic spread in the liver, and multiple bone metastasis throughout the body including the ribs, spine, pelvis, femur, and humerus. Interestingly, his PET-CT image demonstrated contrast in almost his entire skeletal system like a skeleton ghost (Figure 1).

A CT-guided biopsy was performed to obtain samples from the primary lung lesions and metastatic bone lesions. The histopathological diagnosis of both tissues demonstrated adenocarcinoma of lung origin, characterized by positive expression of TTF-1, CK7, and Napsin A and negative expression of

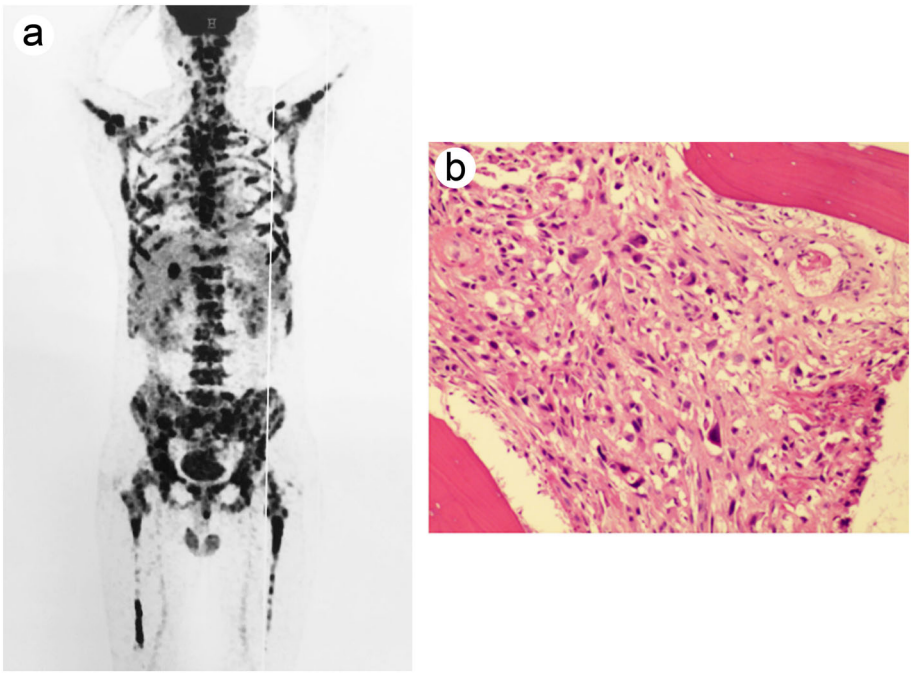

FIGURE 1 (a) Whole-body PET-CT illustrating the widespread metastasis of our patient. (b) Histology diagnosis of the bone metastasis

CgA, CD56, Syn, p40, and P63. Next-generation sequencing of blood and tissue samples revealed epidermal growth factor receptor (EGFR) exon 19 deletion. Based on previous examination, the patient was diagnosed with stage IV lung adenocarcinoma with diffused bone metastasis, which illustrated as a skeleton ghost from the PET-CT. Gefitinib (250 mg orally once daily) was initiated. Zoledronic acid was also administered to protect and strengthen the bones. After 2 months, a review of his chest CT at follow-up revealed significant tumor shrinkage evaluated as partial response and significant improvement in bone pain. Routine follow-up was carried out every 2 months with his response still ongoing for at least 12 months until the last follow-up on May 28, 2021.

For the diagnosis of widespread advanced lung cancer, it is important to perform a multiple lesions biopsy to avoid a second primary tumor. For poorly differentiated carcinoma or limited tissue sample size, immunochemistry should be performed to identify the histological type and orientation.[1] Based on molecular testing of lung cancer, many tyrosine kinase inhibitors including EGFR, ALK, ROS1, and MET prolong the survival time and improve the quality of life significantly.[2] For our adenocarcinoma patient who was detected with EGFR exon 19 deletion, osimertinib or gefitinib should be the potential options.[3,4] When the patient presents with progression disease, sub-sequential treatment strategies will be initialed through re-biopsy for resistance mechanism evaluation including histology transformation, by-pathway activation, and acquired driver mutations.[5]

CONFLICT OF INTEREST

The authors declare no conflicts of interests.

AUTHOR CONTRIBUTIONS

Yongchang Zhang collected the clinical data and drafted the manuscript. Jinye Mi and Qinqin Xu collect the data, wrote the first version of manuscript, and gave critical comments and suggestions. All authors approved the final version of the manuscript.

ORCID

Yongchang Zhang https://orcid.org/0000-0002-6829-7176

REFERENCES

1. Goldstraw P, Chansky K, Crowley J, Rami-Porta R, Asamura H, Eberhardt WEE, et al. The IASLC lung cancer staging project: proposals for revision of the TNM stage groupings in the forthcoming (Eighth) edition of the TNM classification for lung cancer. J Thorac Oncol. 2016;11:39–51. https://doi.org/10.1016/j.jtho.2015.09.009
2. Hirsch FR, Scagliotti GV, Mulshine JL, Kwon R, Curran WJ Jr, Wu YL, et al. Lung cancer: current therapies and new targeted treatments. Lancet. 2017;389:299–311. https://doi.org/10.1016/S0140-6736(16)30958-8
3. Ramalingam SS, Vansteenkiste J, Planchard D, Cho BC, Gray JE, Ohe Y, et al. Overall survival with osimertinib in untreated, EGFR-mutated advanced NSCLC. N Engl J Med. 2020;382:41–50. https://doi.org/10.1056/NEJMoa1913662
4. Li X, Cai W, Yang G, Su C, Ren S, Zhao C, et al. Comprehensive analysis of EGFR-mutant abundance and its effect on efficacy of EGFR TKIs in advanced NSCLC with EGFR mutations. J Thorac Oncol. 2017;12:1388–97. https://doi.org/10.1016/j.jtho.2017.06.006
5. Parseghian CM, Napolitano S, Loree JM, Kopetz S. Mechanisms of Innate and acquired resistance to anti-EGFR Therapy: a review of current knowledge with a focus on rechallenge therapies. Clin Cancer Res. 2019;25:6899–908. https://doi.org/10.1158/1078-0432.CCR-19-0823

How to cite this article: Mi J, Xu Q, Zhang Y. Lung adenocarcinoma presents with diffuse bone metastasis. Thorac Cancer. 2021;12:2628–9. https://doi.org/10.1111/1759-7714.14110