



STUDY OF HISTOPATHOLOGICAL SPECTRUM OF LESIONS IN PLEURAL BIOPSY.

Pathology

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ABSTRACT

Pleural diseases, both neoplastic (primary and metastatic) and non-neoplastic, exhibit similar clinical, radiographic and gross features, including pleural pain, pleural-based masses or pleural thickening, and pleural effusions. However, the treatments and prognoses of these diverse conditions vary greatly. As such, accurate diagnosis of pleural disease is critical, and histological interpretation of pleural biopsies is extremely important for correct diagnosis.

Methods: A prospective study was conducted in Department of Pathology, Government Chest hospital, Osmania Medical college, Telangana, during March 2019 to March 2020 that evaluated 65 patients with history of pleural effusion, mass involving pleura and pleural thickening. Detailed history, clinical examination, Radiological Imaging along with pleural biopsy with Abram needle was performed in all the 65 Patients. The biopsy specimens were formalin fixed and the sections were stained with Hematoxylin and Eosin.

Result: The patients aged from 15 to 90 years, average age at presentation was 46.2 yrs. Of total 65 cases 20 were female (31%) and 45(69%) were male. The commonest clinical presentation was shortness of breath with cough. In 65 cases pleural effusion in 58 cases (89%), mass lesion in the lung 6 cases (9%) and pleural thickening 1 case (2%) was preliminary finding on radiology. Histo-pathological evaluation revealed 46 cases (69%) were inflammatory lesions. 8cases (12%) were neoplastic lesions and 11(19%) cases were inadequate sampling. Of 46 inflammatory lesions 12 cases (26%) were granulomatous lesions. Of 8 neoplastic lesions 1 case (12%) was malignant mesothelioma with calretinin and WT1 positive on Immunohistochemistry.

Conclusion: A Pleural Biopsy is a safe, cost effective modality of investigation which not only guides us to diagnosis but also helps in finding out metastatic involvement in a primary Lung tumor. In inflammatory lesions it at times aids in differentiating between granulomatous versus non granulomatous when correlated along with the findings of pleural fluid analysis. But lack of expertise in performing the blind procedure and sample inadequacy are some of the limiting factors in having good satisfactory Pleural Biopsy.

KEYWORDS

Pleural Biopsy, Abram needle, Granulomatous Pleuritis, Malignant mesothelioma.

INTRODUCTION

Needle biopsy of the parietal pleura is useful in determining the cause of pleural effusion. It affords a simple, prompt, means of establishing a diagnosis in many patients, who would otherwise require longer and more complex procedures.¹

Closed needle pleural biopsy has proven its efficacy in the diagnosis of both tuberculous pleurisy and pleural carcinomatosis.^{2,3}

The gold standard for the diagnosis of TB pleuritis is detection of *M. tuberculosis* in the sputum, pleural fluid or pleural biopsy specimens, either by microscopy and/ or culture, or the histological demonstration of caseating granulomas in the pleura along with acid fast bacilli (AFB)^{4,5,6}. In high burden settings, however, the diagnosis is frequently inferred in patients who present with a lymphocytic predominant exudate and high ADA level.

Since the 1950s, mesothelioma has been associated with asbestos.⁷ There are three major challenges in the diagnosis of malignant pleural mesothelioma. Mesothelioma must be distinguished from benign mesothelial hyperplasia; malignant mesothelioma (and its subtypes) must be distinguished from metastatic carcinoma; and invasion of structures adjacent to the pleura must be demonstrated. Clinical history, imaging studies and Histo-pathological evaluation of pleural biopsy helps in diagnostic precision.

MATERIALS AND METHODS

The present study was conducted in the Department of pathology, Government Chest Hospital, Hyderabad Osmania Medical College on patients with history of Shortness of breath, Cough with radiological evidence of pleural effusion, Mass lesion in Lung and pleural thickening from March 2019 to March 2020.

Study design

Prospective study.

Study period

The present study was conducted during March 2019 to March 2020.

Sample size

65 Patients

Sampling procedure

Data collected from the records of Department of Pathology, government Chest Hospital Hyderabad.

Selection criteria

Inclusion Criteria

1. Patients with age more than or equal to 15 years and less than or equal to 90years.
2. Patients with clinical features of Shortness of breath and Cough.
3. Patients with radiological evidence of pleural effusion, mass lesions in Lung involving pleura, pleural thickening.
4. Pleural effusions which are exudative.

Exclusion Criteria

1. Patients with age less than 10 years and more than age of 90 years.
2. Patients with transudatory type of pleural effusion.
3. Patients who are acutely sick with hemodynamic instability.

Procedure

The study was approved by the Ethical and Research Committee of Osmania Medical College, government Chest Hospital, Hyderabad. During the study period, all patients presenting with and fulfilling the inclusion criterion were included in this study after obtaining informed written consent.

All patients underwent closed Pleural Biopsy under aseptic precautions with Abram needle.

The tissue samples were fixed in formalin and undergone standard histopathology processing. Hematoxylin and Eosin stained tissue sections were studied and evaluated.

RESULTS

The patients aged from 15 to 90 years, average age at presentation was 46.2 yrs. Of total 65 cases 20 were female (31%) and 45(69%) were

male. Male to female ratio was 2.2:1 suggesting male preponderance. Of total of 65 cases the commonest clinical presentation was shortness of breath with cough.

Of total 65 cases 57cases (88%)had pleural effusion without any evidence of underlying mass lesion in imaging making it most common presentation in cases indicated for pleural Biopsy.

Of total 65 samples in 11 (16%) samples collected were inadequate so histopathological interpretation was not possible.

