



EVALUATION OF PLEURAL MAI SAMPLING

**Ceren Canbey Goret^{1*}, Nuri Emrah Goret², Zeynep Tuba Ozdemir³, Esra Akyuz Ozkan⁴,
Meryem Dogan⁵, Aylin Gonultas⁶, Serdar Yanik⁷**

¹Haydarpasa Numune Training and Research Hospital, Department of Pathology, Istanbul.

²Dr. Lütfi Kırdar Kartal Training and Research Hospital, Department of General Surgery, Istanbul.

³Bozok University Medical Faculty, Department of Internal Medicine, Yozgat, Turkey.

⁴Bozok University Medical Faculty, Department of Pediatrics, Yozgat, Turkey.

⁵Atatürk University Medical Faculty, Department of Pathology, Erzurum, Turkey.

⁶Tekirdağ State Hospital, Department of Pathology, Tekirdağ, Turkey.

⁷İskenderun State Hospital, Department of Pathology, Hatay.

Corresponding Author:- **Ceren Canbey Göret**

E-mail: drccerencanbey@hotmail.com

<p>Article Info <i>Received 15/08/2014</i> <i>Revised 27/08/2014</i> <i>Accepted 2/09/2014</i></p> <p>Key words: Pleural effusion, Benign, Malignant.</p>	<p>ABSTRACT The abnormal accumulation of pleural fluid into the pleural cavity because of various pathologies described as pleural effusion. The basic mechanisms of pleural effusion are increased secretion or decreased absorption of pleural fluid in the intrapleural space. Different malign or benign clinical processes may cause to pleural effusion. The most common cause of benign pleural effusion is known to be congestive heart failure and parapneumonic pleural effusion. The lung and breast cancers are the most common malignant causes of. When there is a pleural effusion; the treatment of liquid is up to the nature of the liquid ; so the differential diagnosis is so important. Diagnosis is established with clinical, biochemical and pathological findings. In this study we evaluated the cytopathologic diagnosis of 338 pleural mai specimens. Assessment results were divided into four groups as; insufficient, benign, malignant, atypical and they were compared with biopsy results.</p>
--	---

INTRODUCTION

The pleura is a serous membrane that covers the lungs and thoracic cavity. Pleural mai deposited as a thin layer between the two pleural layers [1]. Accumulation of fluid in the pleura is a common clinical problem but the etiology of can not always be detected. The most common method used to determine the etiology of is the investigation of pleural mai and biopsy specimens [2,3].

The cytologic examination of pleural effusion is a quick and effective method in the diagnosis of. Exudative pleural mai accumulation can seen in diseases such as; inflammation or tuberculosis, pneumonia, malignancy, pancreatitis, pulmonary infarction and systemic lupus erythematosus [4]. The reason of Pleural effusion vary between countries. In developed countries, tuberculous pleurisy places in the last row; in our country it can be seen more often [5-7]. Although malignant pleural

effusion is detected by cytology, this is diagnostic in only 65% of patients with malignant pleural effusion. Various studies have noted that this rate varies between 62-90% (3,8). The purpose of this study is to evaluate parameters such as cytopathologic diagnosis in the distribution of pleural effusion and their relation with age, gender.

MATERIALS AND METHODS

A total of 338 pleural mai specimens were identified retrospectively in Istanbul Special Ekin Pathology Laboratory, between January 2009 and April 2015. Assessment results were divided into four groups as; insufficient, benign, malignant and atypical and they were compared with biopsy results. Direct spreading liquid materials were examined. Stained with PAP EA. The cell block was obtained from some of the particles containing



liquid material and immunocytochemical analysis was performed on some cell block containing malignant cells.

Findings

A total of 338 cases of pleural effusion; 142 (42.1%) of were female and 196 (57.9%) of male. The age of patients ranged from 15-92, with a average of 65.6 years. Considering the cytological diagnosis; 249 of the cases (73.6%) were benign and of 21 atypical (6.3%), 55 (16.3%) malignant and 13 (3.8%) of were insufficient.

Malignant diagnosis of our patients; 20 were "lung carcinoma", 14 of "breast carcinoma", 4 of "colon carcinoma", 1 of "ovarian carcinoma", 2 of "gastric

carcinoma", 1 of "lymphoma", 1 "prostate carcinoma", 1 "mesothelioma", 11 of as "primary undetectable" (Table 1).

