

CASE REPORT

A rare presentation of lung squamous cell carcinoma metastasis to the distal phalanx of the little finger: a case report

Jianjun Wu^{1,2} | Yinan Zhou³ | Dawei Yang⁴  | Fan Yang^{1,2} 

¹Department of Cardiology, The Second Affiliated Hospital of Harbin Medical University, Harbin, China

²Key Laboratory of Myocardial Ischemia, Ministry of Education, Harbin Medical University, Harbin, China

³Department of Digestive Internal Medicine, The First Affiliated Hospital of Harbin Medical University, Harbin, China

⁴Department of Orthopedics, The Fourth Affiliated Hospital of Harbin Medical University, Harbin, China

Correspondence

Dawei Yang, Department of Orthopedics, The Fourth Affiliated Hospital of Harbin Medical University, Harbin, China.
Email: yangdawei9797@sina.com

Fan Yang, Department of Cardiology, The Second Affiliated Hospital of Harbin Medical University, and The Key Laboratory of Myocardial Ischemia, Chinese Ministry of Education, Harbin, Heilongjiang, China.
Email: yangfana@sina.com

Funding information

National Natural Science Foundation of China, Grant/Award Number: 81901853

Abstract

Lung cancer is one of the most common malignant tumors worldwide. Early detection is the most important factor that affects the prognosis of lung cancer patients. The distal phalanx is a highly unusual metastatic site of lung cancer, and is often misdiagnosed, especially when accompanied by trauma. Herein, we present the case of a 68-year-old male patient who injured his right little finger. We hope this rare case will help clinicians to better diagnosis acral metastases of lung cancer to prolong patient survival.

KEYWORDS

acrometastases, lung neoplasm, micro metastasis, pulmonary disease

1 | INTRODUCTION

Lung cancer remains one of the most malignant forms of human cancer and the leading cause of cancer-related deaths [1]. In rare cases, bone metastasis can occur in bones of the hands or feet [2–4], most commonly in the thumbs but rarely seen around the wrist [5, 6]. The average survival time of lung cancer patients with acral metastases is approximately 6–7

months [7]. Less than 100 case reports of finger bone metastasis from lung cancer can be found via searching the Internet, PubMed, or China National Knowledge Infrastructure (CNKI). Herein, we report a patient with squamous cell carcinoma of the distal phalanx of his little finger. Although treatment for acral metastases is not standardized, we hope this rare case will help clinicians to better anticipate acral metastases to prolong patient survival.

Abbreviations: CT, computed tomography; EGF, epidermal growth factor; EGFR, epidermal growth factor receptor; EMT, epithelial-to-mesenchymal transition; FGF, fibroblast growth factor; FSTL1, follistatin like 1; MET, mesenchymal-to-epithelial transition; MMP9, matrix metalloprotein-9; TGF- β , transforming growth factor- β .

Jianjun Wu and Yinan Zhou contributed equally to this study.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2022 The Authors. *Cancer Innovation* published by John Wiley & Sons Ltd. on behalf of Tsinghua University Press.

2 | CASE PRESENTATION

A 68-year-old male patient, who was a smoker and farmer, presented with a 1-month history of the right little finger swelling, with severe and inflammatory lesions. Approximately 4 months prior to presentation at our institution, the patient accidentally injured the distal segment of his right little finger. Without timely imaging examination, only after simple bandaging fluctuating pain appeared in the distal end of the injured right little finger without radiation. The patient denied fever, sweating, or chills, especially nausea, vomiting, and diarrhea. 1 year prior to presentation (April 2019), chest computed tomography (CT) revealed a left thoracic mass, the patient had neither surgery nor chemotherapy. His right little finger was obviously swelling with tenderness, palpable wave sensations, and poor distal finger revascularization. There was partial soft tissue necrotic melanosis associated with slightly restricted movement of the interphalangeal joints, but sensory and motor function was unremarkable in other fingers. Lung CT suggested a space-occupying lesion in the left lung, and the available evidence showed no distant metastasis. We assessed the general health status of the patient for elective finger surgery. At the request of the patient, the proximal interphalangeal joint of the right little finger was amputated under brachial plexus anesthesia. We found a noteworthy unclear lesion boundary between tumor tissue and the surrounding healthy tissue, with evidence of invasion of approximately 2.5 cm × 2 cm × 1 cm. Intraoperative pathological examination of frozen sections indicated squamous cell carcinoma. Considering his medical history, we definitively diagnosed finger bone metastases from primary lung cancer. The middle and distal phalanges of the little finger were amputated at the level of the proximal interphalangeal joint. The patient was treated with symptomatic support including anti-inflammatories, nutritional support, and strategies for pain management after surgery. Surgical wounds had fully healed and sutures were removed 2 weeks later. Unfortunately, despite trials of chemotherapeutic regimens and radiation, the patient died from complications of lung cancer 7 months later. The detail examination can be found in Supporting information Figure S1–4.

3 | DISCUSSION AND CONCLUSION

We summarized lung cancer cases with phalangeal metastasis published in PubMed over the past 30 years (Supporting information: Table S1). According to the

literature, all cases were male patients. The most common primary tumor site is the lung. The median survival time after diagnosis is less than 12 months. Squamous carcinoma, which is found in more than 90% of bone metastases, is also the most common pathological type in phalangeal metastases [8]. In the hand, the distal phalanx is the most frequently involved bone. Metastases to the distal phalanges are usually misdiagnosed as osteomyelitis, arthritis, gout, or benign/malignant neoplasms of the skin because of similar clinical features and imaging findings. Despite advances in treatment, the overall survival in this patient population has not improved substantially over the past years.

