



Empyema Thoracis: A Clinical Study of 15 Cases in Tertiary Care Center

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Abstract

Background: *Empyema thoracis, defined as a collection of pus in the pleural space*

Aims: *To study the clinical, microbiological and treatment outcomes obtained by ICD care in tertiary care hospital.*

Methodology: *A prospective study conducted in tertiary care hospital in 15 patients diagnosed as empyema thoracis*

Results: *In the study, male-to-female ratio was 2:1. Their mean age was 47.86 years. The commonest symptoms at presentation were cough, seen in 14 patients (93.33%). Sputum was positive for AFB by ZN stain in 6 patients (40%) out of 15 in present study. Pseudomonas were isolated most frequently from empyema fluid in 6 patients (40%), followed by sterile pus in 4 (26.66%). Patient was treated with tube thoracostomy connected to an underwater seal drainage and systemic antibiotics, with this approach complete expansion of the lung seen in 8 patients (53.33%), while 3 patients (20%) had only partial expansion, 2 (13.33%) patients had empyema with bronchopleural fistula (BPF) and referred to the cardiovascular thoracic surgery department for decortication.*

Conclusion: *It can be concluded from the above study that, all patients of empyema have chronic morbidity and Intercostal drainage with under water seal was the treatment of choice with most acceptable outcome. If the procedure is performed with appropriate care and adequate post ICD care is provided then chances of developing complications are minimal and most of them are easily curable.*

Keywords: *Intercostal drainage tube, Empyema with bronchopleural fistula (BPF).*

Introduction

An empyema is, by definition, pus in the pleural cavity. The diagnosis and treatment of empyema by surgical drainage was first described by Hippocrates in around 600 B.C.^[1] The first documented description of a closed tube drainage system for the drainage of empyema was by

Hewett in 1867^[2]. Empyema is an illness with significant morbidity^[3,4] and mortality^[5,6]. But acute or chronic infection of pleura is very common in developing countries probably due to poor nutrition and improper management. In India, empyema with pre-existing disease is treated with antimicrobial multiple antitubercu-

lous drugs and Intercostal drainage tube or surgery^[7]. This results in long hospital stay. Many with poor status cannot be subjected to surgery, so Intercostal drainage tube with antimicrobial agents is alternatively practised.

The present study is aimed at studying the etiology, bacteriological features, the clinical presentation, diagnostic modalities, the different modalities of treatment available for this condition and the overall treatment outcome in a teaching hospital.

Material and Methods

This is a study conducted in tertiary care hospital, which include 15 indoor patients with empyema. Valid informed consent and detailed history were taken of all the patients. All routine investigations were done. Pus examination for culture and sensitivity and sputum for AFB microscopy were done in all cases to identify probable etiology. The outcome of the patients in response to various modes of treatment were noted.

Results

A total of 15 patients were included in study. Data was meticulously collected and entered in the MS EXCEL spreadsheet and analyzed. On analysis of the data following observations and results were found in the present study.

In the present study out of 15 patients, total male 10(66.66%), female 5 (33.33%) [Table 1]. Thus the male-to-female ratio was 2:1. Their mean age was 47.86 years. The commonest symptoms at presentation were cough, seen in 14 patients (93.33%); dyspnea in 12 patients (80%); followed by chest pain in 10 patients (66.66 %) and fever in 8 patients (53.33%) [Table 2].

In the present study 8 patients (53.33%) had Past history of tuberculosis, 9 patients were (60%) smokers and 9 (60%) were alcoholic [Table 3,4]. Sputum was positive for AFB by ZN stain in 6 patients (40%) out of 15 in present study [Table 5].

In the present study, Pseudomonas were isolated most frequently from empyema fluid in 6 patients

(40%), followed by sterile pus in 4 (26.66%), Klebsiella in 3 (20%) patients and Staphylococcus Aureus in 2 (13.33%) [Table 6].

