IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 6 Ver. X (June 2016), PP 30-33
www.iosrjournals.org

A Comprehensive Case Review Study of Diagnosis And Management of Empyema Thoracis in 200 Patient.

Ajay Solanki[1], R.K. Mathur[2], R.S. Raikwar[3], Abhay Brahamane[4], Varsha Dhakad[5],

[1]*Resident, Department of Surgery, MGM Medical college and M.Y. Hospital, Indore*
[2]*Professor & HOD, Department of Surgery, MGM Medical college and M.Y. Hospital, Indore*
[3]*Associate Prof. Department of Surgery, MGM Medical college and M.Y. Hospital, Indore*
[4]*Asst. prof. Department of Surgery, MGM Medical college and M.Y. Hospital, Indore*
[5]*Asst. Prof. Department of Surgery, MGM Medical college and M.Y. Hospital, Indore*

Abstract
Background*: Empyema thoracis is a disease that, despite centuries of study, still causes significant morbidity and mortality. Particularly In developing countries like India where tuberculosis is more prevalent.*
Aim*: The present study was undertaken to study the age-sex profile, symptomatology, microbiologic findings, etiology diagnosis, management and treatment outcome in a tertiary care hospital.*
Materials And Methods*: A prospective and retrospective study of empyema thoracis involved 200 patients admitted in teaching hospital.*
Results*: The peak age was in the range of 41-50years, the male-to-female ratio was 1.6:1.0 and the left pleura was more commonly affected than the right pleura. Etiology of empyema was tubercular in 28% cases and nontubercular in 72% cases. Gram-negative organisms were cultured in 28 cases (14%). Performing Intercostal chest tube drainage in 198 cases (99%) and more aggressive surgery was performed on 96 patients. Decortication had the best success rate(85.4%), followed by tube thoracostomy(80.03%). The average duration for which the chest tube was kept in the complete expansion cases was 11.4 days.*
Conclusion*: Tube thoracostomy should be done in all patients to reduce septic load of empyema thoracis with mild to moderate pus or have massive pyothorax radiologically should undergo the first line of management.. Open decortication is a safe procedure in experienced hands. In a developing country where access to expensive therapy like fibrinolytics and VATS is not freely*
available, decortication remains a valuable and indispensable tool. Recurrence of the disease is more signifantly affect the morbidity and mortality in the community.
Keywords*: Closed tube thoracostomy; empyema; decortications.*

I. Introduction

Empyema is a localized or free collection of purulent material in the pleural space as a result of combination of pleural dead space, culture medium of pleural fluid, and inoculation of bacteria. It is an advanced parapneumonic effusion. The most common bacteria implicated with postpneumonic, non-tubercular empyema are Staphylococcus aureus, Pneumococci, E. coli, Pseudomonas, Klebsiella, and anaerobes. The cultures are sterile in 30-50% of the cases due to antibiotics. Staphylococcus aureus is now the most commonly retrieved organism ([2, 3, 4]). The increasing incidence of methicillin-resistant Staphylococci reported from the developed countries has also been recognized in the Indian scenario ([5, 6]). Postoperative and post-traumatic empyemas may contain Bacteroides or Pseudomonas aeruginosa ([1].). While most cases would respond to antibiotic therapy, needle aspiration and intercostal drainage, few cases require further surgical management. The most common non-tubercular etiological agent is Staphylococcus. Tubercular etiology is not uncommon in India, especially due to delayed presentation, multiresistant strains, mismanaged cases, and non-compliance with antitubercular treatment amidst malnutrition and anemia. Clinical symptoms and a skiagram of the chest followed by thoracentesis are enough for diagnosis. Pleural fluid is usually diagnostic and helps in choosing the appropriate antibiotics. Further investigations and management depends on the stage of the disease Thoracoscopic debridement and thoracoscopic decortication are alternatives with distinct advantages over thoracotmy and are indicated if there was no response with intercostal drainage. In the organizing stage, a thoracotomy (for decortication) would be required if there is loculated empyema, underlying lung disease or persistently symptomatic effusion ([11]). Timely institution of proper management prevents the need for any surgical intervention and avoids long-term morbid complications.

