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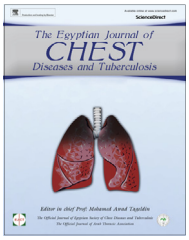

ORIGINAL ARTICLE

Exudative pleural effusions: Comparative study of image assisted Abram needle pleural biopsy and medical thoracoscopy

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KEYWORDS

Pleural effusion;
Closed pleural biopsy;
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Abstract *Background:* Pleural tissue can be harvested either by means of closed biopsies, thoracoscopy or open surgical biopsies. Access to thoracoscopy and open surgical biopsies is limited in many parts of the world and closed biopsies are therefore the preferred initial investigation (Diacon et al., 2003) [6].

Aim of the study: This study aimed to compare the diagnostic efficiency of image-assisted ANPB with that of medical thoracoscopy in patients with exudative pleural effusion.

Patients and methods: Forty patients with non-diagnosed exudative pleural effusions were recruited. All had a contrast-enhanced thoracic CT scan to assess pleural thickening. Patients were randomly stratified by baseline pleural thickening, to either image-assisted Abrams' pleural biopsy ($n = 20$) or medical thoracoscopy biopsy ($n = 20$).

Results: Diagnostic sensitivity of image-assisted ANPB for 20 patients (group I) was 75% (15/20), for group Ia was 60% (6/10), and for group Ib was 90% (9/10). Diagnostic sensitivity of thoracoscopy for 20 patients (group II) was 85% (17/20), for group IIa was 80% (8/10), and for group IIb was 90% (9/10).

Conclusions: Image-assisted Abram-needle pleural biopsy is a primary alternative to thoracoscopy in exudative pleural effusions associated with pleural thickening.

Introduction

Exudative pleural effusions are frequently encountered in pulmonary practice. Determination of a specific diagnosis can represent a major challenge [1]. Barring a few exceptions, virtually all patients presenting with pleural effusions should therefore undergo pleural aspiration to categorize effusions

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into transudates and exudates. This not only narrows the differential diagnosis, but also directs subsequent investigations and management [2].

Pleural biopsy is indicated to improve the diagnostic yield of unexplained pleural effusion, particularly when pleural carcinomatosis or tuberculosis is suspected [3].

Medical thoracoscopy for cases of exudative pleural effusion not having any diagnosis by either clinical, radiologic, laboratory, or cytologic investigation is the method that has been performed routinely in many clinics [4]. In fact, 2010 British Thoracic Society (BTS) pleural disease guideline state that thoracoscopy is the investigation of choice in exudative pleural effusions where a diagnostic pleural aspiration is inconclusive and malignancy is suspected [3]. However, despite a higher diagnostic yield, there are several limitations including need for expertise, cost, invasiveness and lack of availability in some regions that restrict its widespread use [5,6].

The Abram's and Cope needles began the era of closed pleural biopsy providing a safe and easy bedside procedure to evaluate suspected pleural effusion [7,8]. The standard method of using the Abrams pleural biopsy "punch" is to take one biopsy during a single aspiration and if this is negative to repeat the procedure later at a different site [7]. The modified Abrams pleural biopsy technique consisted of suctioning each tissue sample into a syringe without removing the needle completely from the chest until the completion of the entire procedure [9]. Recent studies have proposed that image guidance may significantly increase the yield of closed pleural biopsy while decreasing the risk for complications. Both transthoracic US and CT scanning have been utilized [2,10].

Aim of the study

The present research was done to evaluate and compare the image-assisted Abram's needle efficacy versus medical thoracoscopy in exudative pleural effusions.

Patients and methods

This work was carried out on 40 patients attended to in the Chest Department, Tanta University Hospital during the period from May 2012 to August 2013. The patients presented with exudative pleural effusions based on Light's criteria [11], which a specific diagnosis could not be determined by either clinical, radiologic, laboratory, or cytologic investigations.

This study was performed in compliance with ethical rules at our locality. Written informed consent was taken from each patient after the detailed procedure and purpose of the study was explained. Prothrombin time, activated partial thromboplastin time (APTT), and platelet count were confirmed to be normal before biopsy. Patients with respiratory failure, empyema, acute cardiac event, who had taken oral anticoagulants were excluded from this work.

All patients underwent initial contrast-enhanced CT of the Thorax, using Toshiba CT medical system with overlapping 5-mm sections from the apex of the lungs to the costophrenic recess. We measured the amount of parietal pleural thickening, and participants were divided into those with maximum thickening of less than 10 mm or 10 mm or more (Fig. 1).

The patients were randomized (using closed envelopes), divided into two groups and they underwent pleural biopsy with either; CT guided Abram's needle (group I), or medical thoracoscopy (group II). Each group was divided into two subgroups according to the parietal pleural thickening.

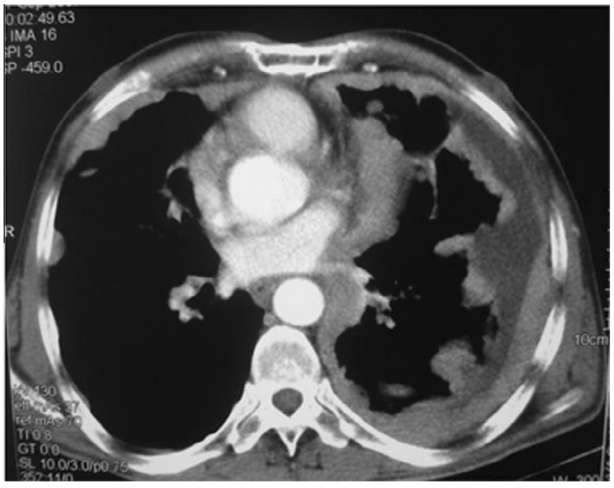

Figure 1 (A) Lt. sided circumferential pleural thickening (> 1 cm) with pleural effusion.

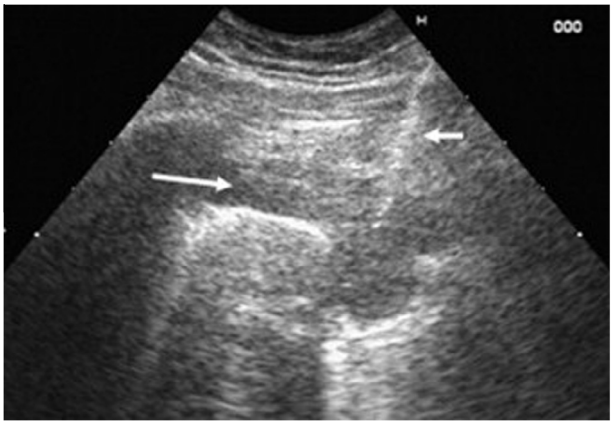

Figure 1 (B) US guided Abram needle pleural biopsy.

Combined image-assisted Abram needle pleural biopsy

Entry site

The entry site was selected as the most accessible part of the lesion by looking at the mediastinal copy of the CT scans. According to the scale located on CT scans, the entry point was determined in two dimensions. Then, the entry site for Abrams needle was marked on the skin of the patient.

US-guidance

After identification of the entry site, local anesthetic was given, with about 10 mL of 2% lidocaine infiltrated into the skin, intercostal space, and parietal pleura. With the patient in a sitting (preferred), prone or a supine position and under direct US guidance (using sonoline-Antares machine (Siemens), with probe C5), an Abram needle was inserted into the patient at the entry site, to be advanced along the inner aspect of the thoracic wall and away from the lung, enabling successful biopsy from the area of maximum pleural thickening.