ORIGINAL ARTICLE:

"DIAGNOSTIC ROLE OF PLEURAL BIOPSY IN EXUDATIVE PLEURAL EFFUSION".

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ABSTRACT:

BACKGROUND:

Exudative pleural effusion poses a diagnostic challenge, main differentiation being TB and malignancy. The role of needle biopsy varies in different patient groups and is likely to be of greater benefit in countries with high TB prevalence.

OBJECTIVE:

To evaluate diagnostic yield of Abraham pleural biopsy in cases with exudative pleural effusion.

METHODOLOGY:

A descriptive study was conducted in Jinnah Hospital Karachi, department of chest medicine from September 2007 to March 2009. Seventy nine patients of age> 12 years diagnosed with exudative pleural effusion were consecutively enrolled. Pleural biopsy was performed by Abrams biopsy needle. The main outcome of the study was to evaluate diagnostic yield of Abraham needle biopsy.

RESULTS:

The mean age of the sample was 47.55±18.56 years. There were 49 (62%) males and 30 (39%) were females. The results found that pleural biopsy was diagnostic in 50 (63.29%). Out of 50 patients, 21 (42%) patients had tuberculosis

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and 18 (36%) malignancy. Chronic non specific inflammation was present in 6 (12%) of patients and empyema in 5 (10%) patients.

CONCLUSION:

Abraham needle biopsy is useful in confirming the diagnosis of TB and malignancy in patients with exudative pleural effusion.

Key Words: Pleural Effusion, Abraham Pleural Biopsy, Empyema, Tuberculosis.

Introduction:

Pleural effusion (PE) is a common clinical problem in developed as well as developing countries[1]. It is defined as an excessive accumulation of fluid in the pleural space is labeled on x-ray when 300ml or more fluid is present and clinically when 500ml or more fluid is present[2]. Patients with pleural effusions frequently present a diagnostic and therapeutic challenge. It is very difficult to diagnose the underlying cause by clinical, radiological or even pleural fluid analysis[1].

Pleural biopsy is a safe procedure recommended to perform in cases of exudative pleural effusion[1]. Exudative PE requires careful evaluation for tuberculosis (TB), malignancy (i.e. lung cancer, lymphoma, and metastasis), sarcoidosis etc. However, in regions with high prevalence's of TB differentiation between these entities should always be considered[3-8]. In regions with low prevalence of TB, and in patients aged over 60 years, malignant diseases should be considered the most probable cause, albeit in older patients a reactivation of previous TB may also present as exudative PE[9-11].

Studies conducted in Pakistan have shown pleural biopsy to be conclusive in 49.16%, 71.62% and 93.75%[12,13,14]. This includes 64.40%, 52.71% and 75% for TB whereas 13.55%, 18.91% and 22.5% for malignancy[12,13,14]. A study in Saudia Arabia has showed diagnostic yield of 49.1%. Of these 18.5% revealed neoplasia, 64.8% tuberculosis, and 16.66% empyema[15]. Study by Biswas has showed Specific diagnoses were obtained in 64 cases giving a diagnostic yield of 48.12%. Of these 26.56% revealed malignancy, 57.8% tuberculosis and 15.62% empyema[16]. A study conducted in US has showed pleural biopsy to be successful in distinguishing 50% cases of malignancy and 60% cases of tuberculosis[17].

The objective of this study was to evaluate diagnostic yield of Abraham pleural biopsy in cases with exudative pleural effusion.

PATIENTS AND METHOD:

Study design and setting:

A descriptive study was conducted in Jinnah Hospital Karachi department of chest medicine from September 2007 to March 2009. Jinnah Hospital Karachi is government based tertiary care center, with a target population not only restricted to Karachi but majority of patients are from rural areas of province Sindh and adjoining areas of Baluchistan province.

Sample Population:

The sample includes patients above 12 years of age belonging to either gender with lymphocytic predominant exudative pleural effusion. Diagnosis is established by history, physical examination and confirmed by Pleural fluid direct

report D/R, were consecutively enrolled. Patients on anticoagulant therapy and with bleeding diathesis were excluded. The sample size of the study was (n=79).

Ethical statement:

The ethical approval was obtained from the JPMC ethical review board. Similarly informed consent was obtained from the participant or their attendants before including them in the current study project.

Diagnosis was established by history, physical examination and confirmed by chest radiograph, ultrasound and pleural fluid analysis. Pleural fluid showing exudative predominant lymphocytic pleural effusion was included.

