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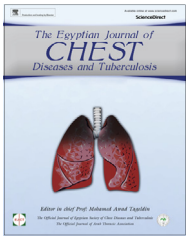

ORIGINAL ARTICLE

Diagnostic yield of medical thoracoscopy in diagnosis of exudative pleural effusion: One year prospective study

Sabah A. Mohamed *, **Marwa M. Shaban**

Chest Department, Faculty of Medicine, Cairo University, Egypt

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KEYWORDS

Undiagnosed exudative pleural effusion;
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Abstract *Background:* Differential diagnosis of pleural disease is often a lengthy process fraught with pitfalls. Contrary to thoracocentesis and closed pleural biopsy, thoracoscopy permits biopsy with direct visualization. Medical thoracoscopy increases the diagnostic yield in patients with pleural disease when thoracocentesis and closed pleural biopsy are non diagnostic.

Aim of the work: This study investigated diagnostic yield of medical thoracoscopy for undiagnosed exudative pleural effusions over one year period.

Patient and Methods: This study included 117 patients with undiagnosed exudative pleural effusions. All patients were subjected to written informed consent, full history taking, clinical examination, plain chest X-ray, CT chest and tuberculin skin test. Diagnostic pleural aspiration was done with pleural fluid chemical and cytological analysis. Patients with unhelpful pleural fluid analysis underwent medical thoracoscopy.

Results: Regarding thoracoscopic pleural biopsy histopathology, out of 117 patients, 55 were diagnosed as malignant pleural mesothelioma, 26 diagnosed as metastatic adenocarcinoma, 1 diagnosed as spindle cell carcinoma, 5 diagnosed as lymphoma, 5 diagnosed as tuberculosis, 1 diagnosed

Abbreviations: VATS, video-assisted thoracic surgery; P–A, posterior–anterior view; CT, computed tomography; LDH, Lactate dehydrogenase; ADA, Adenosine deaminase; AFB, Acid fast bacilli; ECG, electrocardiogram; SD, standard deviation; P-value, probability value; SPSS, statistical package for the social science; MPM, malignant pleural mesothelioma; SLE, systemic lupus erythromatosis; T.B., tuberculosis; N.S., non-significant; Sig., significant.

* Corresponding author. Mobile: +20 01116444422.
E-mail address: samohamedoctober@yahoo.com (S.A. Mohamed).

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as SLE, 2 diagnosed as sarcoidosis, 6 diagnosed as empyema and 16 diagnosed as chronic non specific pleurisy. There was a statistically significant difference between the histopathological subgroups as regards mean value of age and smoking prevalence but there was no statistically significant difference as regards sex. Regarding pleural fluid cytological analysis, 5 cases were positive for malignant cells and 7 cases showed atypical mesothelial cells. Overall complication rate after medical thoracoscopy was low with no reported mortality or major complications.

Conclusion: Medical Thoracoscopy is a valuable diagnostic tool for undiagnosed exudative pleural effusion. It is a simple and safe procedure with low complication rate.

Introduction

Medical thoracoscopy was first introduced in 1866 by S. Gordon who observed the thoracic cavity with a binocular instrument in a case of purulent effusion. Gordon was followed by Hans Jacobaeus, a Swedish internist in 1910 [1].

Between 1915 and 1955 thoracoscopy was almost exclusively used therapeutically in the pneumothorax treatment of tuberculosis. In the early 1960s, thoracoscopy was used, mainly by pulmonologists in Europe, on a much broader basis for the diagnosis of many pleuropulmonary diseases [2].

Due to technical improvements, thoracoscopy was rediscovered by thoracic surgeons at the beginning of this decade, and renamed "surgical" thoracoscopy, better known as video-assisted thoracic surgery (VATS), requiring general anesthesia with selective end-bronchial intubation, disposable equipment, and at least three points of entry [3,4].

Medical thoracoscopy is a minimally invasive procedure performed by the pulmonologists in an endoscopy suite. It is much less invasive requiring only local anesthesia with conscious sedation and only one or two points of entry. It also allows for basic diagnostic (undiagnosed pleural fluid or pleural thickening) and therapeutic procedures (pleurodesis) to be performed safely and distinct from video-assisted thoracoscopic surgery, an invasive procedure that uses sophisticated access platform and multiple ports for separate viewing and working instruments [5].

The present study investigated the diagnostic yield of medical thoracoscopy for undiagnosed exudative pleural effusions over one year period and tried to find out its complication rate.

Subjects

Among the patients of pleural effusion who sought medical advice at the Chest Department, Kasr Alainy Hospital during the period from January 2012 to December 2012, a total of 117 cases were selected.

The selected patients had exudative pleural effusion with negative or unsuccessful pleural fluid analysis. Patients with transudative pleural effusion were excluded.

Methods

All included patients were subjected to written informed consent, detailed history taking, full clinical examination, routine chemical and hematological blood analysis including liver and kidney functions tests, complete blood count, coagulation profile, plain chest X-ray (P–A and lateral view), CT chest and tuberculin skin test. Also diagnostic pleural aspiration was done and the pleural fluid was analyzed for sugar, protein, Lactate dehydrogenase (LDH), Adenosine deaminase (ADA), gram stain, Acid fast bacilli (AFB) smear, culture and cytological analysis. Patients with unhelpful results of pleural fluid analysis underwent medical thoracoscopy and pleural biopsy.

Medical thoracoscopy

Equipment

Rigid thoracoscope with a cold light source was used using a KARL-STORZ rigid thoracoscope (Fig. 1).

Technique

All cases were performed using local anesthesia (Lidocaine 2%) and analgesia using pethidine 100 mg (50 mg was given by intramuscular injection & 50 mg was given by intravenous injection). Lidocaine 2% was used for local anesthesia of the skin, subcutaneous tissues, and periosteum of ribs. The needle was advanced carefully over the superior aspect of the rib, first aspirating and then injecting small amounts of the lidocaine while slowly advancing toward the pleura, till the pleural fluid was drained.

Patient's vital signs and oxygen saturation by means of pulse oximetry were monitored. The patient is positioned in the lateral decubitus position, with the normal lung in the dependent position and the affected side up with the arm rose above the head. The puncture site is usually in the mid-axillary zone between the fourth and sixth intercostal spaces.

The single port entry technique for thoracoscopy was used in all cases. 1–2 cm skin incision was made with a scalpel, which was followed by blunt dissection of intercostal muscles until reduction of resistance is felt and the parietal pleura is reached. Then the rigid trocar which is 8 mm in inner diameter was introduced through the chest wall slowly and carefully. The inner part of the trocar was then withdrawn and the thoracoscope was introduced inside the trocar.

The procedure included the following phases: (1) Careful aspiration of the pleural fluid; (2) Dissection of adhesions preventing proper inspection of the pleural space; (3) Inspection of the pleural space using a direct viewing telescope; and (4) Multiple biopsy samples (usually 5–8) were obtained under direct vision from any abnormal areas in the parietal or visceral pleura with the biopsy forceps.

After obtaining satisfactory biopsy specimens, the thoracoscope was removed followed by the trocar and chest tube (28-32F) connected to under water seal was introduced in the same