II. Patients And Methods

The Present study consists of 200 Patients of age group 12 to 60 year diagnosed as a Empyema thoracis Between January 2010 to October 2015 in M.Y. Hospitial Indore (M.P.)

III. Methods

The study was conducted in department of Surgery, M.G.M. Medical College & M. Y. Hospital Indore from Jan 2010 to October 2015. Ethical committee clearance was taken for the study. Retrospective data of patients, who underwent tube thoracostomy and decortications in the department of surgery. This study is a prospective and retrospective study in which the diagnosis of post-pneumonic or tubercular empyema was made using clinical records review and examination and investigations like chest X-ray, chest ultrasonography, and CT scan of the chest. Treatment included closed tube drainage, thoracotomy with decortication and/or lobectomy/pneumonectomy. Tube thoracostomy was done immediately as early as possible after diagnosis. Successful closed tube drainage was evidenced by improvement in clinical and radiological status within 24 to 48 hours. Continuous drainage was maintained until daily fluid output dropped to below 30ml and/or improvement in the chest radiograph was noted. The chest tube was removed when lung expansion was seen on X-ray. Decortication was performed if there was a stage III empyema (organized stage), and if patients did not improve after tube thoracostomy. More extensive surgical procedures such as lobectomy/pneumonectomy were done if the lung was non-viable. As a routine, antibiotic cover was given as part of the treatment protocol to all patients.

Patients information including name, age, sex, weight, diagnosis, date and time of operation were recorded in predesigned proforma. Also noted were;

- Duration of tube thoracostomy drainage subsides
- Post decortications improvement of patient with ICD content (in consistency and amount).
- Postoperative length of hospital stay.
- Complications (wound infection and dehiscence,
-

Age distribution (paediatric age group below 12 years are not included in our study

Age group	No. of patient (n=200)	Percentage
<20	10	5
21-30	36	18
31-40	49	24.5
41-50	55	27.5
51-60	47	23.5
>60	03	1.5
total	200	100

Sex distribution

Sex	Total no. of patient (n=200)	Percentage
Male	125	62.5
Female	75	37.5
total	200	100

Symptomatology

Clinical presentation or symptoms	Total no of patient (n=200)	percentage
fever	176	88
cough	168	84
Breathlessness	160	80
Chest pain	136	68
Weight loss	20	10
Hemoptysis	20	10
Pain abdomain	12	06
Lympadenopathy	02	01
asymptomatic	24	12

Treatment modalities

Procedures	Total No of patient (n=200)	Percentage %	Success(%)
Tube thoracostomy	198	99	159(80.03)
Decortications	96	48	82(85.4)
Video assisted thoracoscopic surgery (VATS)	10	05	10(100)
Pneumonectomy	02	01	02(100)

Recurrence of symptoms

procedure	Tubercular	Non-tubercular	Total (n=12)	percentage
Total no of patient	07	05	12	6 %
Post tube thoracostomy	07	05	12	6 %
Post decortication	03	02	05	2.5 %
VATS	04	03	07	3.5%
Pneumonectomy	00	00	00	00%

IV. Results

The study period was 58 month with total 200 patient were involved. In our study Total 200 cases of Age range =15-70 years. Peak age group 41-50year (27.5%). Least affected age group are above 60 years of age. Male are preominently affected with M:F ratio 1.6:1. Most of the patients belongs to the middle to lower socio-economic group. Involvement of left chest is comparatively more than right side. in our study Most common presentation was found fever in 176 patients (88%) followed by Fever in 168 Patients (84) and Resp. distress in 160 patients (80%) In pus culture 56 Patients (28%) were found sterile, Isolated most common organism was Staphylococcus 64(32%) followed by streptococcus 36(18%), E. Coli 14(7%), Klebsiella 4(2%), Pseudomonas 4(2%), Mixed organism 16(8%). In 56 (28%) were of tubercular etiology and 144 (72%) were of non- tubercular etiology. Out of total 56 cases , Sputum AFB positive 25 cases (44.6%) and negative 09 cases (16 %) are started ATT on standard DOTS regime.

