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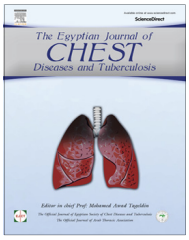

ORIGINAL ARTICLE

Malignant pleural effusion: Relationship between thoracoscopic findings and type of malignancy

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KEYWORDS

Thoracoscopy;
Pleural effusion;
Mass;
Nodules;
Plaques;
Adhesions

Abstract *Background:* Pleural malignancy either primary or due to metastatic involvement can be presented by different macroscopic appearances in thoracoscopic examination of pleural cavity.

Purpose: To identify the relationship between thoracoscopic view of different malignant pleural lesions and pathological types of malignancy in malignant pleural effusion.

Patients and methods: A retrospective study reviewing medical reports of sixty-nine (69) patients who underwent medical thoracoscopy and were confirmed to be malignant pleural effusion by pleural tissue biopsy as well as macroscopic appearances of malignant pleural lesions were identified.

Results: Metastatic adenocarcinoma was the main type of malignancy (46 cases 66.7%), followed by malignant lymphoma (9 cases 13%), malignant mesothelioma (4 cases 5.8%), squamous cell carcinoma (4 cases 5.8%), small cell carcinoma (3 cases 4.3%), sarcoma (2 cases 2.9%) and lastly spindle cell tumor (single case 1.4%). Nodular appearance of malignant pleural lesions was the main thoracoscopic finding (75.45%) followed by masses (50.7%), plaques (20.3%) and lastly adhesions (14.5%) of cases. Nodules represented the main thoracoscopic finding in both metastatic adenocarcinoma and malignant lymphoma (82.6% and 77.78%, respectively) afterward masses (45.65% and 66.67%, respectively). However; masses represented the main thoracoscopic finding (100%) in malignant mesothelioma followed by nodules (50%).

Conclusion: Inspecting pleural cavity via medical thoracoscopy and identification of macroscopic appearance of different malignant pleural lesions may give a good prospect about the suspected pathological type of malignancy in malignant pleural effusion.

Introduction

Malignant pleural effusion (MPE) is one of the most common problems faced by clinicians in their everyday practice [1]. MPE usually presents in the disseminated and advanced stage of malignancy [2]. In one postmortem series, malignant effusions were found in 15% of patients who died with

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malignancies. Although there have been no epidemiologic studies, malignant pleural effusion is also one of the leading causes of exudative effusion; studies have demonstrated that 42–77% of exudative effusions are secondary to malignancy [1]. Nearly all neoplasms have been reported to involve the pleura. In most studies, however, lung carcinoma has been the most common neoplasm, accounting for approximately one third of all malignant effusions. Breast carcinoma is the second most common. Lymphomas, including both Hodgkin's disease and non-Hodgkin's lymphoma, are also an important cause of malignant pleural effusions. In 5–10% of malignant effusions, no primary tumor is identified [3]. The incidence of mesothelioma varies according to the geographic location. Postmortem studies suggest that most pleural metastases arise from tumor emboli to the visceral pleural surface, with secondary seeding to the parietal pleura. Other possible mechanisms include direct tumor invasion (in lung cancers, chest wall neoplasm and breast carcinoma), haematogenous spread to parietal pleura and lymphatic involvement. Interference with the integrity of the lymphatic system anywhere between the parietal pleura and mediastinal lymph nodes can result in pleural fluid formation [4]. Thoracoscopy is highly sensitive for detecting pleural neoplasia with negative pleural fluid cytology [5]. The possibility of visualizing the pleural cavity and obtaining directed biopsy specimens accounts for diagnosis of more than 90% of pleural neoplasia [6–8]. However, its precise indication in the workup of patients with pleural effusion remains controversial [9]. So; the aim of this study is to identify the relationship between thoracoscopic view of different malignant pleural lesions and pathological types of malignancy in malignant pleural effusion.

Subjects and methods

Patients

A retrospective study reviewed medical thoracoscopic reports of 69 patients with pleural effusion underwent medical thoracoscopy and confirmed to be malignant in the chest department of Mansoura University hospital between January 2013 and April 2014.

Methods

Prethoracoscopy assessment

For each patient, the following were reviewed: (1) detailed medical history, (2) investigations done to reach the final diagnosis including; chest radiographs and chest-CTs, pleural aspiration with cytology and closed pleural biopsy.

Thoracoscopy procedure

Prior to the thoracoscopy procedure, pleural effusion was drained and ipsilateral pneumothorax was induced, both in the endoscopy suite. Thoracoscopy was usually done under local anesthesia with spontaneous breathing and mild sedation (midazolam, fentanyl) by an experienced pulmonologist in the operating room. Patients were placed in lateral decubitus position, with the involved side upward. After skin sterilization, a small skin incision was done with blunt dissection to enter the pleural space between the third and sixth intercostal space, along the midaxillary line. The ribs were not spread. A rigid thoracoscope (Karl Storz, Germany) was inserted, and the pleural cavity was visualized. The parietal, visceral and diaphragmatic pleurae were successively inspected and any pathological lesions were described and identified as well as the mediastinal vessels and lymph nodes were inspected also. Biopsies were performed under direct visual control in all suspect areas, systematically in several parts of the parietal pleura, and sometimes in the visceral pleura, with diathermy forceps. All thoracoscopic pleural biopsies were stained by hematoxylin and eosin and examined by an expert pathologist to diagnose the histopathological type of malignancy. An intercostal tube was inserted before wound closure to evacuate air and fluid. Chest radiographs were routinely obtained with a portable unit, immediately after the procedure and daily thereafter until chest tube removal. On malignant diagnosis cases underwent pleurodesis routinely. Once the lung had expanded and drain output had decreased to less than 50 ml per 24 h, chest tube was removed.

Postthoracoscopy assessment

The recorded major and minor complications were considered. Major complications were retrospectively defined as events requiring active medical management during the hospital stay. Minor complications were events requiring medical supervision only. The duration of drainage was measured from the day medical thoracoscopy was performed to the day on which the chest tube was removed.

Statistical analysis

Data were analyzed using SPSS (Statistical Package for Social Sciences) version 21. Qualitative data were presented as number and percentage. Quantitative data were presented for normality by Kolmogorov–Smirnov test. Normally distributed data were presented as mean and standard deviation. Comparison between final diagnosis was done using Chi-square test. P value < 0.05 was considered significant.

Results

The mean age of studied population was 53.59 years with standard deviation 11.9 with age range from 20 to 78 years. Forty-one were males (59.45%) and twenty-eight of them were females (40.6%).

Table 1 Type of malignancy according to final diagnosis of the studied cases.

Type of malignancy	Frequency	Valid percent
Metastatic adenocarcinoma	46	66.7
Malignant lymphoma	9	13.0
Malignant mesothelioma	4	5.8
Metastatic squamous cell carcinoma	4	5.8
Small cell carcinoma	3	4.3
Sarcoma	2	2.9
Spindle cell tumor	1	1.4
Total	69	100.0