

# Diagnostic Yield of Pleural Biopsy in Gulab Devi Chest Hospital

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## ABSTRACT

**Background:** Sometimes it is difficult to make diagnosis of pleural effusion on routine investigation such pleural effusion is labeled as undiagnosed exudative pleural effusion. Aim of present study was to see the role of pleural biopsy in the diagnosis of undiagnosed exudative pleural effusion.

**Objective:** To know the diagnostic role of pleural biopsy in determining underlying etiological causes of pleural diseases.

**Method:** A total of 71 patients out of which 50 were male and 21 were female patients, aged 15-80 years with mean age 40 years, underwent closed pleural biopsy with Abram's needle. Average 3 biopsy specimens were obtained in each patient, which are examined histopathologically.

**Results:** Pleural biopsy was done in 71 patients. Pleural tissue was obtained in 65 (91.5%) cases. Tuberculosis (caceous granuloma) in 33 (46.4%) Malignancy was diagnosed in 16 (22.5%), non-specific inflammation in 12 (16.9%), non caceous granulomatous pleuritis 4 (5.6%) and cases on histopathological examination.

**Conclusion:** pleural biopsy can determine underlying cause of pleural diseases in most of the patients and is a useful diagnostic test in non-conclusive lymphocytic exudative pleural effusion.

**Keywords:** Pleural biopsy, tubercular effusion, malignant effusion, biopsy needle.

## INTRODUCTION

Pleural disease is a common clinical problem. A pleural biopsy is a procedure to remove a sample of pleural tissue (lines the lungs and inside of chest cavity) for histopathological examination. It is performed to differentiate between malignancy and other viral, bacterial, fungal and parasitic diseases of pleura. It is also performed when chest x-ray indicates non-conclusive lymphocytic exudative pleural effusion.<sup>1</sup>

The procedure of pleural biopsy is called percutaneous needle biopsy or closed needle biopsy. The size of tissue sample obtained by this procedure is relatively small. Needle biopsy of parietal pleura was introduced by DeFrancis in 1955 and this proved to be an important advance. Pleural biopsy has become a standard diagnostic procedure in pleural tuberculosis and malignancy.<sup>2,3</sup> Mostly biopsies are performed by closed technique without using image guidance, such as with Abram's needle. Both techniques have been evolving to improve the diagnostic yield.<sup>4,5,6</sup>

About 49.1% of undiagnosed pleural effusions could be diagnosed by closed pleural biopsy.<sup>7</sup> Diagnostic yield of pleural biopsy depends upon

biopsy technique, number of biopsy specimens, and the expertise of operator and histopathological analysis of biopsy specimen.<sup>8</sup>

## METHOD

### Patient Selection

Study was conducted at Gulab Devi Chest Hospital over a period of 4 months. 71 patients undergoing pleural biopsy were included in this study. All patients included had a non-conclusive lymphocytic exudative pleural effusion or opacity on chest x-ray. Main complaints of patients include fever, cough, sputum, chest pain, dyspnea and weight loss. Prior to biopsy all patients were clinically evaluated and available records like chest x-ray, sputum AFB reports and pleural fluid report in case of pleural effusion were reviewed.

### Procedure

After explaining procedure to the patient, he/she was seated on couch, leaning forward with arm across the chest placed on shoulders. Biopsy site is identified. 2% lignocaine was used to anesthetized skin, subcutaneous tissue, muscle and parietal pleura. Average 3 biopsy specimens were obtained in each patient with Abram's biopsy

needle and placed in 10% formaldehyde. Patients were observed for bleeding and chest x-ray was performed after 4-6 hours to exclude pneumothorax.

**RESULTS**

This study includes 71 patients, 50 males (70.42%) and 21 females (29.67%), aged 15-80 years, with mean age of 40 years. Male gender predominated 70.42% in the study population. Specimen from 65 patients had adequate pleural tissue for histological analysis: biopsy success rate 91.5%.

Out of these 71 patients 55 (77.4%) patient

presents with fever 53 (74.4%) with cough, 29 (40.8%) with dyspnea, 36 (50.75%) with chest pain and 2 (2.81%) with hemoptysis. 13 (18.3%) cases has the history of weight loss and 11 (15.4%) has the history of smoking. Details are listed in table 1

Among the histopathologically proven tubercular patients most of the cases presented with fever, cough, chest pain and dyspnea of which fever was the most common symptom. Fever and cough are the commonest symptom followed by chest pain and dyspnea in cases of malignancy.

