

Diagnostic Approach to Malignant Pleural Effusion- An Experience in Tertiary Care Centre.

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Received: May 2018

Accepted: May 2018

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ABSTRACT

Background: Pleural effusion may be due to benign or malignant causes. Patient with known malignancy raises the possibility of pleural involvement. In majority of cases, malignant pleural effusion is associated with high morbidity and mortality. Confirmation of malignancy by cytological or histological examination of pleural fluid is currently important modality in establishing the diagnosis. Aim And Objective -To diagnose malignant pleural effusion by cytological and histological examination of pleural fluid at our centre. **Methods:** Cross-sectional study including all the patients with pleural effusion done on 101 cases. **Results:** Most of the effusions are benign. Initial pleural fluid cytology was positive for malignancy in 40% of patients. Thoracoscopic pleural biopsy confirmed 75% positive cases for malignancy. Malignancy causing pleural effusion are mostly due to carcinoma of lungs and breast. **Conclusion:** Cytological and histopathological examination of pleural fluid are useful diagnostic tools in patients with pleural effusion.

Keywords: Pleural effusion, cytologic examination, Thoracoscopic pleural biopsy.

INTRODUCTION

Malignant pleural effusion is second leading cause of exudative pleural effusion after parapneumonic effusion.^[1] Nearly 50% of all patient with metastatic cancer develop malignant effusion.^[2] In majority of the cases, malignant pleural effusion signifies incurable disease associated with high morbidity & mortality.^[1] Now-a-days Thoracentesis & pleural fluid cytology are initial diagnostic tools to distinguish malignant effusion from other causes.^[2] Many studies have shown a large variation in diagnostic sensitivity of pleural fluid cytological analysis ranging from 40-87%.^[7] Although almost all types of cancers are cause of malignant pleural effusion more than 75% of malignant effusions are due to metastases originating from tumors in lungs, breast & ovary. Metastatic adenocarcinoma is most frequent histological finding. However, primary tumor is not identified in approximately 10% of patient with malignant effusion.^[4-6]

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MATERIALS AND METHODS

From December 2015 to December 2017, 101 consecutive patients with pleural effusions & suspected malignancy presented to pathology department of VIMSAR, Burla are included in the study.

We analysed the medical history, family history, occupational & addiction history of the patients. Patients were asked about detail clinical symptoms. Complete physical examination was done. Then patients were sent for radiological examination and biochemical analysis of pleural fluid (glucose, proteins, LDH, ADA). Pleural fluid cytology was done in our department. When malignancy was strongly suspected but no definite diagnosis possible by cytology, thoracoscopy pleural biopsy was done.

RESULTS

Among 101 patients with pleural effusion, 26 patients had a strong suspicion of malignant pleural effusion clinically & radiologically.

Most common age group associated with pleural effusion was ≥ 60 yrs (32%) followed by 50-60 yr (30%) & 40-50 yrs (21%). 57 were males & 44 were female in our study. 40 (39.9%) patients had smoking history. Most common symptoms were dyspnea (76%) & chest pain (75%) followed by dry

cough, fever & weight loss. Unilateral effusion was more common than bilateral with left side being more commonly affected. 35% Malignant effusion were haemorrhagic. 30% of malignant pleural effusion were massive. In differential count of malignant pleural effusion, most of the patient showed lymphocytic predominance (95%).

70 patients had pleural fluid glucose more than 60mg/dl & 31 had less than 60mg/dl. 45 patients had LDH > 1000 IU. Maximum patient (92) had protein > 3gm%. Most had ADA ≤ 40. [Table 1]

Sensitivity of pleural fluid cytology is very less. Only near about 40% (11 cases) of suspected malignancy cases come to be positive for malignant cells in Pleural fluid cytology. While nearly 75% (20 cases) come to be positive in thoracoscopic pleural biopsy. [Table 2]

Most of the pleural fluid cytology present the morphology of adenocarcinoma. [Figure 1,2] Only one case as squamous cell carcinoma. [Figure 3,4] [Table 3]

The malignant effusion were histopathologically diagnosed to be adenocarcinoma followed by malignant mesothelioma, lymphoma & squamous cell carcinoma. [Table 4]

Out of 16 adenocarcinoma 8 were from bronchogenic carcinoma, 5 from breast carcinoma and 3 are having unknown primary.

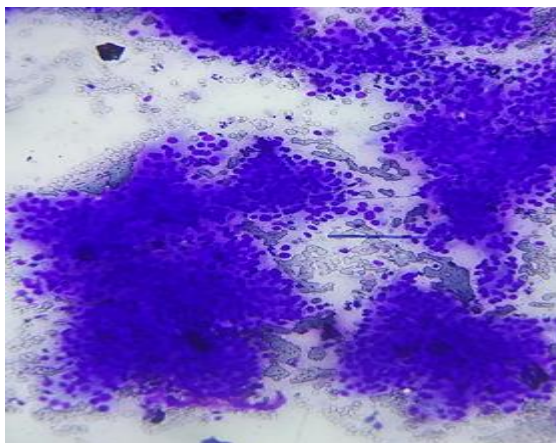


Figure 1: Adenocarcinomatous deposits in pleural fluid. (Hematoxylin And Eosin x 100X)