Among balance 54 samples studied 45 cases (70% of total cases) were non neoplastic lesions and 8 cases (12% of total cases) were neoplastic lesions ,1 case (2% of total cases) was given suggestive diagnosis of reactive mesothelial hyperplasia needed further evaluation with additional biopsy samples and immunohistochemistry to rule out possibility of malignancy.

Among the 45 non neoplastic cases 12 cases (18% of total cases) were showing the evidence of granulomatous inflammation. 32 cases (49% of total cases) were categorized under nonspecific chronic inflammatory lesions including fibrous pleuritis. One (2% of all cases) case was showing evidence of fungal elements with eosinophil's in the background.

Among 8 neoplastic cases 2 cases showed adenocarcinoma features, 2 cases features of squamous cell carcinoma, 2 cases were labeled as poorly differentiated carcinoma and advised further evaluation. 1 case with previous known history of carcinoma of Breast showed metastatic deposits of carcinoma of breast. So 7 cases (87% of neoplastic cases) out of 8 cases are possible neoplastic lesions which are not primarily arising from pleura but involving pleura.

1 case (12% of neoplastic lesions) of total 8 neoplastic cases was malignant mesothelioma showing Calretinin and WT1 positivity on immunohistochemistry.

DISCUSSION

Pleural diseases, both neoplastic (primary and metastatic) and non-neoplastic, exhibit similar clinical, radiographic and gross features, including pleural pain, pleural-based masses or pleural thickening, and pleural effusions. As such, accurate diagnosis of pleural disease is critical and histological interpretation of pleural biopsies is extremely important for correct diagnosis.⁸

In our present study of total 65 cases 88% of the patients had evidence of pleural effusion in imaging studies. 70% of the lesions were non neoplastic and of total cases 18% of them are granulomatous lesions which is nearly correlating with study conducted by Sant Prakash Kataria Et al. in a study conducted in tertiary care centre in North India.⁹

In total 65 cases the percentage of inadequate sampling was 16% and in Sant Prakash Kataria Et al. study it was 22%. These two studies indicate the importance of expertise and improved results if it's done under imaging guidance or open method rather than closed blind method.

Of total 65 cases, 12% of cases (8) were neoplastic. In these 8 neoplastic cases 88% were non mesothelial origin and 12%(1case, 2% of total cases) was of mesothelial origin . The age of presentation of Mesothelioma was 65 yrs. These findings correlate with various studies suggesting Mesothelioma of pleura is rare and its onset is late after many years after exposure to Asbestos.

TABLE – 1
Case details

cases	No.(%)
Neoplastic (sub-total)	8(12%)
Adenocarcinoma	2
Squamous cell carcinoma	2
Poorly differentiated carcinoma	2
Metastatic deposits of Breast carcinoma	1
Malignant Mesothelioma	1
Inadequate	
Inadequate biopsy sample	11(16%)
Non-Neoplastic (Sub-Total)	45(70%)

Nonspecific chronic inflammatory lesions	32
Granulomatous lesions	12
Fungal lesion	1
Reactive	
Reactive Mesothelial Hyperplasia	1(2%)
Total	65

CONCLUSION

Pulmonologists frequently deal with pleural effusions. Diagnostic work-up and therapy will depend on the evaluation of aetiology and diagnosis of the underlying conditions.

Diagnosis is generally made on needle core biopsies and pleural fluid analysis and cytology specimens; however, occasionally a thorascopic biopsy is required to render adequate tissue for diagnosis. Even in patients with a known primary neoplasm, pleural sampling may be necessary to confirm the presence of the metastasis, to exclude a reactive process mimicking cancer, or to exclude a primary malignancy. Immunohistochemistry methods are frequently employed to supplement histology in evaluating pleural biopsies. Often, the neoplasm's histological pattern can yield a differential diagnosis that can guide the selection of appropriate immune-stains to be performed on the limited tissue sample of the pleural neoplasm.

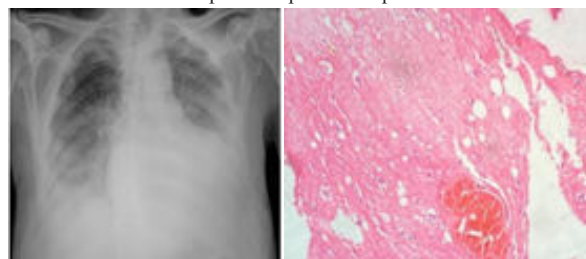


Figure-1

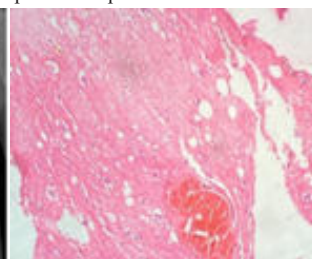


Figure-2

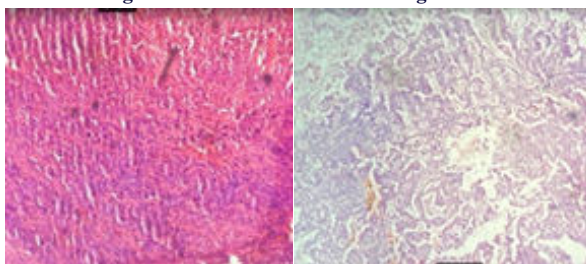


Figure-3

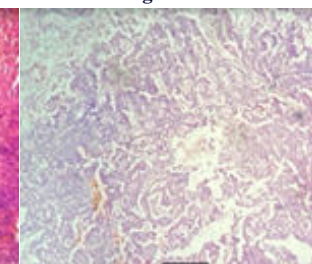


Figure-4

Figure 1: Bilateral pleural effusion.

Figure 2: Normally looking pleural biopsy with entrapped neutrophils and lymphocytes in small foci.

Figure 3: Malignant Mesothelioma (Sarcomatoid).

Figure 4: Adenocarcinoma (deposits).

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