In samples of 21 patients diagnosed as atypical; 7 of was found suspicious for mesothelioma, and 14 of suspicious for carcinoma .

21 patients diagnosed with atypical, the patients were between 60-81 years of age, the average age was 69.7; of 249 benign cases, the patients were between 15-92 years of age, the average age was 65.2. of 55 malignant cases, the patients were between 38-89 years of age, the average age was 65.25; and of 13 insufficient cases, the patients were between 41-82 years of age, the average age was 67.5.

Table 1. Distribution of diagnosis of malignant from pleural cytology

Cytology Diagnostics	Number of Cases
lung carcinoma	20(36,5%)
breast carcinoma	14(25,5%)
ovarian carcinoma	1(1,8%)
gastric carcinoma	2(3,6%)
prostate carcinoma	1(1,8%)
Lymphoma	1(1,8%)
Mesothelioma	1(1,8%)
primary undetectable carcinoma	11(20%)
colon carcinoma	4(7,2%)
Total	55(36%)

DISCUSSION AND CONCLUSION

The etiology of pleural effusion changes by region [5-7]. Pleural effusions can occur due to many diseases and in 20% of the cases the etiology can not be clarified . Pneumonia, liver diseases, heart failure are 80% causes and remaining 20% of cases are associated with malignancy [1].

Arbak *et al*; stated that the most common cause of malignant pleural effusion was primary lung cancer [9]. Bayrak *et al*; have found the most common cause of malignant pleural effusions as lung cancer too [10]. In the of Yank *et al.*, in 2013 two cases of malignant pleural effusion was reported , one of as metastatic breast cancer, the other as small cell carcinoma of the lung [3]. In our study, 55 patients with malignant effusions ; 20 of were "lung carcinoma", 14 of "breast carcinoma", 4 of "colon carcinoma", 1 of "ovarian carcinoma", 2 "gastric carcinoma", 1 "lymphoma", 1 "prostate carcinoma", 1 "mesothelioma", 11 of were "primer undetectable" cases.

Uzunlar *et al*; in their study of 161 patients; reported the mean age as 54.57 [2]. The average age of 92 patients were found to be 60 in the study of Adams *et al* [11]. The average age was 58.4 ± 17.8 years and the patients ages ranged from 15-89 in the study of Dağlı FA *et al* [1]. In a study of Yanık *et al*; patients ages ranged from 15-89 and the average age was 60.72 [3]. In our study; the oldest case was 92 the youngest 15 years old, the average age was 65.6.

In the study of Dağlı FA *et al* of 298 patients, 114 (38.3%) were female and 184 (61.7%) of were male (1). In

the study of Yanık *et al*; of 36 patients, 13 (36.11%) were female and 23 (63.89%) were male [3]. Our study consisted of 338 cases;142 (42.1%) were female and 196 (57.9%) were male.

In the study of Dağlı FA *et al*; 3 cases (1%) were insufficient, 8 of atypical (2.7%), 246 of benign (82.6%), 10 (3.4%) of suspicious (10%, 4) and 31 of were malignant (1). In the study of Yanık *et al*; of 36 patients, 5 cases (13.89%) were insufficient (acellularity), 5 of atypical (13.89%), 21 (58.33%) of benign, 3 of (8.33%) suspicious and 2 (5.56%) of malignant [3]. In our study of 338 pleural fluid; 249 (73.6%) were benign and 21 of atypical (6.3%), 55 (16.3%) of malignant and 13 (3.8%) of were insufficient material. We found 13 (3.8%), insufficient sample cases as consistent with the literature. In the cytological diagnosis of atypical materials, the general problem was the fact that the small number of atypical cells (hypocellularity) were found.

When we examine in detail the cases with malignant mai; malignant mesothelioma and lymphoma cases had previously known stories . The primer can not be detected in 11 cases; besides failing to reach clinical information; no adequate cell block material obtained so immunocytochemical analysis can not be done and failed to reach a further diagnosis. Most of the lung, breast, stomach, colon , prostate and ovarian carcinoma cases had diagnosis previously and in some other cases immunocytochemical analysis was performed for the primer diagnosis. Our malignant cases were with



metastasis or direct infiltration and this was compatible with these type of cancers in the literature.

