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A Clinical Study of Management and Outcome in Empyema Thoracis in a South Indian Teaching Hospital

Authors
Seshagiri Rao Damaraju[1], Raghavendra Rao Manukonda[2]
[1]Associate Prof. of Pulmonology, Rangaraya Medical Collage, Kakinada, Andhrapradesh,
[2]Prof.& HOD Department Of Pulmonology, Rangaraya Medical Collage, Kakinada, Andhrapradesh, India
Corresponding Author
Dr Damaraju Seshagiri Rao
D.No 1-9-23, Sriram Nagar, Kakinada- 533003. East Godhavari,
Andhara Pradesh, India. PH: 919912577664
Email: *drdsraosai@gmail.com*

ABSTRACT

Empyema thoracis is a pyogenic or suppurative infecton of the pleural space. Empyema is the most common exudative type of pleural effusion. Empyema is never a primary disease, often it is difficult to arrive at primary focus of infection, Empyema thoracis is the one of the commonest suppurative lung disease commonly seen in this country in chronic ally ill debilitated patients suffering with diabetes mellitus, immunecomprimised state, alcoholism and tuberculosis. Medical management is limited to culture specific antibiotics. but the role of intercostals tube drainage and appropriate surgical procedures like de-cortication are important for the appropriate timing. In this background we submit this study of incidence and management of Empyema Thoracis in a tertiary care hospital.

Key-Words: *CT-thorax, Culture sensitivity, Decortication, Empyema thorax, Immuno-compromised Patient, ICTD with underwater seal, Morbidity ,Serial Chest-Xrays, ,Thoraco-centesis, Thoracoscopy.*

INTRODUCTION

Pyothorax (Empyema thoracis) is the accumulation of pus within the pleural cavity. The pus is usually thick, creamy and malodorous. If empyema occurs in the setting of underlying suppurative lung disease (i.e pneumonia, lung abscess, or bronchiectasis), it is referred to as a parapneumonic empyema (60% of cases). Other causes of thoracic empyema are surgery (20%), trauma (10%), oesophageal repture, other chest wall or mediastinal infections, bronchopleural fistulae, extension of a subphrenic or hepatic

abscess, instrumentation of the pleural space (thoracentesis, chest tube placement, etc), and rarely hematogenous seeding from a distant site of infection.

Pyothoraxt is the end stage of pleural infection for any reason. It can occur as a complication of any thoracic operation. It may be associated with pus under the diaphragm.14 Empyemas are divided into three phases based on their natural history; 1.acute exudative,2. fibrinopurulent, and3. chronic organizing.

The following are the complications of Empyema Thoracis.

Acute: Bronchopleural fistula ,Septicaemia ,Empyema necessitans

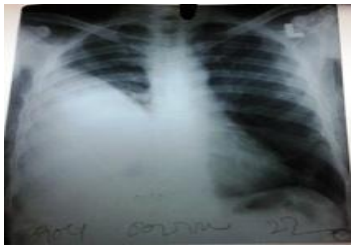
Chronic: Suppurative paricarditis ,Endocarditis, Myocarditis and Arthritis, Mediastinal abscess ,Thoracic deformity, Calcification in the pleural space, Amyloid disease, Metastatic cerebral abscess, Massive gangrene of chest wall .Anaemia.

Class	Type	Management
Class 1	Non-significant pleural effusion	Thoracocentesis not indicated
Class 2	Typical parapneumonic pleural effusion	Antibiotics alone
Class 3	Borderline complicated pleural effusion	Antibiotics plus serial Thoracocentesis
Class 4	Simple complicated pleural effusion	I.C.T.D plus Antibiotics
Class 5	Complex complicated pleural effusion	I.C.T.D plus Thrombolytics; rarely requires thoracoscopy or decortication
Class 6	Simple empyema	Tube thoracostomy with / without decortication
Class 7	Complex empyema	Tube thoracostomy with thrombolytics; ofter requires thoracoscopy or decortication

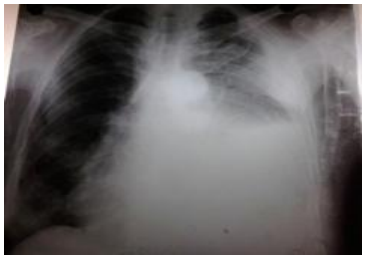
STUDY DESIGN

100 patients with diagnosis of empyema thoracis admitted in GGH Kakinada during the period between September 2012 to September 2014 were randomly selected for this study.