**Table 1:** Symptoms of the patients

Symptoms	No. of cases	Male	Female
Fever	55 (77.4%)	41	14
Cough	53 (74.4%)	39	14
Sputum	16 (22.5%)	11	5
Dyspnea	29 (40.8%)	19	10
Chest pain	36 (50.75%)	23	13
Weight loss	13 (18.3%)	8	5
Hemoptysis	2 (2.81%)	2	0
Smoking	11 (15.4%)	2	1

The histopathological diagnosis in these patients is listed in the table 2. The most common final diagnosis was tuberculosis 46.4%; 24 (72.7%) male and 9 (27.3%) female. In 16 (22.5%) cases the pleural effusion was associated with underlying malignancy; 11 (68.75%) male and 5 (31.25%)

female and in 4 (5.6%) is due to granulomatous pleuritis. 12 (16.9%) cases has the diagnosis of non-specific inflammation. No pleura were obtained in 6 (8.45%) cases.

**Table 2:** Histopathological diagnosis of pleural biopsy

Diagnosis on histopathology	No. of cases	Male	Female
Tuberculosis	33 (46.4%)	24 (72.7%)	9 (27.3%)
Malignancy	16 (22.5%)	11(68.75%)	5 (31.25%)
Non-specific inflammation	12 (16.9%)	8 (66.66%)	4 (33.33%)
Granulomatous pleuritis	4 (5.6%)	3 (75%)	1 (25%)
No pleura	6 (8.45)	4 (66.66%)	2 (33.33%)
<b>TOTAL</b>	71	50	21

Malignant group comprised of 16 (22.5%) patients, 5 patients with mesothelioma, 5 with metastatic non-small cell carcinoma and 6 with adenocarcinoma on further investigation. Conclusive histopathological results are obtained

in 53 (74.6%) cases and inconclusive in 18 (25.35%) cases.

None of our patients develop pneumothorax after pleural biopsy and no patient have significant bleeding.

## DISCUSSION

Pleural biopsy is indicated to evaluate patients with undiagnosed exudative pleural effusion particularly those with lymphocytic predominance because the most frequently diagnosed diseases are tuberculosis and malignancy. In 15% to 20% cases the etiology of pleural effusion remained distant despite all conventional and specific investigations.<sup>9</sup> Pleural biopsy can lead to specific diagnosis in these cases effectively with histopathological evaluation. In this study an effort was made to reach an etiological diagnosis in undiagnosed exudative pleural effusion by performing closed needle pleural biopsy.

In our study pleural biopsy was done in 71 patients. Adequate pleura was obtained in 65 (91.5%) case almost similar to others.<sup>3,10</sup> Diagnostic yield of pleural biopsy was 74.6% which is comparable with another study<sup>11</sup> who has 69% yield in their 150 patients and is also comparable with other local and international studies.<sup>8,11,12,13,14</sup>

Tuberculosis was most frequent diagnosis made with pleural biopsy, which indicate that it is the commonest cause of lymphocytic exudative pleural effusion. In tuberculosis pleural biopsy is generally felt to be diagnostic in approximately 50%-80% of cases<sup>15</sup> and some studies report up to 90% sensitivity and 99% specificity<sup>16</sup>. In malignancy diagnostic yield is approximately 40%-60%<sup>15,16</sup>. In our study out of 71 cases 33 (46.4%) were tubercular and 16 (22.5%) malignant histopathologically comparable with other local studies with yield of 64.4% and 13.55% in 120 patients<sup>8</sup>, and 45% and 24% in 150 patients<sup>11</sup> respectively.

In another study, pleural biopsy established the etiology of pleural effusion as tuberculosis and malignancy 31.1% and 22.4% respectively.<sup>18</sup> A study was conducted in India in which out 50 patients of pleural effusion 19(38%) were diagnosed as tuberculosis by pleural biopsy.<sup>19</sup>

Our reported yield of 22.5% for malignancy is comparatively low as compared to international studies<sup>20,21,25</sup> which suggest a yield ranging from 30-70%. This may be due to high prevalence of tuberculosis in our country. Mungal et al. performed this study on 55 cases of which malignancy was proved histopathologically in 47.3% cases.<sup>22</sup>

Inconclusive histopathological reports of chronic non-specific inflammation is not uncommon with range of 33% to 51% in various studies<sup>7,23,24,26</sup> while in our studies the yield of

chronic non-specific inflammation is 16.9%.

## CONCLUSION

Closed needle pleural biopsy is a safe, simple and well-validated diagnostic tool that helps us to differentiate between malignancy and tuberculosis. It is a useful diagnostic test in non-conclusive lymphocytic exudative pleural effusion which is most commonly caused by tuberculosis and malignancy.

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