31 Cases (15.5%) are already on the ATT with mean duration of taking the ATT is 5.85 month. Majority of (17 cases, 30.8 %) belongs to the relatively middle age group (41-50 years), whereas 26.3 %(38 cases)of nontubercular empyema patient belonged to above 45 years of age. Mean age in the tubercular empyema group was 39 years (range 17-64) compared to mean age of 38.2 years (range 17-70 years) in non-tubercular empyema **.** In patient with illness more than 1 month duration , we have 42 (75%)cases of tubercular and 60 (41.6%)cases of non-tubercular empyema.

Tube Thoracostomy was done in 198 Patients (99%),Decortication in 96 Patients (48%), VATS in 10 patient(5%), Pneumonectomy in 2 Patient (1%) Of the commonly used procedure, Decortication had the best success rate(85.4%), followed by tube thoracostomy(80.03%). Recurrence rate is more in VATS(58.3%) with the mean follow up period of 4 month after the primary surgical intervention as compare to the post decortications(41.6%) with mean age of follow up is 4.6 month.

Post-operatively antibiotics were giving in all patients (100%), ATT in 56 Patient (28%), We found that tube thoracostomy should be done in all patients regardless of the stage as this leads to a reduction in septic load. Chest tube drainage in parapneumonic empyema is safe and efficacious and long-term outcome is comparable to primary surgical drainage in most of the cases.

V. Discussion

Decreasing in number of empyema in our study at present institute may be attributed by

- Increasing the awareness of health related problem
- Increasing awareness of the tuberculosis under the National health programme; RNTCP
- Increasing the primary health centre to catch the illness at the earlier

In our study of 200 cases of empyema thoracis We exclude the peadiatric age group below 12 year of age from our study.

Our study is similar to the study[1] show the peak age was in the range of 21-40 years, the male-to-female ratio was 3.4:1.0 and the left pleura was more commonly affected than the right pleura. similar study[2,3]. In our study, maximum patient present are of age group 41-50 years TOTAL 55 cases(27.5%) Age range = 15-70 years. In our study, out of total 200 cases, 125 male(62.5%)and female 75 (37.5%) male are preominently affected with empyema thoracis male female ratio in our study is 1.6:1.0 as showing older age group(41-50 years) of empyema patients as compare to other study of younger peak age group (1,2). The left pleura was more commonly affected than the right[4]. Our study show lower incidence of empyema(54%) in lower socio-economic class[3] (59, **83.09%**), were from the poor socioeconomic class.

Most common presentation of empyema thoracis patient in our study was fever (88 %) followed by cough (84%) . Least presentation of the patient in our study with the cervical lympadenopathy, though tuberculosis is the most common infection in India. 24 cases (12 %) have no symptoms attributed to the empyema thoracis at admission. These are diagnosed by the routine chest x-ray and ultrasonography of chest. Our study observation is found similar to other studies[1,2,5].out of 200 patient 56 (28%) were of tubercular etiology and 144 (72%) were of non- tubercular etiology [(Gram positive culture in 100 cases (50 %) and gram negative 28 cases (14 %). Mixed infection present in 14 cases (07%)]. Staphylococcus aureus is the most common organism isolated in the non- tubercular empyema patient 56 cases (44.4%) followed by the streptococcus pneumoniae 36 cases(25%). Out of total 56 cases , Sputum AFB positive 25 cases (44.6%) and

negative 09 cases (16 %) are started ATT on standard DOTS regime. These observation finding are weighted against the study done already on empyema thoracis micro-organism isolated from the pleural pus culture show opposite to our observation[6,7,8] also shows that *Streptococcus pneumoniae* is the most common etiological cause of empyema and same In the study[4] shows Staphylococcus aureus is the commonest pyogenic organism. Empyema thoracis: A clinical study[1] Past history of tuberculosis was available in 18 patients (36while mycobacteria was cultured in 6 (15%) and staphylococcus in 5 (12.5%). In 22 patients (55%), the pus was sterile. Sputum was positive for AFB in 10 patients (25%)of the current series. AFB was identified in the empyema fluid by ZN stain in 12 patients (30%). Culture for AFB was positive in 6 patients (15%)

