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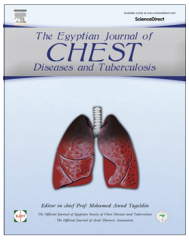

ORIGINAL ARTICLE

Role of thoracoscopic pleural lavage and brush in undiagnosed exudative pleural effusion

Mohamed A. Zamzam [a], Ahmed A. Khames [a], Samy S. El-Dahdouh [a], Hala S. El-Rebey [b], Hanaa A. Eid [a,*]

[a] *Department of Chest Diseases & Tuberculosis, Faculty of Medicine, Menoufia University, Menoufia, Egypt*
[b] *Department of Pathology, Faculty of Medicine, Menoufia University, Menoufia, Egypt*

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KEYWORDS

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Abstract *Background:* The accurate diagnosis of pleural effusion remains a challenging problem even after thoracentesis and closed pleural biopsy. Medical thoracoscopy has been established to have a greater diagnostic yield in the diagnosis of exudative pleural effusion. Forceps biopsy, pleural brush and lavage could be used through medical thoracoscopy to obtain pleural specimens.

Objective: The aim of this study is to evaluate the role of thoracoscopic pleural lavage and brush in undiagnosed exudative pleural effusion.

Patients and methods: This prospective study was carried out on 25 patients having undiagnosed exudative pleural effusion. All patients submitted to medical thoracoscopy, where forceps biopsy, pleural brush and pleural lavage specimens were taken for all patients and sent for histopathological and cytological examination.

Results: Combined thoracoscopic pleural specimens were diagnostic in 24 patients (96%), and all of them were malignant. Forceps biopsy was positive in 23 patients (92%), while pleural brush and pleural lavage were positive in 18 patients (72%) and 15 patients (60%) respectively. Pleural brush was the only diagnostic modality in one patient. Minimal complications were recorded.

Conclusion: Combined thoracoscopic pleural specimens (forceps biopsy, brush and lavage) increase the diagnostic yield of medical thoracoscopy for patients with undiagnosed exudative pleural effusion than separate them. Thoracoscopic pleural brushing is a safe diagnostic technique as it can brush certain dangerous areas of the pleura. Pleural lavage is more diagnostic than the initial thoracentesis.

* Corresponding author.

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Introduction

The accurate diagnosis of pleural effusion remains a challenging clinical problem because even after thoracentesis and closed pleural biopsy 15–20% of pleural effusion still remains undiagnosed [1].

In order to get a pleural biopsy for the diagnosis of undiagnosed pleural effusion, several techniques were used such as percutaneous needle pleural biopsy, CT guided pleural biopsy, medical thoracoscopy, video assisted thoracoscopy and open thoracotomy [2,3].

The term medical thoracoscopy can be used to describe the diagnostic and therapeutic exploration of the pleural space carried out by the pulmonary physician, in the endoscopy unit, mostly under local anesthesia with or without conscious sedation, unlike video-assisted thoracoscopic surgery (VATS) which is conducted under general anesthesia with single lung ventilation [4]. With thoracoscopy, one can visualize the entire visceral and parietal pleura and take pleural biopsy from suspicious sites under vision. A larger pleural biopsy specimen taken under direct vision allows greater diagnostic yield up to 90% [5,6].

Forceps biopsy is the commonest used instrument to obtain thoracoscopic specimens from suspected pleural lesions; however its procedures may be associated with bleeding that hinders further biopsy, additionally the decision to take biopsy could be difficult especially when the targeted lesions are on the visceral pleura or near the vascular structure. On the other hand pleural brush could be used to obtain pleural specimens through medical thoracoscopy from suspected areas either in parietal, visceral pleura or near the vascular structure safely [3,7].

The use of pleural lavage performed by injecting normal saline to pleural space and aspirated at the time of thoracoscopy would provide a higher diagnostic yield than the cytologic analysis of the fluid obtained at thoracentesis and could provide additional diagnostic information to thoracoscopic biopsy. This finding could be explained by one of the following: (1) the cells in the lavage are fresher and have not undergone degeneration as have many cells in the pleural fluid. (2) The lavage procedure could dislodge cells that would not have been detached otherwise. When a malignant tumor metastasizes to the pleura, tumor cells can be seeded over the mesothelial surface or in the subserous layer. In the former situation, tumor cells are abundant in the pleural fluid, but in the latter, few malignant cells are exfoliated into the pleural cavity, and lavage could lead to the recovery of malignant cells. (3) Biopsies of the parietal and visceral pleura could have exposed the tumor and allowed malignant cells to be shed into the lavage fluid [8].

Materials and methods

This prospective study was carried out on 25 patients having undiagnosed exudative pleural effusion (after pleural aspiration and Abrams pleural biopsy were negative) admitted in the Chest Department, Menoufia University Hospital in the period between November 2013 and December 2014. Patients with excess rib crowding, patients with bleeding diathesis, hemodynamic instability, and arrhythmias were not included in this study. All patients submitted for medical thoracoscopy, where forceps biopsy, pleural brush and pleural lavage specimens were taken from all patients. Medical thoracoscopy was performed through a single puncture technique using a rigid thoracoscope (tekno rigid thoracoscope, made in Germany). The procedures were done with complete aseptic precaution under local anesthesia, conscious sedation and potent analgesia. Patients were placed in the lateral decubitus position with the affected side upward. The patients were monitored continuously. Supplemental oxygen was given to them. After local anesthesia, a small skin incision was made in the mid-axillary line either in the fifth or sixth inter-costal space. The skin incision is followed by the introduction of a 10-mm blunt trocar with a cannula into the thoracic cavity. After the trocar was removed, all fluid was suctioned, and then the thoracoscope was introduced into the pleural cavity, where the parietal and visceral pleura were successively inspected. Pleural brush was used first followed by forceps biopsy. Pleural brush was obtained from suspected pleural lesions either in parietal pleura, visceral pleura or near vascular structure. The brushing was done by scratching the suspected areas up and down multiple times and at least 4 samples were taken per patient. Between 6 and 10 forceps biopsies were taken per patient from parietal pleural lesions. The telescope was then removed, and pleural lavage was performed by injecting 300 mL of normal saline. The procedure was followed by the placement of a 28–36F standard chest tube. A chest radiograph was obtained post procedure. Forceps biopsy, pleural brush and pleural lavage specimens were sent for histopathological and cytological examination.

Results

This study was carried out on 25 patients having undiagnosed exudative pleural effusion who underwent medical thoracoscopy in our endoscopy unit for the purpose of reaching the final diagnosis. The characteristics of these patients included the following. The mean age of the patients was 57.5 ± 6.6 years with a range of 32–72 years, 16 males and 9 females. 56% were smokers. Most of the detected lesions were nodules on parietal and visceral pleura in 14 patients, nodules on the parietal pleura in 5 patients, nodules on the visceral pleura in one patient, adhesions and loculations in 2 patients. Congested pleura in 2 patients and no lesions in one patient (Table 1).

The examination of specimens obtained by the thoracoscopic pleural brush was diagnostic in 18 out of 25 cases (72%) Pleural lavage was positive in 15 patients out of 25 cases (60%) while pleural biopsy forceps showed pathology in 23 out of 25 patients (92%) (Table 2) Collectively, the thoracoscopic pleural specimens showed pathology in 24 out of 25 patients

Table 1 Findings detected by medical thoracoscopy.

	No (25)	%
No lesions	1	4.0
Nodules on parietal pleura	5	20.0
Nodules on visceral pleura	1	4.0
Adhesions and loculations	2	8.0
Congested pleura	2	8.0
Nodules on parietal and visceral pleura	14	56.0