



The Egyptian Society of Chest Diseases and Tuberculosis
Egyptian Journal of Chest Diseases and Tuberculosis

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Safety and outcome of medical thoracoscopy as diagnostic tool for pleural and pulmonary diseases



Mousa Mohamed Elshamly

Department of Chest Diseases, Faculty of Medicine Al-Azhar University, Egypt

Received 13 May 2016; accepted 1 June 2016

Available online 17 June 2016

KEYWORDS

Medical thoracoscopy;
Undiagnosed pleural effusion;
Pulmonary nodules

Abstract *Background:* The accurate diagnosis of pleural effusion is challenging because even after thoracentesis and/or closed pleural biopsy, 25–40% of pleural effusion remains undiagnosed. Thoracoscopy is now considered the approach of choice for diagnosis of certain kinds of pleural diseases such as pleural mass, malignant pleural effusion with negative pleural fluid cytology, and in the diagnosis of pleural tuberculosis.

Aim of study: To evaluate the diagnostic utility and safety of medical thoracoscopy in patients with undiagnosed exudative pleural effusion and pulmonary parenchyma lesions.

Methods: This study was conducted on 44 patients, 21 males and 23 females with age ranging between 32 and 74 years (mean age 57.59 ± 7.1 years). There were 38 patients with undiagnosed exudative pleural effusion, 3 patients with multiloculated pleural effusion, 1 patient with undiagnosed pulmonary nodules and 2 patients with undiagnosed pulmonary parenchyma ground glass appearance and reticulation. There were 21 patients with co morbidities and 23 patients without co morbidities.

Results: Forty four patients with undiagnosed pleural and pulmonary lesions underwent medical thoracoscopy, multiple pleural nodules were found in 24 out of 44 patients (54.54%). Pleural mass was found in 6 patients (13.63%) and pleural thickness was found in 8 patients (18.2%). Pleura loculation and adhesion was found in 3 patients (6.8%). Pulmonary nodules were found in 1 patient (2.3%). Normal thoracoscopy was found in 2 patients (4.54%) and lung biopsy was taken. As regards histopathology there were 16 patients (36.36%) diagnosed as epithelial mesothelioma, 3 patients (6.81%) diagnosed as metastatic squamous cell carcinoma, 1 patient (2.27%) diagnosed as non Hodgkin lymphoma, and 4 patients diagnosed as tuberculosis. In patients with pleural mass 3 patients (6.81%) diagnosed as sarcomatous mesothelioma and 3 patients (6.81%) diagnosed as non Hodgkin lymphoma. In 8 patients with pleural thickness, 6 patients (13.63%) diagnosed as non specific pleurisy and 2 patients (4.54%) diagnosed as tuberculosis. In 3 patients with pleural loculation they diagnosed as pleural fibrosis. One patient with pulmonary nodules (2.27%) diagnosed as small cell carcinoma. In 2 patients with normal thoracoscopy lung biopsy showed desquamative interstitial pneumonia in 1 patient (2.27%) and usual interstitial pneumonia in 1 patient (2.27%). The diagnostic yield of medical thoracoscopy was 86.4% (38 patients with definite histopathological diagnosis and 6 patients 13.6% diagnosed as non specific pleurisy). As regards thorascopic complications bleeding needed blood transfusion occurred in 1 patient (2.27%) with

malignant mesothelioma, surgical emphysema occurred in 3 patients (1 with metastatic squamous cell carcinoma, 1 with tuberculous pleural effusion and 1 with loculated empyema), hypotension occurred in 1 patient underwent lung biopsy (desquamative interstitial pneumonia), the total thoracoscopic complications were 11.36% which was mild and statistically non significant.

Conclusion: Medical thoracoscopy is safe and effective for the diagnosis of benign and malignant pleural disease and pulmonary nodules.