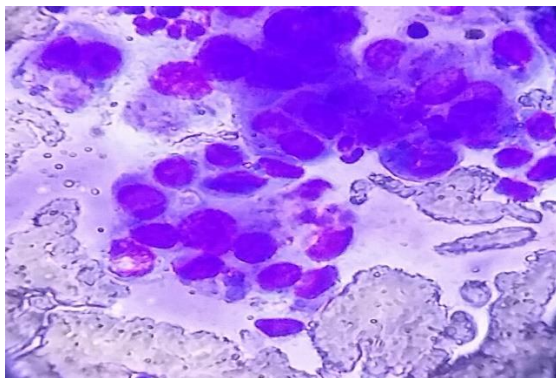


Figure 2: Tumor cells are arranged in groups, clusters and acini. (Hematoxylin And Eosin x 400X)

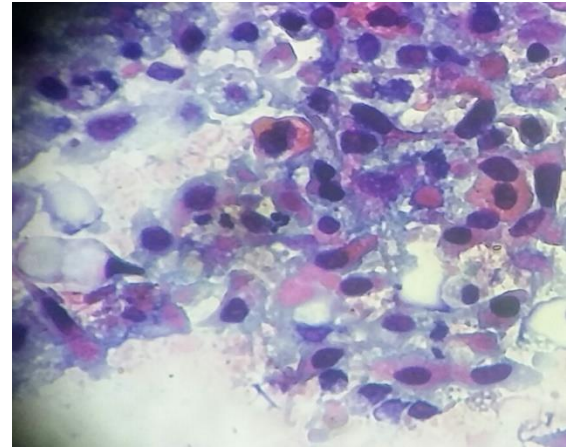


Figure 3: Squamous cell carcinoma in pleural fluid. (Papanicolaou Stain X 400X)

Table 1: Biochemical Analysis Of Pleural Fluid

	Range	No of cases
Glucose	≤60mg%	31
	>60mg%	70
LDH	≤1000IU	06
	≥1000IU	95
Protein	≤3gm	09
	>3gm	92
ADA	≤40	64
	40-70	33
	≥70	4

Table 2: Positive Results In Cytology And Histopathology Study Of Pleural Fluid

26 clinically suspected Malignancy cases.	Pleural fluid cytology for Malignant cells.	Thoracoscopy Pleural biopsy
Positive	11	20
Negative	15	6

Table 3: Cytological Finding Of Pleural Fluid

Cytology finding	No. of patients
Adenocarcinoma	10
Squamous cell carcinoma	1

Table 4: Histopathological Finding Of Pleural Fluid

Histopathology	No. of patients
Adenocarcinoma	16
Squamous cell carcinoma	1
Malignant mesothelioma	2
Lymphoma	1

DISCUSSION

Most of the patients with pleural effusion are of age group more than sixty years and predominantly males. Dyspnea and chest pain are most common symptoms in our study. Mostly patients with pleural effusion are benign & only a few cases are malignant. Most common malignant effusion are massive. But the size of effusion is only suggestive not specific for malignancy. Only 30% of malignant effusion in our case are massive. Similarly, study by K. Cong et al do not recommend use of size of pleural effusion to predict the likelihood of

malignancy.^[2] Maher & Berger reviewed 46 patients with massive pleural effusion & in their study 67% of cases were malignant pleural effusion.^[8] In our study 35% case of malignant pleural effusion are hemorrhagic .In other previous study, near about 55% of hemorrhagic pleural effusion were due to malignant cause.^[9] So, a fluid is hemorrhagic or not does not signify the presence of malignancy. In differential count of malignant pleural effusion, most of the patient have lymphocyte predominance (95%) in our study. Many other study also shows lymphocytic predominance in malignant effusion.^[2] But this finding is not specific. Cytologic examination of pleural fluid is usually the initial diagnostic procedure for detecting malignancy in pleural effusion. Pleural fluid cytology can establish the diagnosis of malignant effusion which ranges for 40%-87%.^[7,10] In our case also single time pleural fluid examination reveals malignancy in 40% of suspected cases. According to the study by light,^[9] 77% of proven malignant pleural effusion had positive cytological results.

The frequency of positive cytological report depends on the type and location of malignancy ,as some tumor like squamous cell carcinoma of lung which are central in location may come negative in cytology.^[9,11,12]

In our study, besides pleural fluid cytology examination, we have also done thoracoscopic pleural biopsy which is superior to blind pleural biopsy. Many studies show medical thoracoscopic pleural biopsies had a sensitivity of 94% and a diagnostic accuracy of 95.08%.^[22] In our study, we get twenty positive cases out of twenty-six suspected malignancy cases with diagnostic accuracy near about 75%.In histopathological examination most common malignancy being adenocarcinoma in our study. Results are similar to some study where adenocarcinoma is most common histopathological finding.^[2] In many studies underlying malignancies are bronchogenic carcinoma and breast carcinoma mostly ,which is same as our study.^[4-6]

CONCLUSION

Cytological and histopathological examination of pleural fluid are important methods which can distinguish malignant effusion from other causes .Accurate diagnosis of malignant effusion help the patients for early treatment and better prognosis thus decreasing morbidity and mortality.

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How to cite this article: Pandey S, Mishra J, Agrawal KC. Diagnostic Approach to Malignant Pleural Effusion- An Experience in Tertiary Care Centre. *Ann. Int. Med. Den. Res*. 2018; 4(4):PT11-PT13.

Source of Support: Nil, **Conflict of Interest:** None declared