Investigations included CBP, chest X-ray, sputum for Gram's and AFB staining, and Culture sensitivity (Qualitative & Quantitative) for bacterial and Acid Fast Bacilli, Diagnostic aspiration of empyema was done and sent for culture and sensitivity . The clinical course and response of each patient was noted and the final surgical management was recorded.



RIGHT SIDED EMPYEMA



LEFT SIDED EMPYEMA

PRESENT STUDY DETAILS

Total number of cases studied ⟶ 100

Age Distribution

Table 1: Showing age distribution

Age Group (years)	Number of cases	Percentage
21-30	20	20
31-40	36	36
41-50	24	24
51-60	16	16
61-70	2	2
Total	100	100

In this study majority of cases were in the age group of 31-40 years (4th decade) constituting 36%,followed by the 41-50 year group constituting 24% .Together in 21-50 years age interval, 80% of the total patients have been diagnosed and treat

Sex Distribution

Table 2: Showing Sex distribution

Sex	Number of cases	Percentage
Males	86	86
Females	14	14
Total	100	100

In this study 86% of patients were male constituting the majority.

Symptoms

Table 3: Showing symptom analysis

Symptoms	Number of cases	Percentage
Cough	84	84
Fever	76	76
Chest pain	60	60
Dyspnoea	52	52
Sputum	40	40
Weight loss	40	40

In the present study the commonest presentation of empyema thoracis was cough (84%), followed by fever (76%), chest pain (60%), dyspnoea (52%), sputum production (40%) and weight loss (40%).

Microbiology

Table 4: Showing the microbiological organism cultured in the pleural aspirate

MicrobiologicalOrganism	Number of cases	Percentage
Staphyloccus	28	28
Streptococcus viridians	8	18
Pneumococcus	4	4
Klebsiella Pneumoniae	18	18
Pseudomanas	20	20
Esherichia coli	7	7
No growth	15	15
Total	100	100

Most common microbiological organism isolated was staphylococcus in 28 (28%) patients followed by Streptoccus viridians in 8 (8%), Pneumococcus in 4 (4%), Klebsiella pneumonia in 18 (18%), Psedomonas in 20 (20%), Escherichia coli-7% and were isolated individually in one such case each. In (15%) cases no organism could be grown.

Etiology

Table 5: Showing the etiology of empyema thoracis

Etiology	Number of cases	Percentage
Pneumonia	66	66%
Lung abscess	16	16
Tuberculosis	12	12
Post-thoracentesis	2	2
Post-exanthematous	2	2

The most common etiology was pneumonia (66%), followed by lung abscess in 16% and tuberculosis in 12%. There was 1 case of empyema thoracis caused by thoracentesis, I case of post-exanthematous fever and I case of trauma.

In this study various group s of antibiotics were studied about their efficacy depending upon their duration of time taken to get the complete resolution in the empyema thoracis patients

1. imepenam has shown that complete resolution after12 days and followed byoral antibiotics
2. sulbacef-for12 days followed by oral antibiotic-resolution after15days
3. tazobactem-piperacillin for 12 days-resolution at15 days
4. ceftrixone-for10 days-resolution after16 days
5. ceftaxim-for8 days plus oral antibiotics for 7 days-resolution at17days
6. amikacin+amoxy clav-7 days followed by-oral cipro-resloution at18 days
7. inj ciprofloxacin 100cc iv bd-10 days followed by oral tablets-resolution at 20 days
8. inj gentamicin –for 7 days-got-partial resolution ,,,again treated with higher antibioctic and discharged patint after resolution

The treatment of empyema thorcis includes inter coastal drainage procedure as mainstay of the

treatment;along with icd tube drainage various modalities werestudied.in this study .