Main outcome variables:

The main diagnoses sought were TB and malignancy. Both were diagnosed histopathologically. TB showing caseating granuloma and chronic inflammation, malignancy showing Squamous cell carcinoma, Adenocarcinoma and small cell carcinoma etc and others

Data Collection:

All the selected patients were interviewed and examined by principal researcher. Pleural biopsy was done on these patients using Abraham's biopsy needle. Usually, 3 biopsy samples were taken. Biopsy specimen was sent for histopathological examination and results were analyzed.

Statistical analysis:

All the data was entered and analyzed in SPSS version 14. Descriptive statistics include means and SD for continuous variables like age. Categorical variables include gender, age groups ≤ 15, 16-27, 28-38, 39-50, 51-62, 63-73 and >74

years, causes of exudative pleural effusion that is TB, malignancy, type of malignancy and others, size of pleural effusion (small, medium and large), type of pleural effusion (left or right sided) and complications were shown in percentages and proportions.

Results:

The mean age of the sample was 47.55±18.56 years (range 15 - 85 years). There were 49 (62%) males and 30 (39%) were females. The study found small pleural effusion (up to 1/3rd of hemi thorax radio logically) in 30 (38%) patients, medium pleural effusion (between 1/3rd to ½ of hemi thorax radio logically) in 38 (48%) patients, and large pleural effusion (more than ½ of hemi thorax radio logically) in 11 (14%) patients. Left sided pleural effusion was found in 49 (62%).

Pleural biopsy was diagnostic in 50 (63.29%) out of 79 patients, while in 29 (36.78%) of patients the result was inconclusive. Out of 50 patients, 21 (42%) patients, have tuberculosis while in 18 (36%) patients result was malignant neoplasm. Types of malignancy found in our sample are shown in table 1. Chronic non specific inflammation was present in 6 (12%) of patients and empyema in 5 (10%) patients.

Discussion:

The main findings of our study were; pleural biopsy was diagnostic in 63% of cases which include 42% TB, 36% malignancy and 22% others. An earlier study from Pakistan showed histopathological diagnosis using pleural biopsy was conclusive in 71.62% patients. Among which 52.71 % cases were of tuberculosis and 18.91 % were malignant[13]. Another study showed pleural biopsy successfully

evaluates the causes in 68.8% of cases, showing 45% TB, 24% malignancy and 31% chronic non specific pleuritis[18]. However other studies showed a low diagnostic value of 48-49% including 13% of TB cases, 9% malignant and 1% of rheumatoid arthritis[19, 12]. This was in contrast to a study by conducted in 2003 in Karachi showing pleural biopsy to be successful in 93.75% of patients among which TB accounted for 75% of cases and malignancy to be 22.5%[14].

This study showed pleural biopsy to be successful in 63% of cases which is in the range identified in previous studies. Furthermore about 42% of cases identified were due to TB and 36% due to malignancy, 12% chronic non specific inflammation and 10% empyema. Prevalence of TB was found to be in line with previous studies while malignancy is high compared to previous studies[13,18,19]. This may reflect differences in patient population being studied or a trend toward malignancy may be more common cause of exudative pleural effusion in our region. The findings were also comparable to international studies conducted in Saudi Arabia, India and US. They have also showed pleural biopsy to be conclusive in 49% and 48%[15,16,17]. Among which TB was found to be a major contributor with 58%-65%[15,16,17]. TB is 42% in our study. Malignancy was common in 19% and 27% in Saudia and India, 36% in our study but a high prevalence of 50% in US[15,16,17]. This was probably as malignancy to be still more common in western world.

Limitations:

This study has several limitations. The pleural biopsy was taken after getting the result of Pleural fluid D/R and cytology was not sent to limit the cost of patient.

Malignancy was diagnosed on the basis of pleural biopsy in this study. TB culture was not performed and newer tests for TB diagnosis were not available.

Conclusion:

This study confirmed a useful role of Abraham needle biopsy in the evaluation of lymphocytic exudative pleural effusion, with main diagnoses established being TB and malignancy.

Conflicting Interests: None

Funding: None

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Table 1. Distribution of Malignancy (n=18)

Malignancy	Frequency	Percent
Adenocarcinoma.	14	77.78
Lymphoproliferat-ive carcinoma.	2	11.11
Metastatic carcinoma	1	5.55

Squamous cell carcinoma	1	5.55