Ardıç et al ;in their study, 44 patients with malignant pleural effusion, 63.6% had malignant cells and pleural biopsy was done to 38 of them and 68.42% of diagnosed with biopsy [12]. In the study of Yanık et al; 2 malignant pleural cytology was also positive in pleural biopsy [3]. Uzunlar et al; of 54 malignant cases 30 of (55.56%) had positive pleural cytology results [2]. In the study of Dağlı FA et al; of 298 cases ; 31 of had malignant pleural effusion and 24 (8.1%) cases were metastatic carcinoma while 7 (2.3%) of them reported to be malignant mesothelioma [1].

The diagnostic value of cytological examination of malignant pleural effusion is 9-80%, and for pleural biopsies this rate is 11-70% (4). Marel et al studied 171 pleural mai; they argued that in the diagnosis pleural fluid cytology is superior to bronchoscopy, microbiology and biochemical parameters [13]. In his study of Uzunlar et al; the diagnostic value of the cytology in malignant mai was 55.56%, this rate was 59.25% for the biopsy [2]. In the study was of Polatlı et al; the diagnostic value of the cytology in malignant mai was 85.14%; for the biopsy 76.74% [14]. In the study of Yanık et al; these values were

higher for both cytology and biopsy as (100%) , because there was less number of cancer cases [3]. Our values were higher too;this is because the history of the patients were known and immunocytochemical analysis were performed. As a result, pleural cytology is a very important diagnostic method in the detection of malignancies involving the pleura and the most common cause of malignant pleural effusion in our region is lung cancer and breast cancer metastases.

ACKNOWLEDGMENT: None

CONFLICTS OF INTEREST:

On behalf of all authors, the corresponding author states that there is no conflict of interest.

STATEMENT OF HUMAN AND ANIMAL RIGHTS:

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

REFERENCES

1. Dağlı AF, et al. (2011). Cytopathologic diagnosis and cyto-histopathologic correlation in pleural effusion. *Turkish Journal of Pathology*, 27(1), 12-6.
2. Uzunlar AK, et al. (2000). Diagnostic Value of pleural fluid cytology and biopsy: A Retrospective Study. *Respiratory Diseases*, 11, 169-73.
3. Yanık S, Turgut O, et al. (2014). Retrospective analysis of pleural fluid cytology in our case. *KU Medicine Journal*, 16(1), 1-4.
4. Light RW, Macgregor MI, Luchsinger PC, Ball WC. (1972). Pleural effusions: the diagnostic separation of transudates and exudates. *Ann Intern Med*, 77, 507-13.
5. Cakır EE, et al. (2009). Trakya University Medical Faculty Breast Disease Service, a 15-year period, assessment of hospitalized patients with pleural effusion . *Journal of Izmir Chest Hospital*, 23(2), 51-7.
6. Gönülçür TE. (2007). A retrospective analysis of 454 pleural effusion. *Inonu University Faculty of Medicine Journal*, 14(1), 21-5.
7. Metintaş S. (2003). The epidemiology of pleural effusion, pleural diseases. Ankara. *Chest Books-Thoracic Society Publications*, 16-23.
8. Bakır K. (2009). Cytopathology diagnosis of malignant pleural effusions. *Turkish Thoracic Society Therapy Newsletter*, 3(2), 9-12.
9. Arbak P, Karacan O, Erden F. (1998). Ankara University Faculty of Medicine department of Pulmonary Diseases, between 1990-1994, the characteristics of pleural effusions. *Tuberk Chest*, 46, 256-63.
10. Bayrak MG, Erkan L, Uzun O, Fındık S, Atıcı AG. (2006). Evaluation of 153 patients with pleural effusion. *Respiratory Diseases*, 17, 66-7.
11. Adams VI, Unni KK, Muhn RJ. (1986). Diffuse malignant mesothelioma of pleura. Diagnosis and survival in 92 cases. *Cancer*, 58, 1540-51.
12. Ardıç S, Artvinli M, Şahin AA, Ozdemir N. (1987). The success of the method for the diagnosis of pleural effusion. *Respiratory*, 12, 594-604.
13. Marel M, Stastny B, Melinova L. (1995). Diagnosis of pleural effusions: experience with clinical studies, 1986 to 1990. *Chest*, 107, 1598-603.
14. Polatlı M, Aysan T, Erdinç M, Günel O. (1997). The diagnostic value of pleural fluid cytology and pleural biopsy. *Tuberculosis and Thoracic*, 45, 12-5.