Patient was treated with tube thoracostomy connected to an underwater seal drainage and systemic antibiotics, with this approach complete expansion of the lung seen in 8 patients (53.33%), while 3 patients (20%) had only partial expansion, 2 (13.33%) patients had empyema with bronchopleural fistula (BPF) and referred to the cardiovascular thoracic surgery department for decortication, 1 patient left against medical advice and 1 patient expired due to acute respiratory failure [Table 7]

1) Sex Incidence

Sex	No. of patients	%
Male	10	66.66
Female	5	33.33
Total	15	100

2) Clinical presentation of empyema

Symptoms	No. of patients	%
Dyspnoea	12	80
Cough	14	93.33
Chest Pain	10	66.66
Fever	8	53.33

3) Relation with smoking

Smoking	No. of patients	%
Smokers	9	60
Non Smokers	6	40
Total	15	100

4) Relation with Alcohol

Alcoholic	No. of patients	%
Alcoholic	9	60
Non Alcoholic	6	40
Total	15	100

5) Sputum for Acid Fast Bacilli

Acid Fast Bacilli	No. of patients	%
Positive	6	40
Negative	9	60
Total	15	100

6) Bacteriology

Organism	No. of patients	%
No Organism	4	26.66
Pseudomonas	6	40
Klebsiella	3	20
Staphylococcus Aureus	2	13.33
Total	15	100

7) Outcome of Patients

Outcome	No. of patients	%
Complete Expansion	8	53.33
Partial Expansion	3	20
Left against medical advice	1	6.66
Transferred for Thoracic Surgery	2	13.33
Death	1	6.66
Total	15	100

Discussion

The mean age of presentation is 47.86 yrs which is consistent with 2 studies A S Geha^[8], in M M Sherman^[9] which show highest incidence of empyema after 40 yrs of age group.

In present study, male outnumbered female in the ratio of 2:1. The percentage of male incidence of disease in different studies is as follows: R.K. Tandon et al, 75%^[10], A.S. Geha et al^[8] 75.6%, Kamat et al^[11] 88%, Emerson et al^[12] 83.4%. In present study it was 66.66%. It is obvious that males are more prone to mechanical stresses due to strenuous work, smoking and tall stature, tuberculosis, chronic bronchitis with emphysema all these being more common in males^[13].

The study done by Kamat et al^[11] reported cough (94%) to be the most common symptom. This was followed by fever (76%), chest pain (75%) and dyspnea (53%). The prevalence of cough(93.33%) matches that of the study conducted by Kamat et al^[11], whereas dyspnea (80%) encountered more frequent & chest pain (66.66%) & fever (53.33%) encountered less frequently in our patients.

In Kamat et al^[11], 52% are smokers, while in present study 60% patients are smoker.

In our series, we reported positive culture report of pus in 73.33% of cases, Gupta A et al^[14]

reported 54% positive culture fluid while Bryant et al^[15], Sherman et al^[9] and Emerson et al^[12] reported 67.8% , 66% & 69.6% respectively. In present series fluid culture sensitivity report was negative in 26.66%.

In Kamat et al^[11] and Gupta A et al^[14], 57% and 34% cases were positive for sputum acid-fast bacilli respectively, whereas in our study it was 40 %.

Most common organism isolated from pus was Pseudomonas (40%) followed by Klebsiella (20%) and Staphylococcus aureus (13.33%) whereas in study conducted by Gupta A et al^[14] most common organism isolated was Pseudomonas (22%) followed by Staphylococcus aureus (16%) followed by E. Coli (12%).

In present study, Intercostal drainage tube insertion was done in all the patients and it gives good results. Complete and partial expansion was seen in 53.33% and 20% of patients respectively. In BK Khanna et al^[16], 63% of patients and Gupta A et al^[14] 50% of patients show complete expansion of lung. 2 patients were sending for Decortication. So, we suggested that closed Intercostal drainage must be done immediately after hospitalization and pus collected should be monitored every day. Appropriate antibiotics therapy should be started. The overall recovery rate in this series with ICD treatment was 53.33%.

Conclusion

It can be concluded from the above study that, all patients of empyema have chronic morbidity and Intercostal drainage with under water seal was the treatment of choice with most acceptable outcome. If the procedure is performed with appropriate care and adequate post ICD care is provided then chances of developing complications are minimal and most of them are easily curable.

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