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Introduction

The accurate diagnosis of pleural effusion is challenging because even after thoracentesis and/or closed pleural biopsy, 25–40% of pleural effusion remains undiagnosed [1,2]. The most common causes of undiagnosed exudative pleural effusion are tuberculosis and malignancy. To find out the cause of pleural effusion, biochemical, cytological and microbiological analysis of pleural fluid is a common practice. It may provide good diagnostic evidence for para-pneumonic effusion, however this initial analysis cannot detect many cases of tuberculosis and malignancy. Pleural biopsy provides diagnostic evidence for both tuberculosis and malignancy [3]. Thoracoscopy is now considered the approach of choice for diagnosis of certain kinds of pleural diseases such as pleural mass, malignant pleural effusion with negative pleural fluid cytology, and in the diagnosis of pleural tuberculosis [4]. Thoracoscopy offers several advantages compared with thoracentesis and closed pleural biopsy, it potentially permits access to entire pleural cavity including both the parietal and visceral pleura, allows for directly visualized biopsies and affords control of bleeding [5]. The diagnostic yield of thoracoscopy in malignant and TB pleural effusion ranges from 91% to 94% and 93% to 100%, respectively. The traditional instrument used for thoracoscopy has been the rigid thoracoscope. Medical thoracoscopy with the rigid thoracoscope can be performed under conscious sedation without the need for mechanical ventilation [6]. Medical thoracoscopy can be used for therapeutic procedures, such as adhesiolysis and evacuation of pleural fluid in patients with empyema, pleurodesis in patients with malignant pleural effusion and spontaneous pneumothorax [7].

Patients and methods

This study was conducted in the Department of Pulmonary Medicine at the Al-Hussien University Hospital, Al-Azhar University, from June 2015 to May 2016. The study was approved by the local institute ethics committee. All patients underwent.

1. Detailed clinical evaluation with full history including age, sex, smoking and asbestos exposure. History of systemic hypertension, diabetes mellitus, cardiac disease, bleeding disorders, previous anesthetic complications and any medication history including anti-platelet/anticoagulant therapy were obtained.
2. Symptomatic variable as dyspnea, chest pain, toxic syndrome that is defined as presence of anorexia, weakness and weight loss.

3. General and local examination.
4. Sputum smears examinations for the presence of Acid-Fast Bacilli (AFB) on three successive days.
5. Chest X-ray and computed tomography (CT).
6. Pleural fluid aspiration and examination, for determination of glucose, protein, lactate dehydrogenase, adenosine deaminase (ADA), culture and sensitivity for bacteria, fungi, ziehl–Neelsen (Z–N) staining and cytological examination.
7. Closed pleural biopsy using Abram's needle and histopathological examination.
8. Bronchoscopy if there is any lung parenchyma lesion in CT chest.
9. Complete blood count including prothrombin time (PT), activated partial thromboplastin time (a PTT) and platelet count to rule out bleeding diathesis.

Indication of medical thoracoscopy

1. Undiagnosed pleural effusion: was defined as failure to achieve a diagnosis by initial pleural fluid analysis including pleural fluid adenosine deaminase (ADA) levels, and pleural fluid cytology and closed pleural biopsy negative for malignant cells.
2. Loculated empyema.
3. Undiagnosed pleural or pulmonary nodules.

Exclusion criteria

1. Patients with platelet count less than 75,000/mm³ and those with PT or a PTT prolonged by more than four seconds above control.
2. Hemodynamic instability or arrhythmias.
3. Uncorrected hypoxemia despite oxygen administration.
4. Patient who cannot withhold lateral decubitus position.
5. Intractable cough.

Thoracoscopy procedure

1. Patients were kept fasting for six hours prior to the procedure.
2. Vascular access was achieved with intravenous cannula inserted in the upper limb opposite to the side of thoracoscopy.
3. Bedside chest ultrasound for determination of accurate entry port.
4. Determination of oxygen saturation.
5. We used single port for visualizing and taking pleural biopsy.

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