The overall mortality rate of study is 18% is also similar to the study of(Jess P, Brynitz S, Friis Møller A.et al)[9] Out of the 200 patient of empyema thoracis during study, 99 % (198cases) were undergo the first intervention as tube thoracostomy... The no. of tube thoracostomy done in subsequent year are in the decreasing trends as the empyema thoracis patient are managed conservatively by better antibiotics and early diagnosis and treatment of the disease. Tube thoracostomy is followed by decortications in chronic empyema thoracis patient already on ATT or patient having massive pyothorax and the collection of tube thoracostomy is not subside even after 1 week of interval Of the commonly used procedure, Decortication had the best success rate(85.4%), followed by tube thoracostomy(80.03%) Results of our study are comapare to different already done study on empyema thoracis pertaining to the tube thoracostomy and decortications and the success rate of both the procedure is similar to the other studies[2,5,10] Recurrence of their symptoms in the follow up period is notice in total of 12 cases(6%). No recurrence is shown in the empyema thoracis patient treated by the pneumonectomy, this procedure is preserved to the patient having concomitantly carcinoma lung. In our study it is done in only 1% cases Recurrence is more in the patient undergoing VATS, particularly in the tubercular empyema patient. Recurrence rate is more in VATS(58.3%) with the mean follow up period of 4 month after the primary surgical intervention as compare to the post decortications(41.6%) with mean age of follow up is 4.6 month.

VI. Conclusion

despite good available antibiotics, proper and timely referral, various modalities of treatment available, empyema thoracis remain a problem in the developing countries like India. It cause economic burden to the family involved and use the resource, still cause morbidity and mortality in our community. Future studies will may illustrate its prevention.

References

[1]. Acharya PR1, Shah KVEmpyema thoracis: a clinical study. Ann Thorac Med. 2007 Jan;2(1):14-7. doi: 10.4103/1817-1737.30356.
[2]. Bilal A, Shah S A. Presentation and management of Empyema Thoracis at Lady Reading Hospital Peshawar. J Ayub Med Coll Abbottabad 2004;16(1):14–7.
[3]. Salma Ghaffar, Ishtiaq Ali Khan, Sadia Asif, Zia ur Rahman EMPYEMA THORACIS: MANAGEMENT OUTCOME,J Ayub Med Coll, Abbottabad2010;22
[4]. SA Edaigbini1, IZ Delia1, MB Aminu1, N Anumenechi1, SS Audu[2] Empyema thoracis in Zaria; A preliminary report Year : 2011 | Volume : 17 | Issue : 2 | Page : 82-86
[5]. Empyema Thoracis* Therapeutic Management and Outcome Gregory P. LeMense, MD; Charlie Strange, MD, FCCP; andSteven A. Sahn, MD, FCCP Chest/107/6/JUNE 1995
[6]. Ferguson AD, Prescott RJ, Selkon JB, Watson D, Swinburn CR. Empyema subcommittee of the Research Committee of the British Thoracic Society. The clinical course and management of thoracic empyema. Q J Med. 1996;89:285–9. [PubMed
[7]. Steve A. Sahn Diagnosis and Management of ParapneumonicEffusionsand Empyema clinical Infectious Diseases 2007;45:1480-6.
[8]. Distribution of Streptococcus pneumonia Serotypes That Cause Parapneumonic Empyema in Turkey [Mehmet Ceyhan et al]CVI P-972-976 July2013 vol-20.
[9]. Jess P, Brynitz S, Friis Møller A. Mortality in thoracic empyema. Scand J Thorac Cardiovasc Surg. 1984;18(1):85-7.
[10]. Vardhan MV, Tewari SC, Prasad BN, Nikumb SK. Empyema thoracis- study of present day clinical and etiological profile and management techniques. Ind J Tub. 1998;45:155–60