Acral metastases to the phalanges of the hand are extremely rare, the incidence is only 1% [9]. Both basic research and clinical evidence have found that trauma can promote cancer metastasis to sites of injury [10]. Studies have shown that chemokines such as the prostaglandins released after trauma may be responsible for cell migration and adhesion to bone tissue. The wound healing process is associated with increasing levels of EGF and Follistatin-like 1 (FSTL1), leading to circulate tumor cells forming large metastatic lesions at wound sites. Similar to most of the previously reported cases of digital metastasis of lung cancer, this case also developed post-traumatic metastases. Therefore, if trauma plays an important role in the metastatic colonization process, therapies that can heal wounds may be new targets for tumor intervention. However, in this case, it was unclear how the lung tumor cells metastasized to the distal phalanx, and how the adenocarcinoma cells transferred to the distal segment of the finger rather than invading the structures surrounding the lung.

We present this case to emphasize that acral metastases are extremely rare and may be the first symptom of lung cancer. When encountering patients with abnormal lumps located in the hand, non-oncologists should particularly consider the patient's systemic condition with risk factors for lung cancer (such as smoking), as well as local tumor types, characteristics, and growth ratios. It is hoped that with the development of medical technologies including imaging technology, molecular probes, and cancer biotherapy, earlier diagnosis of primary tumors can be performed, which will greatly improve patient outcomes.

AUTHOR CONTRIBUTIONS

Jianjun Wu: Conceptualization (supporting); investigation (supporting); methodology (supporting); writing—review and editing (supporting). **Yinan Zhou:** Software (supporting); supervision (supporting); writing—original draft (supporting); writing—review and editing

(supporting). **Dawei Yang:** Conceptualization (supporting); resources (supporting); supervision (supporting); visualization (supporting); writing—original draft (supporting). **Fan Yang:** Data curation (supporting); formal analysis (supporting); funding acquisition (supporting); investigation (supporting); software (supporting); visualization (supporting); writing—original draft (supporting); writing—review and editing (supporting).

ACKNOWLEDGMENTS

We are grateful to the patient and his family for their collaboration. We thank Ms Yang Ruojia for drawing the Graphical abstract.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data supporting the findings of this study are freely available from the authors to any scientist upon request, without breaching participant confidentiality.

ETHICS STATEMENT

None.

INFORMED CONSENT

Written informed consent was obtained from the patient's next of kin for publication of this case report and any accompanying images.

ORCID

Dawei Yang  <http://orcid.org/0000-0002-7217-9383>

Fan Yang  <http://orcid.org/0000-0003-4676-3778>

REFERENCES

1. Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer statistics, 2022. *CA Cancer J Clin.* 2022;72(1):7–33. <https://doi.org/10.3322/caac.21708>
2. Feng J, Song QB, Peng M. [Two cases of lung cancer with bone metastasis of hand]. *Zhonghua Zhong Liu Za Zhi.* 2017;39(6):477–8.
3. Bellido V, Larranaga I, Vazquez F, Velasco V, Gaztambide S. Bone metastasis located on foot as a clinical presentation of an

adrenocortical carcinoma. *Endocrinol Diabetes Nutr (Engl Ed).* 2018;65(7):418–9. <https://doi.org/10.1016/j.endien.2018.07.005>

4. Lamarca A, Hindi N, Belda-Iniesta C, de Castro J. Foot pain: uncommon presentation of lung cancer. *BMJ Case Rep.* 2012;2012:bcr1220115360. <https://doi.org/10.1136/bcr.12.2011.5360>
5. Ciftidemir M, Ustabasioglu FE, Colbe SA, Ustun F, Usta U, Cicin I. Clinicopathological and prognostic characteristics of acral metastases in patients with malignant disease: a retrospective study. *Acta Orthop Traumatol Turc.* 2021;55(1):67–72. <https://doi.org/10.5152/j.aott.2020.20052>
6. Afshar A, Farhadnia P, Khalkhali H. Metastases to the hand and wrist: an analysis of 221 cases. *J Hand Surg Am.* 2014;39(5):923–32. <https://doi.org/10.1016/j.jhssa.2014.01.016>
7. Morris G, Evans S, Stevenson J, Kotecha A, Parry M, Jeys L, et al. Bone metastases of the hand. *Ann R Coll Surg Engl.* 2017;99(7):563–7. <https://doi.org/10.1308/rcsann.2017.0096>
8. Alessandrini L, Zanoletti E, Cazzador D, Sbaraglia M, Franz L, Tealdo G, et al. Tumor budding to investigate local invasion, metastasis and prognosis in temporal bone squamous cell carcinoma. *Pathol Res Pract.* 2022;229:153719. <https://doi.org/10.1016/j.prp.2021.153719>
9. Hayden RJ, Sullivan LG, Jebson PJ. The hand in metastatic disease and acral manifestations of paraneoplastic syndromes. *Hand Clin.* 2004;20(3):335–43, vii. <https://doi.org/10.1016/j.hcl.2004.03.010>
10. Walter ND, Rice PL, Redente EF, Kauvar EF, Lemond L, Aly T, et al. Wound healing after trauma may predispose to lung cancer metastasis: review of potential mechanisms. *Am J Respir Cell Mol Biol.* 2011;44(5):591–6. <https://doi.org/10.1165/rcmb.2010-0187RT>

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Wu J, Zhou Y, Yang D, Yang F. A rare presentation of lung squamous cell carcinoma metastasis to the distal phalanx of the little finger: a case report. *Cancer Innovation.* 2022;1:194–196. <https://doi.org/10.1002/cai2.20>