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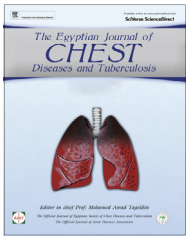

ORIGINAL ARTICLE

Fiberoptic thoracoscopy in management of exudative pleural effusion

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KEYWORDS

Exudative pleural effusion;
Fiberoptic;
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Iodopovidone

Abstract *Objectives:* Exudative pleural effusion represents a common diagnostic task to the clinician. The two commonest causes of exudative pleural effusion are parapneumonic followed by malignant ones. However, obtaining a definite diagnosis is essential for proper management of the effusion. The aim of this work was to evaluate the role of the fiberoptic bronchoscope used as a thoracoscope in management of exudative pleural effusion.

Patients and methods: Eighty-four patients with exudative pleural effusion of undetermined etiology were enrolled in this study. All patients were subjected to full history taking, thorough clinical examination, pleural fluid aspiration and analysis, computed tomography of the chest and ultrasound examination of the pleural cavity. Under conscious sedation and local anaesthesia, fiberoptic thoracoscopy was then carried out using fiberoptic bronchoscope inserted through a rigid large siliconized chest tube. After drainage of the pleural fluid, the pleural cavity was carefully explored and multiple forceps biopsies were taken and sent for histopathological examination. Pleurodesis was then done using iodopovidone in patients with apparent pleural pathology. After lung expansion and pleural fluid drainage of less than 100 cc/day, the chest tube was removed.

Results: Successful histopathological diagnosis was achieved in all patients. It revealed that 63 (75%) cases had malignant pathology and 21 (25%) cases had inflammatory pathology. The malignant pathology was caused by: bronchogenic carcinoma in 28 (33.3%) cases, malignant mesothelioma in 2 (2.38%) cases and metastatic malignant deposits from other organs in 33 (39.28%) cases. The inflammatory pathology was tuberculosis in 16 (19%) cases and non-specific pleurisy in 5 (5.95%) cases. Pleurodesis was performed and was successful in all the patients. Two (2.38%) patients developed empyema after the procedure and they were successfully managed by intercostal

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tube drainage and anitibiotic therapy. Other complications encountered included local wound infection in 3 (3.57%) cases, subcutaneous emphysema in 3 (3.57%) cases and chest pain following pleurodesis in 15 (17.85%) cases.

Conclusion: Thoracoscopy using the fibroptic bronchoscope is safe and effective. It is an alternative technique to rigid thoracoscopy with some advantages as it allows better exploration of the pleura. It is equally as efficient as the rigid thoracoscope and hardly more time consuming. With proper handling, there will not be any damage or abuse of the fibroptic bronchoscope.

Introduction

Pleural effusion evolves in the course of a variety of diseases. It represents a common diagnostic task to the clinician. A correct diagnosis of the underlying disease is essential to the rational management. In some cases, a diagnosis may be established without difficulty. However, despite employment of extensive diagnostic procedures, the cause used to be described as remaining elusive in about 10% of all cases [1].

Pleural effusion is classified into transudate and exudates based on the criteria established by Light [2]. The accuracy of these criteria is very high; however, other authors found poorer diagnostic results when applying Light′s criteria, which may lead to further unwarranted invasive interventions in up to 10–36% of patients with transudates especially after receiving diuretics [3]. The serum serum-pleural albumin gradient can differentiate exudative from pseudo-exudative pleural effusion in such patients. A gradient of pleural fluid to serum albumin $\geqslant 1.2$ g/dL identifies a transudative pleural effusion [4].

The commonest cause of exudative pleural effusion is parapneumonic followed by malignant effusions. Although parapneumonic effusions are commoner, they are usually small and resolve by medical treatment without any invasive intervention [5]. Hence, malignancy is probably the leading cause of exudative effusion subjected to thoracentesis [6]. Nearly all neoplasms have been reported to involve the pleura; however, carcinomas of the lung followed by that of the breast are by far the commonest causes. In approximately 6% of patients with malignant pleural effusions, the primary tumor is not identified [7].

Attempts to obtain a diagnosis for a pleural effusion usually involve fluid aspiration and analysis and biopsy specimens of the pleura by closed needle biopsy. The yield of such procedures is not often satisfactory. The diagnostic yield of a biopsy performed under thoracoscopic vision is often superior. Thoracoscopy, with high quality image, magnification and total visualization of the pleural cavity enables a thorough inventory of the thoracic cavity to be carried out [8].

There are few contraindications to thoracoscopy. Most operators agree that the procedure should be avoided if a pleural space sufficient for visualization and mobilization of the instrumentations is not obtained, patients with severe coagulopathies and very stiff lung which cannot be effectively collapsed. Relative contraindications include honeycomb lung, suspected arterio-venous malformations, highly vascular pulmonary lesions and empyema that cannot be effectively drained using thoracoscopy [9].

The aim of this work was to evaluate the role of the fiberoptic bronchoscope used as a thoracoscope in management of exudative pleural effusion.

Patients and methods

Patients included in this study were seen in the respiratory medicine department of the main teaching hospital of Alexandria University, Egypt. The present study included 84 patients with exudative pleural effusion of undetermined etiology following biochemical, bacteriological and cytological analysis of the pleural fluid. The amount of the pleural fluid was estimated to be more than 500 cc. All patients had a prothrombin activity $>70\%$.

All patients were subjected to full history taking, thorough clinical examination and venous blood sample for complete blood picture, renal and liver function tests, fasting blood glucose level, prothrombin activity, total serum protein, albumin and lactate dehydrogenase content. The pleural fluid was aspirated and analyzed for its total protein and albumin content, lactate dehydrogenase content [LDH], total and differential leucocytic count, Ziehl-Neelsen stain for acid fast bacilli and cytological examination for malignant cells. The followings were then calculated: (1) pleural fluid protein/serum protein ratio, (2) pleural fluid LDH/serum LDH ratio and (3) pleural serum albumin gradient.

Radiological evaluation was carried out by plain X-ray chest postero-anterior view and computed tomography (CT) scan of the chest with focus made on the side and amount of effusion, pleural lesions, underlying lung lesions, metastasis and any other lesions that could be detected. Finally, ultrasound examination of the pleural cavity was often done just before the thoracoscopy procedure to ensure an adequate dependent space for best drainage of pleural fluid while avoiding lung injury. It also allowed detection of pleural adhesions and multi-loculated effusion.

Fiberoptic thoracoscopy was then carried out using fiberoptic bronchoscopy [PENTAX, fiberoptic bronchoscopy] and videoscopy unit (camera [KARL STORZ ENDOSKOPE TELECAM PAL 20211020], light source [HENKE-SASS WOLF GMBH D-7200 TUTTINGEN)], video recorder and television. The patient was positioned lying down in a lateral decubitus position with the involved side facing upwards. The entire lateral chest wall was scrubbed with iodopovidone for disinfection. Exploratory thoracentesis to confirm the presence of pleural fluid at the insertion site was done before insertion of the tube.

Conscious sedation with propofol was carried out with loading doses of 0.2–0.5 mg/kg and maintenance dosages of 0.5–4 mg/kg/h.

The skin, subcutaneous tissues, muscle planes, rib periosteum and parietal pleura were anesthetized by about 30 cc of 1% lidocaine. A 2 cm transverse skin incision was made by a scalpel parallel to the rib along the intercostal space chosen