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ORIGINAL ARTICLE

Value of thoracoscopic pleural brush in the diagnosis of exudative pleural effusion

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KEYWORDS

Thoracoscope;
Pleural effusion;
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Abstract *Background:* Nowadays, medical thoracoscope had been established to have greater diagnostic yield in the diagnosis of exudative pleural effusion. Forceps biopsy and pleural brush could be used through medical thoracoscope to obtain pleural cytopathological specimens, however the most popular used one was the forceps biopsy.

Aim of this study: To evaluate the value of thoracoscopic pleural brush in the diagnosis of exudative pleural effusion.

Study design: Interventional prospective study.

Setting: Endoscopy Unit, Chest Department, Assiut University Hospital, Egypt.

Material and methods: The study was conducted upon 28 patients with exudative pleural effusion from January 2011 to December 2011, in whom both the conventional pleural tapping and closed pleural biopsy were not conclusive. All patients submitted for medical thoracoscope, where forceps biopsy and pleural brush specimens were taken for all patients.

Results: Thoracoscopic pleural specimens were diagnostic in 26 patients out of 28 ones (92.9%). Histopathological examination of thoracoscopic specimens revealed malignant lesions in (20 patients), TB in (two patients) and non specific inflammation in (four patients). Forceps biopsy was positive in 22 patients, while pleural brush was positive in 17 patients. Thoracoscopic pleural brush was the only diagnostic modality in four patients all were adenocarcinoma. The lesions were mostly on the visceral pleura in one patient in whom visceral pleural brush was taken, while bleeding occurred with forceps biopsy in the other three patient. No complications recorded with pleural brush procedures.

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Conclusion: Thoracoscopic pleural brushing could be done easily and safely and allows obtaining pleural cellular material in areas dangerous to take biopsy specimens. It could augment the diagnostic yield of medical thoracoscopy.

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Introduction

Medical thoracoscopy has received renewed interest among pulmonary physicians in the recent past because of better instrumentation and simpler sedation protocols. With current techniques, medical thoracoscopy can be done as a day-care procedure under conscious sedation by pulmonary physicians. Medical thoracoscopy is a minimally invasive procedure done in spontaneously breathing patient, unlike video-assisted thoracoscopic surgery (VATS) which is conducted under general anesthesia with single lung ventilation [1]. It allows one to visualize the entire pleural surface and perform limited diagnostic and therapeutic procedures. The major indication for medical thoracoscopy is evaluation of exudative pleural effusions which remain undiagnosed after pleural fluid analysis and closed pleural biopsy. With thoracoscopy, one can visualize the entire visceral and parietal pleura and take pleural biopsy from suspicious sites under vision. Larger pleural biopsy specimen taken under direct vision allows greater diagnostic yield up to 90% [2].

The yield of thoracoscopic pleural biopsy is higher in patients with suspected pleural malignancy. A diagnosis could be achieved in 95% of patients as against 44% patients using closed pleural biopsy [3]. Forceps biopsy is the commonest used instrument to obtain thoracoscopic specimens from suspected pleural lesions; however its procedures may be associated with bleeding that hinder further biopsy, additionally the decision to take biopsy could be difficult specially when the targeted lesions were on the visceral pleura or near vascular structure. On the other hand pleural brush could be used to obtain pleural specimens through the medical thoracoscopy from suspected areas either in parietal or visceral pleura safely.

Materials and methods

Patients

Interventional prospective study was conducted upon 28 consecutive patients during the period from January 2011 to December 2011. All the recruited patients had documented exudative pleural effusion in whom the initial pleural tapping and closed pleural biopsy (CPB) were not conclusive. CPB was not conclusive if it was either absence of pleural tissue, normal pleural tissue or non-specific inflammation with strong clinical and radiological data suggestive for alternative pathological diagnosis. All patients underwent medical thoracoscopy in our endoscopy unite. Chest ultrasonography and computed tomography (CT) of the chest were performed to assess feasibility of thoracoscopy. Patients with excess rib crowding with narrow inter-costal space and loculated pleural effusion could not undergo thoracoscopy. Also patients with bleeding diathesis, hemodynamic instability, arrhythmias and intractable cough could not eligible to do thoracoscopy.

Procedure

The medical thoracoscopy was done with complete aseptic precaution under local anesthesia, conscious sedation and potent analgesia. The procedures were performed through a single-puncture technique [4] using semirigid thoracoscope (LTF; Olympus; Tokyo, Japan). Patients were placed in the lateral decubitus position with the affected side upward. The patient's blood pressure, pulse rate, and oxygen saturation were monitored continuously. Supplemental oxygen was given to the patients to maintain oxygen saturation. Lidocaine 2% 10–20 ml was used for local anesthesia. Conscious sedation was achieved with intravenous midazolam (0.5 mg/kg body weight) and intravenous tramadol 5 mg was given for analgesia prior to the start of procedure. Moreover pethidine (meperidine hydrochloride) 25 mg as IM injection could be given to control pain if analgesia could not be achieved with tramadol during the procedure. After local anesthesia was placed, 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 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 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 to obtain pleural specimens from suspect areas under visual control. The procedure was followed by the placement of a 24F standard chest tube. A chest radiograph was obtained post procedure. The histopathological results were noted. Major and minor complications were routinely recorded. Major complications were retrospectively defined as events requiring active medical management during the hospital stay, according to Colt [5]. Minor complications were events requiring medical supervision only.

Results

During a period of 12 months from January 2011 to December 2011, 28 patients underwent medical thoracoscope in our endoscopy unit for the purpose to reach final diagnosis for undiagnosed exudative pleural effusion. The characteristics of these patients are summarized in [Table 1](#). The median age of patients was 53 years with range (22–62 years), 21 males and 7 females. All males were current smokers with median tobacco index equal 25 pack-years. The average duration of the procedure was 21.4 min (15–25 min). Visualization of the pleural space was difficult in two patients due to thick adhesions while thin adhesions seen in four patients that could be taken down by forceps biopsy. Most of the detected lesions were nodules over the diaphragmatic and costal parts of the parietal pleura. Whitish patches revealed in two patients, whitish lymphedema in six patients, anthracotic patches in four patients and nodules over the visceral pleura in 5 cases ([Table 2](#)). The pathological examination of the pleural specimens ob-

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