ROLE OF ICT_IN TREATMENT OF EMPYEMA THORACIS

Table 8 Duration pf illness, before-ICT drainage and outcome

s.no	duration pf illness,before-doa-ICT	no patients	out come
1	1-5 days beforeICTdoa	19	excellent-reexpansion
2	6-10 days before ICT/ doa	21	good-reexpansion
3	11-15 days before ICT/doa	24	normal reexpansion
4	16-20 days before ICT/doa	8	delayed reexpansion
5	21-25days before ICT/doa	12	partial re expansion
6	26-30 days before ICT/doa	7	organized
7	31 -35 days before ICT/doa	5	refeer for decorticatione
8	36-40 days before ICT/doa	3	bpf-develoed
9	41-45 days before ICT/doa	2	expired after icd
10	more than 45 days	3	expier at admission

Role of ICT-this study has conducted on 100 patients.the duration of illness before icd tube has taken as the parameter in this study. it has shown that prolonged ill before icd tube gave poor results where early diagnosis and prompt intubation yielded excellent results-it has been established that early diagnosis and prompt intubation has bestout some when delayed intubation and delayed diagnosis yielded poor reults

Empyema thoracis –underlying dieases

Table 9: Role Of Underlying Diseases And Their Management

S.No	Underlying Disease	No Of Patients	Percentage	Management
1	Tubeculosis	38	38	Antiboitics,Ict,+Att
2	Hiv	24	24	Antibiotics,Ict+Art
3	Diabetes Mellitus	17	17	Antibiotics,Ict,Anti Hyperglycemics
4	Hypertension	8	8	Antibiotics,Ictand Anti Hypertensives
5	Anemia	13	13	Antibiotics,Ict,Iron Folic Acid Tab,/Blood Transfusion

The underlying disease in empyema thoracis was chiefly, tuberculosis, Hiv, Dibetesmellitus, Hypertension and anemia their management was very essential in decreasing the morbity of the disease. out of 100 cases tuberculosis is38% and hiv carries 24%-diabetes mellitus in 17% ..hypertension in 8% and anemia in 13%

Table 10: Role Of Treatment In Decreasing Mortality And Morbity

s.no	duration pf illness, beore-doa-icd	no patients	out come	MORTALITY
1	1-5 days beforei cd/doa	19	excellent-reexpansion	0
2	1-5 days beforei cd/doa	21	good-reexpansion	0
3	11-15 days before icd/doa	24	normal reexpansion	0
4	16-20 days before icd/doa	8	delayed reexpansion	20
5	21-25days before icd/doa	12	partial re expansion	28
6	26-30 days before icd/doa	7	organized	28
7	31 -35 days before icd/doa	5	refeer for decorticatione	45
8	36-40 days before icd/doa	3	bpf-develoed	70
9	41-45 days before icd/doa	2	expired after icd	100
10	more than 45 days			100

In this study delayed diagnosis may be due to delayed presentation due to neglect or poverty where as early diagnois and prompt IC tube intubation along with antibiotics has shown best results.

CONCLUSIONS

1. Empyema thoracis is difficult to manage but still presents as a challenge at referral tertiary care hospitals.
2. Co-morbid factors like Diabetes and immunosuppressive retroviral diseases may be implicated as the etiological reasons for the resurgence of Empyema in the present era of new and effective antibiotics.
3. High index of suspicion with Careful monitoring and pleural fluid aspiration of non-responding pneumonia and pleural effusion cases helps to identify cases of pyothorax at the earliest possible time.
4. Culture sensitivity based antibiotics and repeat culture tests will offer the best antibiotic choice.
5. Intercostal Tube Drainage with under water seal is the best and most effective method of management for its simplicity and specificity.
6. Major procedures of rib resections and open thoracotomies have been reduced due to Minimally invasive Thoracoscopic approach with improved rates in morbidity and moratality.

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