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ORIGINAL ARTICLE

Role of transthoracic ultrasound in the diagnosis of some chest diseases

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KEYWORDS

Ultrasound;
Chest;
Diseases

Abstract The aim of the work is to reveal the role of transthoracic ultrasound in the diagnosis of chest diseases. Thirty one cases that had pulmonary opacities were included.

CT guided biopsy, pleural fluid aspiration, thoracoscopy with pleural biopsy were done when indicated. This study found that transthoracic ultrasound is valuable for the evaluation of a wide variety of chest diseases, particularly when the pleural cavity is involved.

Conclusion: Transthoracic ultrasound is a feasible, safe and low cost method for diagnosis of some chest diseases.

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Introduction

The diagnostic value of transthoracic US is limited by the bony delimitation (ribs, spinal column, sternum, clavicles and scapulae) and the gas content of the lung. The US window is created by consolidation of lung parenchyma or pleural effusion interposed between the lesion and the chest wall, which allows the US beam to penetrate and visualize lesions deep within the lung parenchyma. However, US is less expensive and more convenient than computed tomography (CT) or magnetic resonance imaging (MRI); it provides immediate information with real-time imaging, and can give information not available from a standard radiograph [3].

Ultrasound has been proved to be valuable for the evaluation of a wide variety of chest diseases, particularly when the pleural cavity is involved. Pleural effusion, pleural thickening, pleural tumors, tumor extension into the pleura and even the chest wall, pleuritis, and pneumothorax can be detected easily and accurately with chest ultrasound. The advantages of low-cost, bedside availability and no radiation exposure have made ultrasound an indispensable diagnostic tool in modem pulmonary medicine, [7].

Aim of the work

This study was conducted to reveal the role of transthoracic ultrasound in the diagnosis of chest diseases.

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Subject and methods

The present study was conducted in Chest Department in collaboration with Tropical Department, Kasr EI-Aini Hospital in the period from June 2010 to January 2011.

Study design

The present study included 31 patients who fulfilled the selection criteria and formed the study population. The included patients were selected from the Chest Department inpatients, Kasr EI-Aini Hospital.

Inclusion criteria

1. A chest radiography showing one or more opacities.
2. Presence of dullness by clinical examination over the lung fields.
3. An acoustic window for the ultrasound beam to penetrate.

This window exists when the lesion is in direct contact with the parietal pleura so that the ultrasound beam can propagate through the lesion without being stopped by interopposed air.

Exclusion criteria

– Absence of an acoustic window for the ultrasound beam.

Methodology

– The included patients were subjected to the following:
  (1) Written informed consent
  It was obtained from each patient, including the whole study description, the patient's right to withdraw from the study at any time during his or her participation. The consent also included the acceptance of the patient to use his or her data for publication and presentation after masking his/her name.
  (2) Full history taking with particular attention to
    – Smoking history.
    – Occupational history.
    – Duration of illness.
    – Medication used.
    – Associated illness such as diabetes or hypertension.

  (3) Full clinical examination.
  (4) Chest X-ray
    – Postero-anterior and lateral views.
    – Lateral decubitus film whenever indicated.

  (5) CT chest:
  Also CT guided biopsy was done whenever indicated.
  (6) Bleeding profile:
    – It was done for patients who underwent any invasive procedure.

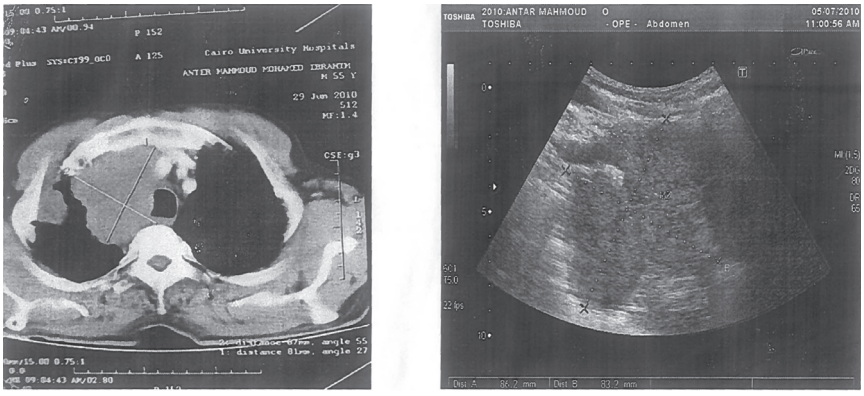
  (7) Pleural effusion analysis (in cases of pleural effusion):
    – The pleural fluid was sent for chemical, bacteriological and cytological examination.

  (8) Thoracoscopy and thoracoscopic pleural biopsies were done whenever indicated.
  (9) Transthoracic ultrasonography.
  (10) Ultrasound guided aspiration of pleural fluid.

Results

These are examples of some sonographic images and the corresponding CT images of certain patients in the current study:

Case 1



Left apical lung mass
(diagnosed by US guided biopsy as bronchogenic carcinoma)

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