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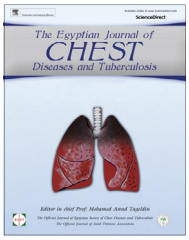

ORIGINAL ARTICLE

Anatomical and histopathological airway abnormalities detected during fiberoptic bronchoscopy in patients with mediastinal lymphadenopathy

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KEYWORDS

Mediastinal lymphadenopathy;
Fiberoptic bronchoscopy;
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Abstract *Background:* The diagnosis in cases of mediastinal and hilar lymphadenitis without parenchymal involvement of the lung is often difficult. Mediastinal lymphadenopathy may be due to a variety of benign or malignant reasons. Hence, it is important to establish a diagnosis and differentiate benign from malignant lymph nodes.

Aim of the work: To study the usefulness of fiberoptic bronchoscopy in diagnosis of patients with mediastinal lymphadenopathy.

Patients and methods: The present study included 30 patients with mediastinal lymphadenopathy. All were subjected to written informed consent, full history taking, full clinical examination, tuberculin skin test, chest X-ray and CT chest. Fiberoptic bronchoscopy including autofluorescence bronchoscopy with mucosal biopsies, TBNA and bronchial lavage were also obtained.

Results: 46.7% of the study patients were diagnosed as malignancy, 20% diagnosed as sarcoidosis, 10% diagnosed as TB, 3.33% diagnosed as reactive lymphadenitis and 20% were undiagnosed. Observed anatomical airway abnormalities included vocal cord paralysis (16.7%), tracheal compression (3.3%), widening of main or second carina (80%) and mucosal abnormalities (46.7%) in the form of nodules, infiltration with tumour tissue and unhealthy mucosa. Bronchial mucosal biopsy was the most useful method of diagnosis (56.7%) followed by TBNA (30%) and finally BAL (13.3%). AFB has no cost effective value over WLB in detection of malignant lesions.

Abbreviations: CT, computed tomography; FOB, fiberoptic bronchoscopy; TBNA, transbronchial needle aspiration; BAL, bronchoalveolar lavage; TB, tuberculosis; AFB, autofluorescence bronchoscopy; WLB, white light bronchoscopy; H&E, haematoxylin and eosin; PAP, Papanicolaou; SPSS, Statistical Package for the Social Science; EBB, endobronchial biopsy; FOB, fiberoptic bronchoscopy; NSCLC, non small cell lung cancer

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Conclusion: The best diagnostic yield was obtained by combination of bronchial mucosal biopsy and TBNA techniques.

Introduction

Mediastinal lymphadenopathy is a common clinical condition encountered by chest physicians. Lymph nodes may be enlarged due to a variety of benign or malignant reasons. Hence, it is important to establish a diagnosis and differentiate benign from malignant lymph nodes [1].

The diagnosis in cases of mediastinal and hilar lymphadenitis without parenchymal involvement of the lung is often difficult. There are many causes of mediastinal and hilar lymphadenopathy, including infection, neoplasm, granulomatous disease and reactive hyperplasia. Chest radiographs and computed tomography (CT) have become the standard technique for demonstration of mediastinal and hilar lymphadenopathy and in many cases biopsy is required to establish the specific diagnosis [2].

The mechanisms responsible for the airway involvement are diverse. The entire spectrum of the airways from the nasal and oral passages to terminal bronchioles can be affected. The anatomic abnormalities may include extrinsic compression of airways by the enlarged lymph nodes, various types of mucosal involvement, luminal stenosis and airway distortion caused by parenchymal changes [3].

Bronchoscopy is an invaluable diagnostic tool for many lung disorders and a safe procedure with low (0.1–2.5%) morbidity and very low (0.05%) mortality. Conventional transbronchial needle aspiration (TBNA) has probably been the most important innovation to the ancillary diagnostic devices (forceps biopsy, bronchial brushing, bronchoalveolar lavage and bronchial washings), as it created the possibility of sampling beyond the wall of the central airways. The quality of the diagnostic bronchoscopic examination is certainly operator dependent, but the pathological analysis and interpretation of the acquired samples is also of eminent importance in the diagnostic process [4].

The aim of the present study was to assess the value of fiberoptic bronchoscopy in diagnosis of mediastinal lymphadenopathy, with special emphasis on:

- Anatomical airway abnormalities (extra luminal compression, widening of the carina, mucosal nodules, unhealthy mucosa, etc.).
- The best sampling method for pathological diagnosis (mucosal biopsy, TBNA and BAL).
- The role of AFB in detection of mucosal abnormalities in patients with mediastinal lymphadenopathy.

Subjects

The present study was conducted in the Chest Department in collaboration with the Pathology Department, Kasr Alainy Hospital, Cairo University. The study included 30 patients with mediastinal lymphadenopathy. Patients who were unfit for bronchoscopy, e.g., patients with refractory hypoxia not responding to oxygen therapy, acute hypercapnia or bleeding disorders were excluded from the study.

Methods

All included individuals were subjected to written informed consent, detailed history taking, full clinical examination, routine chemical and haematological blood analysis including complete blood count, and coagulation profile, arterial blood gases, tuberculin skin test, plain chest X-ray (P-A view) and CT chest with IV contrast. Fiberoptic bronchoscopy (FOB) (PENTAX FB18RX, Ashi Optical, Japan) including autofluorescence (SAFE 1000, Ashi Optical, Japan) bronchoscopy with mucosal biopsies, TBNA and bronchial lavage were also done to all included patients.

Fiberoptic bronchoscopy

Patients were fasting for at least 6 h and intravenous access was insured. 0.5–1 mg atropine sulphate was given intramuscular, half an hour before the procedure to reduce the bronchial secretions and suppress vagal overactivity. FOB was performed via the nasal route. Lidocaine 2% was given as local anaesthetic agent. The patient's pulse oximetry, heart rate and blood pressure were monitored throughout the procedure to ensure adequate oxygenation and hemodynamic stability.

Steps of the procedure

After insertion of FOB and visualization of vocal cords, systematic inspection of the tracheobronchial tree was done, with identification of sites of lesions, such as: widening of the main or secondary carina, extra luminal compression, mucosal abnormalities (e.g., nodules, infiltration with tumour tissue or unhealthy mucosa).

Autofluorescence bronchoscopy was done routinely after white light bronchoscopy (WLB) to identify sites of abnormal mucosa which was apparently normal by WLB. Abnormal mucosa shows a cold image due to lack of autofluorescence. Neoplastic tissues can be distinguished from surrounding normal tissues by their properties of fluorescence when exposed to blue light [5].

TBNA was performed using a 21-gauge cytology needle consisting of a 140 cm long flexible catheter and a system of 21-G "pull-out" needles. It was performed before any other sampling technique in order to eliminate the possibility of contamination or changing the stage of the tumour in cases of suspected malignancy. The needle system was advanced through the working channel of the bronchoscope with the needle pulled out in the catheter. When the metallic tip of the catheter