

Cough Induced Rib Fracture in Pregnant Patient: Role of Ultrasound

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Dear Editor,

Cough induced rib fractures during pregnancy are rare and pose unique diagnostic challenges due to the need for minimizing fetal radiation exposure. We present a case of 30 years old pregnant woman in her third trimester who experienced acute chest pain following a severe cough episode. Due to potential risks associated with radiographic imaging, a chest ultrasound was utilized, effectively identifying a fracture in the right 10th rib. This case underscores the critical role of ultrasound in safely and accurately diagnosing rib fractures in pregnant patients, offering a reliable and radiation-free alternative to traditional imaging methods.

A 30-year-old female patient who was 27 weeks pregnant presented with acute chest pain following a severe cough episode. She has no known disease and no abnormal findings were found during routine checks during her pregnancy. The examination revealed no findings other than tenderness in the right upper quadrant. An increase in WBC ($11.83 \times 10^3/\mu\text{L}$) and CRP (22 mg/L) values was detected in laboratory tests. Laboratory values were thought to be due to upper respiratory tract infection and ultrasonography was performed for right upper quadrant pain. Liver echogenicity and size, gallbladder and right kidney were evaluated as normal in abdominal ultrasonography. In the examination performed with superficial probe on the local area where pain was described, discontinuity and stepping signs were observed in the outer contour of the right 10th rib (Fig. 1). It was determined that the patient's pain increased when light pressure was applied with the probe to the location where these findings were found. As a result of the examination and ultrasonography findings, a diagnosis of rib fracture was made. No hematoma or space-occupying lesion was detected in the surrounding tissues. No signs of fracture were detected by ultrasonography in the 9th and 11th ribs or the other ribs. Medical treatment was given to the patient who had a single rib fracture and no examination or ultrasonography findings suggestive of pneumothorax.

Rib fractures are the most common type of injury in chest wall blunt trauma [1]. Even lower energy traumas can cause fractures, especially in older individuals [2]. Patients with rib fractures often feel pain, dyspnea, and in more extreme cases, consequences including hemothorax, pneumothorax, or lung contusions. As the number of broken ribs increases, the risk of mortality also increases [3]. Compared to rib fractures caused by trauma, cough-related fractures are a rare but significant condition in the literature. Severe and recurring coughs can cause fractures under mechanical stress, especially in individuals with lung diseases such as chronic obstructive pulmonary disease or asthma [4]. Increased intra-abdominal pressure and osteogenic state have been suggested as the etiology of cough-related fractures in pregnant women [5]. Since rib fractures in pregnant women carry potential risks for the mother and the fetus, it's critical to diagnose them promptly and precisely.

Chest radiography is the first step in imaging, but trauma-related pathologies were detected in approximately half of the normal radiographs in Computed Tomography (CT) scan [6]. For this reason, CT is considered the gold standard in the diagnosis of rib fractures. However, its use is limited in sensitive populations such as pregnant women due to radiation exposure. In this context, ultrasonography can play an important role in diagnosis because it does not contain radiation and is easily applicable. In their systemic review, Yousefifard et al. [7] found the sensitivity of ultrasonography in the diagnosis of rib fracture to be 94% and the specificity to be 97%. This case report highlights the critical role of ultrasonography in the diagnosis of rib fractures in pregnant patients. Given its radiation-free nature, rapid and reliable results, ultrasonography should be the first-line imaging choice in the

suspicion of rib fracture during pregnancy. The ease of use and high accuracy of ultrasonography provide significant advantages, especially when the use of radiographic and tomographic methods is limited. Wider adoption of ultrasonography for evaluating rib fractures in pregnant patients will enhance patient safety and prevent unnecessary radiation exposure.

Your sincerely,

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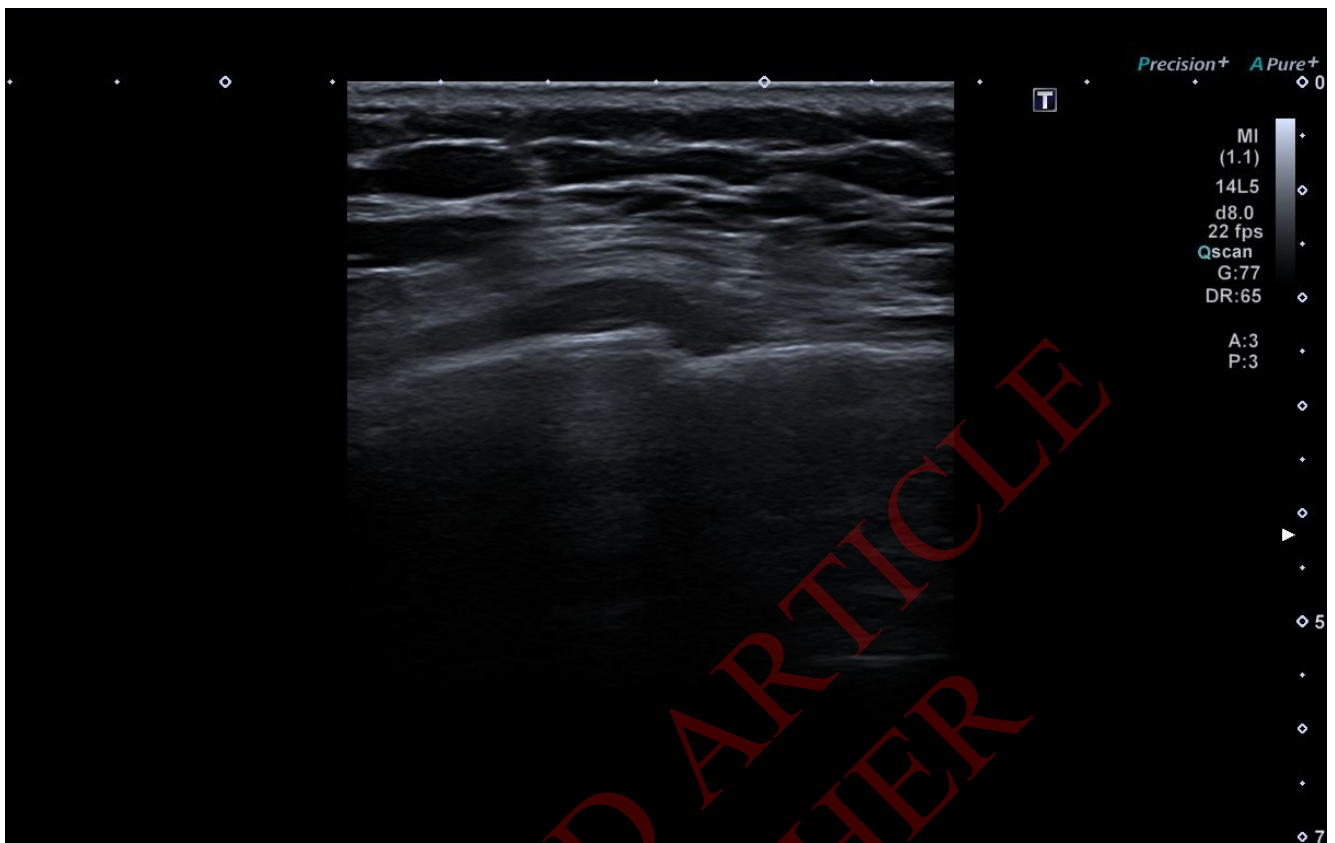


Figure 1. Cortical discontinuity and stepping sign in the ultrasonographic examination of right 10th rib with linear probe