

## THE ROLE OF PLEURAL BIOPSY IN THE DIAGNOSIS OF EMPYEMA THORACIS WITH SPECIAL REFERENCE TO THE TUBERCULOSIS

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### ABSTRACT

#### BACKGROUND

To look for tuberculosis as a cause of empyema as diagnosed by histopathology of pleural biopsy.

#### METHODS

Twenty five randomly selected cases from the admissions of Empyema thoracis or pyopneumothorax in Pulmonary Department of Govt. General and Chest Hospital, Hyderabad, from Jan. 2014 to Mar. 2015 were included in the study. Closed pleural biopsy, under local anaesthesia, was taken with Abram's pleural biopsy needle.

#### RESULTS

There were 18 male and 7 female patients with the age range between 10 and 65 years. All patients were subjected to pleural fluid examination and sensitivity and pleural biopsy. Twelve (48%) patients had sterile pus, while 52% grew organisms. Pseudomonas aeruginosa and Klebsiella were isolated in 12% of cases each. Coagulase positive staphylococci and pneumococci were also isolated in 8% of cases each. In 3 cases, mixed organisms were isolated.

#### CONCLUSION

Pleural biopsy serves as an important diagnostic tool in the management of empyema thoracic, especially when pleural pus turns out sterile on culture and sensitivity.

#### KEYWORDS

Empyema, Pleural Biopsy, Tuberculosis.

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#### INTRODUCTION

Empyema thoracis is an accumulation of pus in the pleural space. An empyema thoracis follows infection of the pleural space and the structures surrounding the pleura, most commonly secondary to post-infectious pneumonia.<sup>1</sup> Tuberculous empyema remains a common cause of empyema thoracis in a country like India. Description of empyema thoracis can be traced back to the time of Hippocrates. It is a challenging disease with significant morbidity and mortality.

#### MATERIALS AND METHODS

Twenty five randomly selected cases from the admissions of Empyema thoracis or pyopneumothorax in Pulmonary Department of Govt. General and Chest Hospital, Hyderabad, from Jan. 2014 to Mar. 2015 were included in the study. A detailed separate proforma was filled in for each patient. Apart from the investigations like blood count with ESR, chest X-ray, chest ultrasound, and pus culture and sensitivity, a closed pleural biopsy was done on all the patients.

For closed pleural biopsy informed consent was obtained. This was followed by confirmation of pleural fluid by diagnostic aspiration. Later pleural biopsy was taken under local anaesthesia by using Abram's pleural biopsy needle. Four to six biopsy bites were taken.

#### Inclusion Criteria

1. Patients of empyema thoracis above 10 years of age belonging to either sex.
2. Patients diagnosed to have empyema thoracis on the basis of obtaining grossly purulent fluid on aspiration.

#### Exclusion Criteria

1. Patients below 10 years of age.
2. Patients of empyema thoracis of traumatic origin.
3. Diabetics.

#### RESULTS

The study was conducted on 25 patients, 18 (72%) males and 7 (28%) (Table 1). Age distribution ranged from 10 years to 65 years and maximum number of cases, i.e. 8 (32) occurred between 51 to 60 years next to it is majority of cases occurred in the age group of 31 to 40 years (Table 2).

Sex	No. of Cases	Percentage
Male	18	72%
Female	7	28%
<b>Total</b>	<b>25</b>	<b>100%</b>

**Table 1: Sex Distribution of the Patients**

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Age Group	No. of Cases	Percentage
11-20	5	20
21-30	4	16
31-40	5	20
41-50	2	8
51-60	8	32
>60	1	4
<b>Total</b>	<b>25</b>	<b>100</b>

**Table 2: Age Distribution of the Patients**

Sputum for AFB was negative in all. Chest X-ray showed no parenchymal lesions. Majority of cases, i.e. 15 (60%) were due to tuberculosis. Next common, i.e. 9 (36%) was due to pyogenic bronchopulmonary infections. Amoebic empyema was seen in only one among 25 cases studied, i.e. 4% (Table 3). Cultures were sterile in 12 cases, i.e. 48%. Pseudomonas and Klebsiella were isolated in 12% of cases each. Coagulase positive staphylococci and pneumococci were also isolated in 8% of cases each. In 3 cases, mixed organisms were isolated (Table 4).

