

Ioannis Tomos², Nikos Tziolos¹, Thomas Raptakis², Dimitra Kavatha¹

¹4th Department of Internal Medicine, Attikon University Hospital, National and Kapodistrian University of Athens, Medical School, Athens, Greece

²2nd Pulmonary Department, Attikon University Hospital, National and Kapodistrian University of Athens, Medical School, Athens, Greece

Thoracic ultrasound for the detection of rib metastases of non-small cell lung cancer

The authors declare no financial disclosure

Abstract

Transthoracic ultrasound has lately emerged as a useful diagnostic tool for respiratory physicians in the diagnosis of diverse pulmonary diseases, usually including pleural effusion and pneumothorax. However, the use of chest ultrasound may be also critical in the evaluation of chest wall diseases. Therefore, we present an interesting case of a patient with metastases of lung cancer to the rib, detected during the chest wall ultrasound examination. By representing a non-invasive, surface-imaging technique with several advantages, chest ultrasound may evolve to a valid, bed-side diagnostic tool for the diagnosis and follow up of lung cancer with metastases in the chest wall.

Key words: non small cell lung cancer (NSCLC), chest ultrasound, chest wall metastasis

Adv Respir Med. 2018; 86: 101–102

Introduction

A 63 year-old-male, current smoker (60 pack-year), with medical history significant for stage IV non-small cell lung cancer (NSCLC) under chemotherapy, was referred to our department complaining for chest pain on the left hemithorax for the last week. Physical examination revealed decrease breath sounds at the left side of the chest, while there was no evident chest wall mass infiltration. Chest X-ray showed an opacification on the left lung (Fig. 1). Transthoracic ultrasound revealed a hypoechoic mass on the fourth rib, instead of the normal bone echogenicity, consistent with rib infiltration, thus, bony metastasis to the rib was suspected (Fig. 2). This was confirmed by chest-computed tomography (CT) showing a bone metastasis in the frontal side of the fourth rib and the known solid tumor in the left lower lobe (Fig. 3).



Figure 1. Chest X-ray showed an opacification on the left lung

Transthoracic ultrasound has emerged as a useful diagnostic tool for clinicians in the diagnosis of pleural effusion, pneumothorax, interstitial lung syndrome and lately in community-acquired pneumonia [1, 2]. Chest ultrasound

Address for correspondence: Ioannis Tomos, 2nd Pulmonary Medicine Department, Attikon University Hospital, 1, Rimini Street, 12462 Haidari, Athens, Greece,

Tel: +302105831184, Mobile: +306942707287, e-mail: etomos@hotmail.com

DOI: 10.5603/ARM.2018.0014

Received: 14.01.2018

Copyright © 2018 PTChP

ISSN 2451–4934

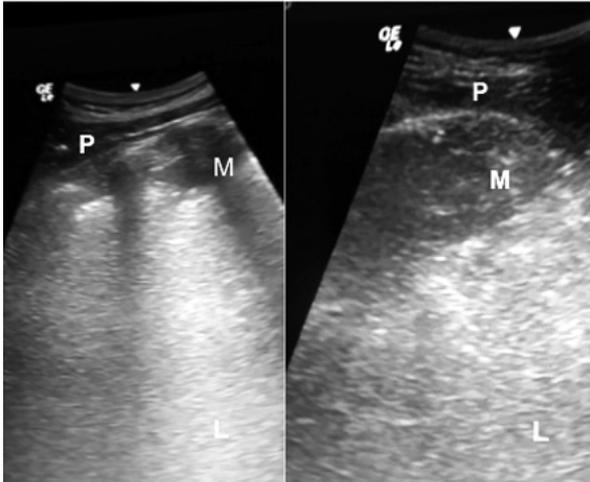


Figure 2. Transthoracic ultrasound revealed infiltration of the fourth rib appearing as a hypoechoic mass and replacing the normal echogenicity of the rib. Definition of abbreviations: P (Pleura), M (Mass), L (Lung)

examination may also be useful in the evaluation of a wide range of pleural and chest wall diseases, including metastases of lung cancer to the ribs [3]. It represents, a non-invasive, surface-imaging technique with several advantages, including the lack of radiation exposure and the possibility to be performed at the bedside. Together, these advantages render chest ultrasound a valid, bed-side diagnostic tool for the diagnosis and follow up of lung cancer with metastases in the chest wall [3, 4].

Conflict of interest

The authors declare no conflict of interest.

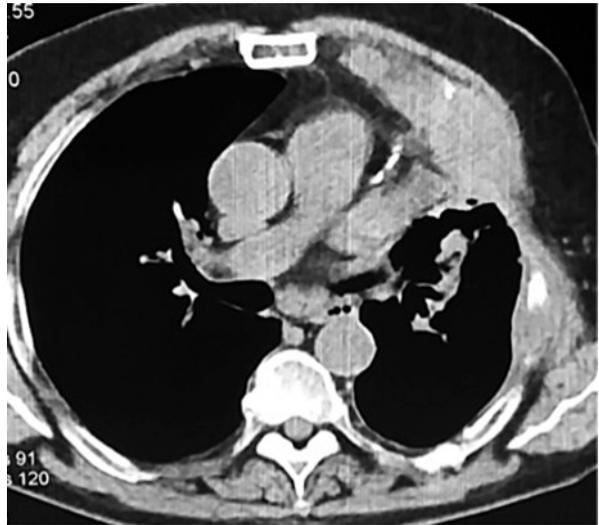


Figure 3. Chest computed tomography (CT) confirmed the presence of a bone metastasis in the frontal side of the fourth rib

References:

1. Chavez MA, Shams N, Ellington LE, et al. Lung ultrasound for the diagnosis of pneumonia in adults: a systematic review and meta-analysis. *Respir Res.* 2014; 15: 50, doi: [10.1186/1465-9921-15-50](https://doi.org/10.1186/1465-9921-15-50), indexed in Pubmed: [24758612](https://pubmed.ncbi.nlm.nih.gov/24758612/).
2. Reissig A, Copetti R, Mathis G, et al. Lung ultrasound in the diagnosis and follow-up of community-acquired pneumonia: a prospective, multicenter, diagnostic accuracy study. *Chest.* 2012; 142(4): 965–972, doi: [10.1378/chest.12-0364](https://doi.org/10.1378/chest.12-0364), indexed in Pubmed: [22700780](https://pubmed.ncbi.nlm.nih.gov/22700780/).
3. Mathis G, Mathis G, Mathis G, et al. Thoraxsonography — Part I: Chest wall and pleura. *Ultrasound Med Biol.* 1997; 23(8): 1131–1139, indexed in Pubmed: [9372561](https://pubmed.ncbi.nlm.nih.gov/9372561/).
4. Paik SH, Chung MJ, Park JS, et al. High-resolution sonography of the rib: can fracture and metastasis be differentiated? *AJR Am J Roentgenol.* 2005; 184(3): 969–974, doi: [10.2214/ajr.184.3.01840969](https://doi.org/10.2214/ajr.184.3.01840969), indexed in Pubmed: [15728626](https://pubmed.ncbi.nlm.nih.gov/15728626/).