Sl. No.	Aetiology of Empyema	No. of Cases	Percentage
1	Tubercular	15	60
2	Pyogenic	9	36
3	Amoebic	1	4
<b>Total</b>	<b>Mixed</b>	<b>25</b>	<b>100</b>

**Table 3: Aetiology of Empyema Thoracis**

Sl. No.	Organism	No. of Cases	Percentage
1	No organism growth	12	48
2	Pseudomonas	3	12
3	Klebsiella	3	12
4	Coagulase positive Staphylococci	2	8
5	Pneumococcus	2	8
6	Mixed	3	12
	<b>Total</b>	<b>25</b>	<b>100</b>

**Table 4: Microorganisms Isolated in Cultures of Pleural Fluid**

Sl. No.	Report	No. of Cases	Percentage
1	Chronic granulomatous inflammation	12	48
2	Chronic non-specific inflammation	10	40
	<b>Total</b>	<b>22</b>	<b>88</b>

**Table 5: Results of Pleural Biopsy in Empyema Thoracis**

Sl. No.	Positive Pleural Biopsy	No. of Cases	Percentage
1	First Attempt	12	80
2	Second Attempt	03	20
	<b>Total</b>	<b>15</b>	<b>100</b>

**Table 6: Results of Pleural Biopsy in Tuberculous Empyema**

## DISCUSSION

Empyema is a serious complication of bronchopulmonary infections (59%).<sup>2</sup> It is characterized by concentration of

leucocytes in the pleural fluid, which becomes macroscopically evident as a thick and turbid fluid (Pus). In more than 50% of cases, it is of parapneumonic origin.<sup>3</sup> Other causes include tuberculosis, surgical procedures (Mainly thoracic surgery), traumas and oesophageal perforation to name a few. TB empyema complicates about 3-5% of tuberculosis cases in the developing world. But due to increasing incidence of HIV-Tb co-infection and multidrug resistant tuberculosis, it has been found to complicate as high as 90% of the cases.

According to study by Rizwan Aziz Memon et al.<sup>4</sup> Karachi 2014, the highest incidence of tubercular empyema was in age group of 31 to 40 years. According to various studies, the age distribution of empyema ranged from 10 years to 65 years with our study showing the incidence to be highest in 51-60 years' age group.

The involvement was more in case of males according to various studies like J. Yeh et al.<sup>5</sup> (74.5). Our study shows a male involvement in 72% of cases.

The aetiological origin was varied in various studies with pyogenic origin most common in J. Yeh.<sup>5</sup> et al. (51.81%), William et al.<sup>6</sup> pyogenic (40%). Our study has shown TB as the most common origin, i.e. 60% followed by pyogenic origin 36%. Fever, dyspnoea and cough were the predominant symptoms according to various studies, Devakota et al.<sup>7</sup> fever (63.82%), dyspnoea (57.44%), cough (89%) with our study showing them in 84%, 80% and 76% of cases respectively.

The yield was 75% according to other studies Dilawer Shah et al.<sup>8</sup> in our study the yield was better with second/repeat biopsy than the first biopsy with yield of 80% in first attempt and 100% in the second attempt respectively.

## CONCLUSION

25 cases of Empyema thoracis were randomly selected and studied for the aetiology by doing pleural biopsy mainly.

Males were more affected than females (Male:Female 4.5:1.75); 50 to 60 years' age group was commonly affected, 8 cases (32%). The side of involvement was more on right, i.e. 17 cases (68%). The common presenting symptoms were fever 21 cases (84%) and breathlessness 20 cases (80%). Tuberculosis was the most common, 15 cases (60%) aetiological factor for empyema thoracis. Pleural biopsy has a definite role in the establishment of the diagnosis for correct and effective line of treatment.

Tuberculosis of pleura can be diagnosed if not at the first instance, at least by repeat biopsy which is a must for clinching the diagnosis. Correct line of antibiotics with repeated thoracocentesis is the first choice to be adopted.

If the patient requires chest tube drainage, it should be done at an early stage to avoid the complications and residual pleural thickening and fibrosis. The most common complication that was observed in 12 cases (48%) was pleural thickening.

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